

# MicroMax

## M-Max Systems

for Mission Critical Applications



**Tough Computers for Tough Challenges!**

## M-Max Customized Solutions

MicroMax Computer Intelligence was founded in 1979 and maintains corporate headquarters in New York City. MicroMax is an engineering company, designing specialized computer systems for mission critical applications, with a client base that includes the transportation industry (rail, marine and air), various industrial and manufacturing enterprises as well as financial and federal and municipal agencies.

MicroMax supports each client's needs by taking a customized approach to optimize each of its industrial computers. Our M-Max systems are excellent for harsh scenarios, limited-sheltered outdoor applications in heat and cold, and tough industrial environments with dust, dirt, and other contaminants being a factor.

## M-Max Systems & Options

### Range of systems



### Available options

Quad Core <b>ARM</b> LP Platform	Quad Core <b>Celeron</b> GX Platform	Quad/Dual Core <b>Atom</b> PR7 Platform	Dual Core <b>i3</b> AR Platform	Dual Core <b>i7</b> DT Platform	Quad Core <b>i7 / i5</b> EP4 Platform	GeForce & <b>Xeon</b> CU Platform
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## Building Blocks for Your Systems

Available options	Systems								
	Platforms	Versions	M-Max PD 2	M-Max PD 7	M-Max VT	M-Max ATR	M-Max HR 1U	M-Max HR 3U	M-Max VI
<b>CU</b>	Xeon E3-1505L V5					•		•	
<b>EP4</b>	Quad Core i7-6822EQ			•	•			•	
	Quad Core i5-6442EQ			•	•			•	•
<b>DT</b>	Dual Core i7-6600U				•	•	•	•	
<b>AR</b>	Dual Core i3-6100E / i3-6102E			•	•			•	
<b>PR7</b>	Quad Core Atom E3845 / Dual Core Atom E3826		•	•	•	•	•	•	•
<b>GX</b>	Quad Core Celeron N3160						•	•	
<b>LP</b>	Quad Core ARM i.MX6	•					•		

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**M-Max VI PR7**

The **M-Max VI PR7 (M-Max 771 PR7)** is a Quad Core rugged industrial computer with data acquisition features for tough environments. The enclosure is designed according to the VITA 75 footprint and can be mounted on different vehicle types. The lightweight compact sealed case with fanless heat dissipation resists contamination and humidity. The system has been certified to comply with MIL-STD-810G and airborne MIL-STD-704F. The system is expandable by one mPCIe module and one PCI/104 Plus board.

- Certified to comply with **MIL-STD-704F** and **MIL-STD-810G**
- Operating temperature from **-40 to +70 °C**
- **IP66** rated dust and moisture protection
- Shock handling up to **40g**, Vibration up to **2.5g**
- **16x digital programmable I/O lines**
- **Optional:** 16x 16-bit analog inputs, 250 KHz max sample rate; 4x 16-bit analog outputs; 6x additional DIO lines



**M-Max SW216 & SW21X/PS**

The MicroMax family of Rugged Switches, comprised of the **M-Max SW216** and **SW21X/PS**, is a lineup of ruggedized Gigabit Ethernet Layer 2+ Managed Switches providing reliable operation in tough environments. Their rugged enclosures are designed according to the VITA75 footprint. The M-Max SW216 offers 16x Gigabit Ethernet ports. The M-Max SW21X/PS can be equipped with either 12x, 14x or 16x Gigabit Ethernet ports. The M-Max SW21X/PS is in compliance with MIL-STD-810G and MIL-STD-461F and its embedded power supply is in compliance with MIL-STD-704F and MIL-STD-1275D.

- **Built-in microcontroller** with software supporting host interface and management through web interface
- **IP66** rated dust and moisture protection
- Operating temperature from **-40 to +75 °C**
- Wide power supply voltage input from **+5 to +34 V DC** or +28 V DC (complies with **MIL-STD-704F, MIL-STD-1275D**)
- **Extended salty fog protection** (available upon request)



**M-Max 720 PR7 & M-Max B00**

The **M-Max 720 PR7** is a high performance battery powered rugged computer system for mission-critical applications. The system is designed to operate in extremely harsh environments and is equipped with: GPS module, 900 MHz Radio modem, 48x Isolated Digital I/O interfaces, four functional LEDs, expanded set of RS-232/485, USB 2.0, VGA and Gigabit Ethernet ports. The system's LiFePO4-battery based UPS provides 10 hours of backup power and supports an online connection to the optional **M-Max B00** external Rugged Battery unit.

- Integrated and External **LiFePO4** batteries
- **Hot swappable** external battery unit
- **20+ hours of backup** power at **100% CPU** load
- **18 W** power consumption
- Shock handling up to **10g**, Vibration up to **2g**
- Data storage based on **industrial grade SSDs**
- Operating Temperature (using the power of installed batteries) from **-20 to +65 °C**



**M-Max VT AR/TRN-02**

The **M-Max VT AR/TRN-02** is a high-performance rugged industrial computer for demanding and critical applications requiring performance comparable to desktop systems. The system is IP66 rated and can withstand shocks of up to 40g and vibration of up to 6g. The M-Max VT AR/TRN-02 is configured with Intel Core i3 1.9 GHz CPU and Intel HD 530 video, with hardware video decoding. The M-Max 800 AR/TRN-02 has 5x LAN Gigabit Ethernet, 1x RS-232 and 3x USB 2.0 ports. Data storage options include vibration proof industrial SSDs with RAID functionality (software or hardware option).

- Complies with **MIL-STD-810G** specifications
- Operating temperature from **-40 to +65 °C**
- Shock handling up to **40g**, Vibration up to **6g**
- **IP66** rated dust and moisture protection
- High performance system, Intel **Core i3** based
- **Optional:** 28VDC input compliant with **MIL-STD-704F, MIL-STD-461F**



**M-Max ATR 12 EP4**

The **M-Max ATR 12 EP4 (M-Max 810 EP4)** is a rugged industrial computer with the highest performance currently available for systems with passive cooling. It is designed to provide reliable operation in harsh environments. The fully-ruggedized ATR-type aluminum chassis is fanless and utilizes natural convection and conduction cooling in accordance with MIL-STD-810 standards. The sealed enclosure of the ATR-system is designed specifically for PC/104 form-factor boards.

- Complies with **MIL-STD-810G** specifications
- Operating temperature from **-40 to +60 °C**
- Shock handling up to **40g**, Vibration up to **2.5g**
- **IP66** rated dust and moisture protection
- High performance system, Intel **Quad Core i7** based
- **Optional:** 28VDC input compliant with **MIL-STD-704F, MIL-STD-461F**



**M-Max 400 RC**

The **M-Max 400 RC** is a highly reliable compact rugged computer for building all-electric interlocking distributed systems. The system is designed for converting CAN-interface control signals into relay control signals of railroad automation systems. It uses '2 out of 2' architecture for higher reliability of control signals. Two autonomous identical computers inside the system are connected by internal interfaces. Each computer has an independent power input and an internal uninterruptible power supply (UPS) based on ultracapacitors, ensuring up to 12 seconds of operation with the input power cut off. Depending on configuration the system allows to maintain 12 or 24 relays.

- **'2 out of 2'** architectures
- **12s run on internal UPS** based on ultracapacitors
- Operating temperature from **-40 to +70 °C**
- Shock handling up to **40g**, Vibration up to **6g**



**M-Max HR 3U CU**

The **M-Max HR 3U CU (M-Max 950 CU)** high-performance rugged industrial computer provides reliable operation in tough environments. The fully-ruggedized 19/2"-type aluminum chassis is fanless and uses natural convection and conduction cooling in accordance with MIL-STD-810 standards. COTS technology components enable configuring the M-Max HR 3U family to comply with a wide variety of airborne, marine and ground vehicle applications.

Delivering outstanding performance comparable to high-end desktop systems, the 950 also features extended graphics capabilities, providing up to 6x HDMI outputs.

- High performance **Intel Xeon E3-1505L V5**, 2.0-2.8 GHz
- **19/2"-type** chassis with a variety of mounting options
- **IP66** rated dust and moisture protection
- Shock handling up to **40g**, Vibration up to **2.5g**
- High performance graphics with **GeForce GTX 1050Ti** controller
- **Optional:** 100W power supply (28VDC) compliant with **MIL-STD-704F, MIL-STD-461F**

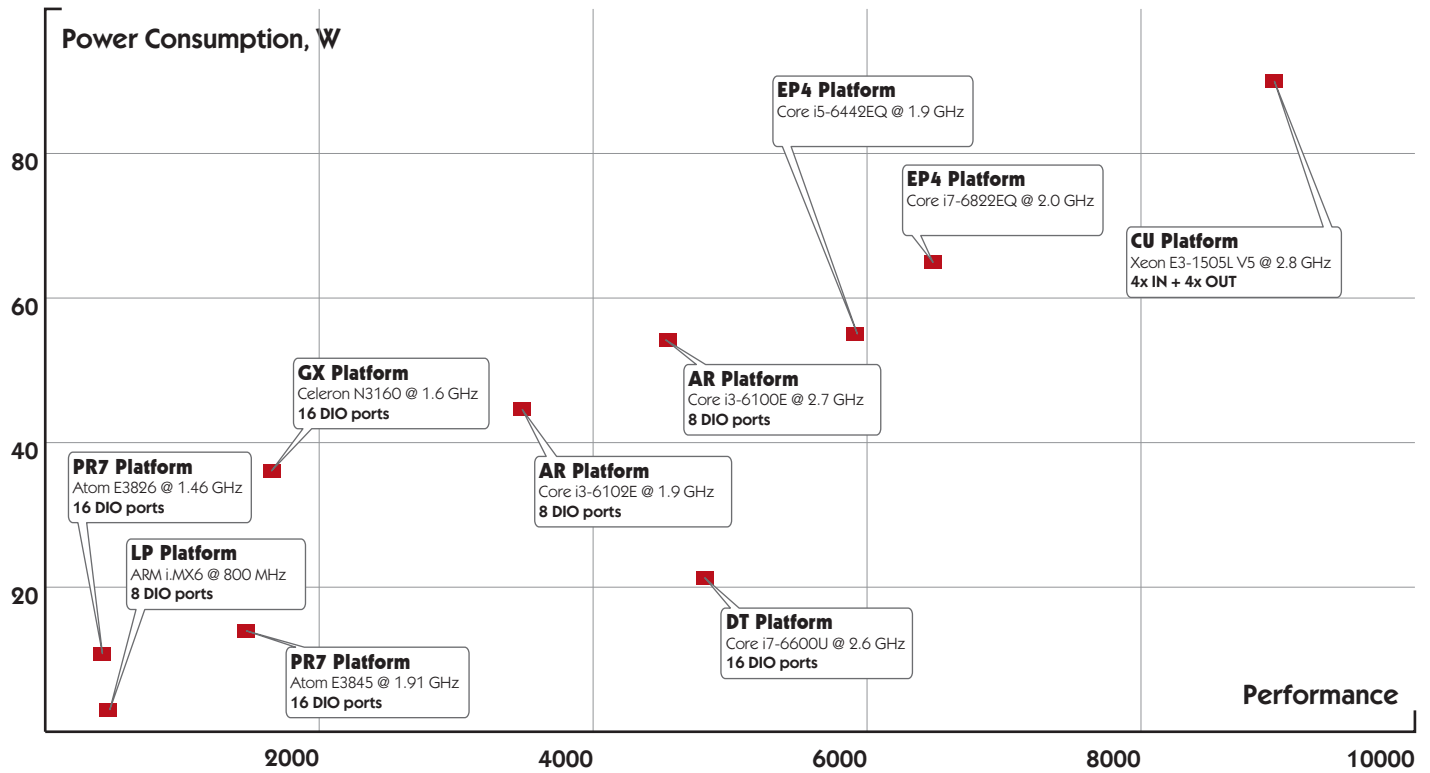


**M-Max HR 1U DT**

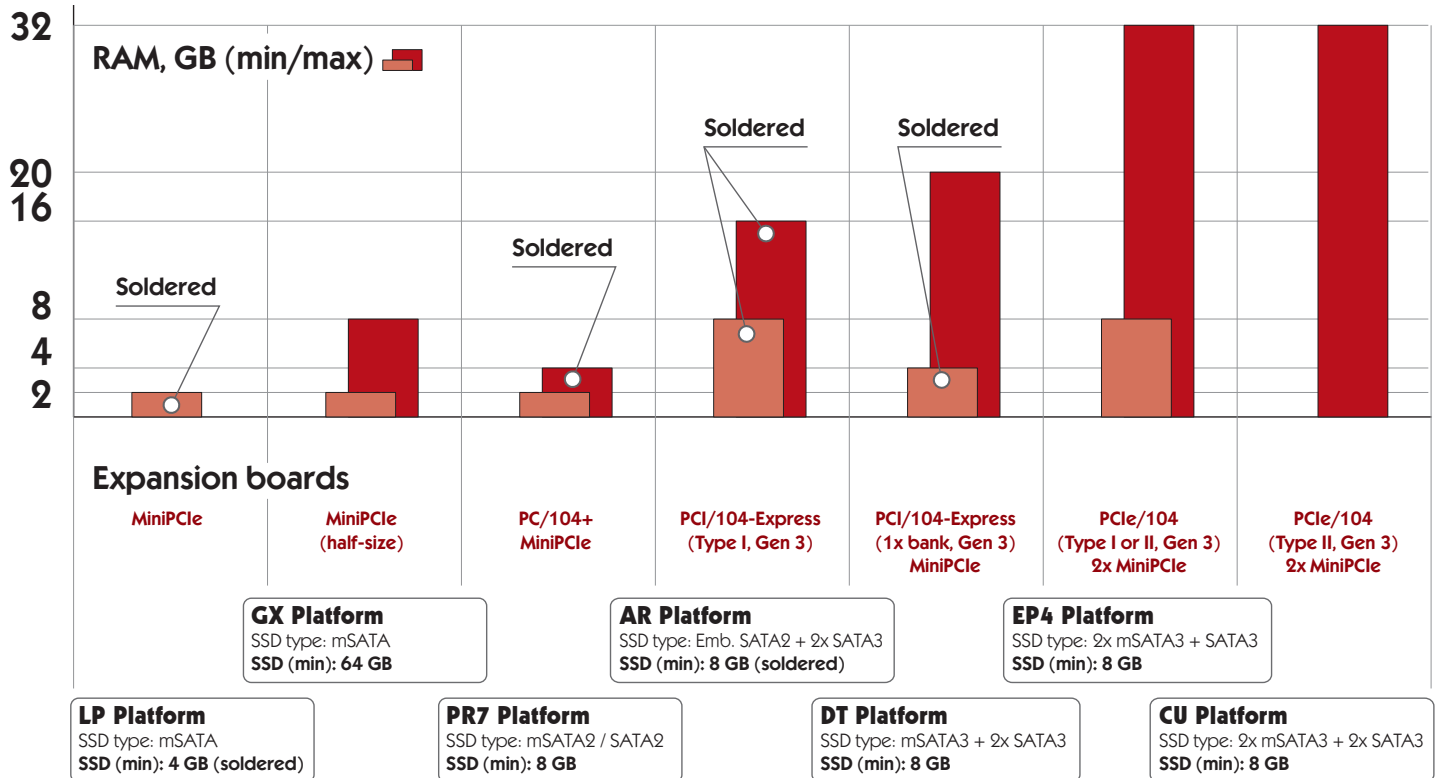
The **M-Max HR 1U DT (M-Max 851 DT)** is a compact high-performance rugged computer based on Dual Core i7 CPU. The fully-ruggedized 19/2"-type aluminum chassis is fanless and uses natural convection and conduction cooling in accordance with MIL-STD-810 standards. Versatile mechanical design of the enclosure allows combining several systems into one assembly either side by side or by stacking, mount on a flat surface or into a 19" rack using appropriate mounting parts.

- High performance **Intel i7-6600U**, 2.6 GHz
- **19/2"-type** chassis with a variety of mounting options
- Operating temperature from **-40 to +70 °C**
- **IP66** rated dust and moisture protection
- Shock handling up to **40g**, Vibration up to **2.5g**
- **Optional:** 28VDC input compliant with **MIL-STD-704F, MIL-STD-461F**

## Consumption vs Performance



## Expandability Chart



**Tough Computers for Tough Challenges!**

## M-Max Options

Platform	LP	GX	PR7	AR	DT	EP4	CU
<b>Parameter</b>	<b>LP</b>	<b>GX</b>	<b>PR7</b>	<b>AR</b>	<b>DT</b>	<b>EP4</b>	<b>CU</b>
CPU	ARM i.MX6	Celeron N3160	Atom E3826 / E3845	i3-6102E / i3-6100E	i7-6600U	i5-6442EQ / i7-6822EQ	Xeon E3-1505L V5
CPU frequency	800 MHz	1.6–2.24 GHz	1.46 / 1.91 GHz	1.9 GHz / 2.7 GHz	2.6 GHz	1.9–2.7 GHz / 2.0–2.8 GHz	2.0 GHz–2.8 GHz
Cores / Threads	4 / 4	4 / 4	2 / 2 / 4 / 4	2 / 4	2 / 4	4 / 4 / 4 / 8	4 / 8
RAM (min / max)	2 GB (soldered)	2 / 8 GB	2 / 4 GB (soldered)	8 / 16 GB (soldered)	4 (soldered) / 20 GB	8 / 32 GB	32 GB
GPU	Vivante GC9000	HD Graphics	HD 7 <sup>th</sup> Gen.	HD 530	HD 520	HD 530	GeForce GTX 1050Ti
GPU frequency	–	320–640 MHz	533–667 / 542–792 MHz	0.35–0.95 GHz	0.3–1.0 GHz	0.35–1.0 GHz	1.392 GHz
SSD (min)	4 GB (soldered)	64 GB	8 GB	8 / 32 GB (soldered)	8 GB	8 GB	8 GB
SSD type	mSATA	mSATA	mSATA2 + SATA2	Emb. SATA2 + 2x SATA3	mSATA3 + 2x SATA3	2x mSATA3 + SATA3	2x mSATA3 + 2x SATA3
<b>Interfaces</b>							
Video	VGA + HDMI	VGA	VGA + HDMI / DP	DP + HDMI	VGA + HDMI	2x HDMI / DP / DVI	6x HDMI / DP / DVI
Audio	2x IN + 2x OUT + 1x Mic	1x Mic + 1x OUT	2x IN + 2x OUT + 1x Mic	–	2x IN + 2x OUT + 1x Mic	2x HP + 2x Mic	2x HP + 2x Mic
GbE / Fast Ethernet	1 / –	2 / –	2 / –	2 / –	2 / –	2 / –	2 / –
USB 2.0/3.x	4 / –	4 / –	2 / 1	4 / 1	2 / 4	– / 4	2 / 4
RS-232	2 (lim.)	4	–	2	–	–	2
RS-232/485	2	2	4 (lim.)	–	4 (lim.)	2 (lim.)	2 (RS-485)
PS/2 (kb, mouse)	–	–	–	–	–	–	–
DIO	8	16	16	8	16	–	4x IN + 4x OUT

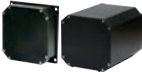




### Environmental and physical specifications

Operating temp. (optional)	-40...+70 °C	-20...+50 °C	-40...+70 °C	-20...+60 °C (-40...+65 °C)	-40...+70 °C	-20...+55 °C (-40...+60 °C)	-40...+50 °C
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### Miscellaneous

Power consumption	3 W	36 W	11 W / 14 W	45 W / 55 W	21 W	55 W / 65 W	90 W
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## M-Max Enclosures

Enclosure					
<b>Parameter</b>	<b>Pandora</b>	<b>VersaTainer</b>	<b>ATR</b> 1/2 Short / 3/8 Short	<b>19/2"</b> 1U / 3U	<b>VITA 75 Compliant</b>
Versions	1.7", 3", 5", 7", 10"	4", 6", 8", 10", 12", Custom length up to 48"	Custom versions on request	Custom versions on request	–
Max Heat dissipation, W	10 (1.7") / 30 (7")	60 (8")	95 / 90	30 / 90	55
Weight, kg	from 0.2* (1.7") to 1.2* (10")	from 1.2 (4"), to 3.2 (12")	6 / 5	2.3 / 4.5	2.5
Weight, lbs	from 0.45* (1.7") to 2.65* (10")	from 2.78 (4"), to 7.01 (12")	13.2 / 11	5.07 / 9.92	5.51
Dimensions* (W x H x L), mm	145 x 138 x 43 – 254	180.34 x 144.78 x 119 – 322.2	124 x 196.6 x 354.9 / 90.4 x 196.6 x 354.9	220 x 44 x 280 / 220 x 132 x 280	284.48 x 57.8 x 188
Dimensions* (W x H x L), in	5.75 x 5.5 x 1.7 – 10	7.1 x 5.7 x 4.69 – 12.69	4.88 x 7.74 x 13.97 / 3.56 x 7.74 x 13.97	8.66 x 1.7 x 11.02 / 8.66 x 5.19 x 11.02	11.2 x 2.28 x 7.4

### Environmental and physical specifications for typical system

Dust/Moisture	IP65 or IP66				
Vibration	2.5g	6g	2.5g	2.5g	2.5g
Shock	40g	75g	40g	40g	40g

\* without endcaps, screws and gaskets