Complete PCI Embedded system
Network controlling, measuring and data acquisition

MSX-BOX-500

(Measurement Solution Extended-Box)

Scalable and open system

Integration of standard components

Communication standard through Ethernet or RS232 ...

CAN, Profibus, Interbus, ...

Embedded webserver

Real-time Embedded RTAI Linux

Licence free - Open Source

The basis of standard technologies represents much more than just a philosophy or marketing formula as the use of open standards is intended at all hardware and software levels
From the CPU and backplane through the operating system, programming environment and communication technology, to operating and visualisation methods, open standards are used.
The range stretches from compact mini-systems with no hard disk to powerful process computers.
Although it features standard components like PCI backplane, PCI I/O boards and controller board, the MSX-Box is run without expandable parts like hard disk, drive, ventilator or keyboard.
The development of the controller board (MIPS 64-bit processor) was focussed on the long-term availability of the components likewise the PCI I/O boards of ADDI-DATA. Herewith the long-life delivery of the product is ensured.
The MSX-Box is based on an open system which enables to insert any PCI measurement board available on the market.
In the standard design the box is fitted with 5 PC slots as well as an additional bracket opening for future interface enlargement. 2 of these slots are used for the controller board and the Ethernet board.

Features

- Fan-free PCI controller, 64-bit MIPs processor, 200 MHz, 16 MB Flash, 128 SDRAM
- Installed operating system: Real-time embedded RTAI Linux
- „Floating Point" calculation directy in RTAI kernel.
- Most of the commercially available standard PCI measuring boards with Linux drivers can be inserted (Open source code required for Cross-Compiling and data transfer to the MSX-Box)
- 3 free PCI slots
- Network connection through Ethernet (RJ45), 10/100 MBits
- Additional communication optional: CAN, Profibus, Interbus, RS485/RS232; optical isolation
- Status indicator through LEDs
- Compact design (L x H x W): 275 x 176 x 160 mm
- Heat dissipation through convection

Safety measures

- By using standard and proven technologies, e.g. RISC technology for the CPU, a long-term availability is ensured.
- Mains supply: protected against short-circuit, overload and overvoltage
- PCI board fixation with robust board-holding clamp (optional)

Communication

- Data exchange with other systems occurs through Ethernet (TCP/IP) and/or RS485/RS232 interface (option)
- Allocation of an IP address. The MSX-Box can be accessed through the present firm network with TCP/IP (e.g. Internet browser, TCP/IP-Client, ...).
- System monitoring through Ethernet and/or RS232.
- Optional connection or communication possible through Profibus, Interbus, CAN as well as RS485 or RS232.

Mounting possibilities (optional)

- DIN rail
- Wall mounting
- Carrying handle

Applications

- Measurement and control applications
- Machine control
- Industrial automation processes
- Automatic test equipment
- Multichannel data acquisition
- Axis control
- Data logger
- ...

Current information on the web: www.addi-data.com

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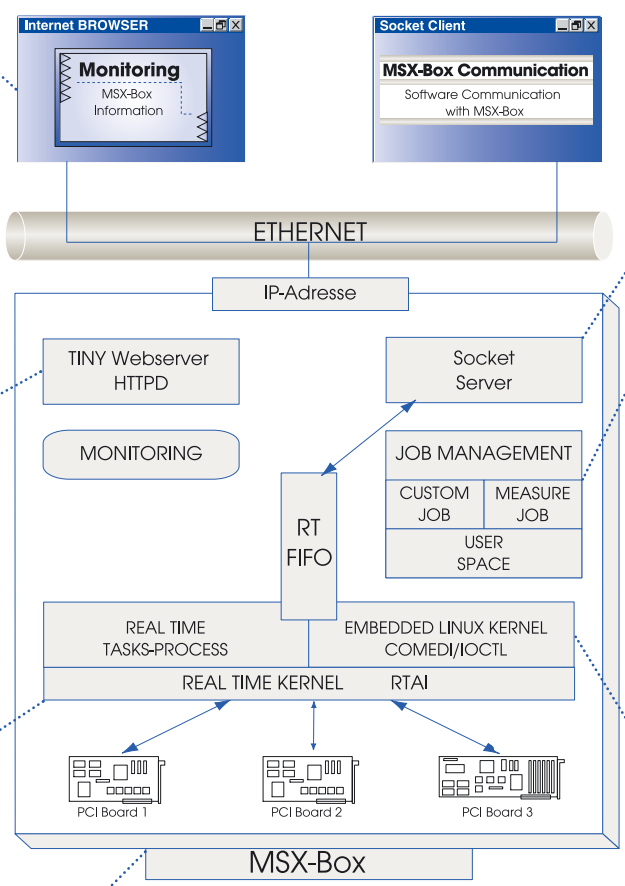
Complete PCI Embedded system
Standard software technologies

The software concept:

Monitoring & Visualisation through Internet technology:
HTML data and CGI programs are delivered with the MSX-Box, as well as a distribution CD (including source code). They are used as examples to create a user interface on the basis of a Web front-end.
You can see how input signals are displayed in a web browser and how output signals are set.

The "thttpd" Daemon is an embedded webserver with which the HTML pages and CGI programs can be installed on the MSX-Box. It supplies a user interface, the web front-end and can be accessed through network with an Internet
browser thank to the IP address of the MSX-Box.

Real time embedded RTAI kernel:
The Linux version 2.4.2.x is installed in compact form. The operating system requires 6 MB.
The installed „Journaling Flash File System" enables to record the write/read commands. Thus even if the MSX-Box is switched off or on, no data is lost.



Socket Server:
A TCP/IP server socket, the "Command Manager" can be installed on a port of the MSX-Box so that a TCP/IP Client Socket installed in the network can send or receive information from the MSX-Box.
On the Distribution CD you will find an example of socket server.

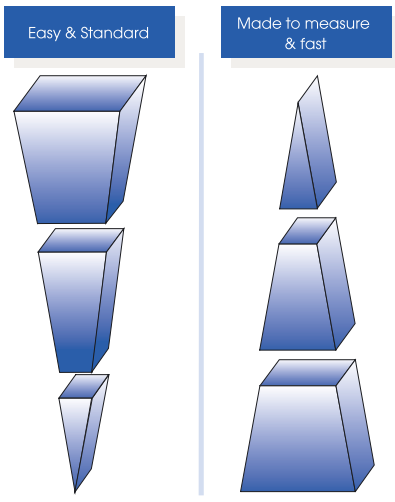
Jobs:
When the "Measure Job" is set, the MSX-Box can be used as data logger. A basic application is delivered in source code. It can set e.g. one APCI-3120 (analog inputs) and one APCI-1500 (digital inputs). On this basis you can program your own measure jobs.

COMEDI/IOCTL:
COMEDI, the "Control and Measurement Devices Interface", enables to access any input/output board in a uniform way.
IOCTL drivers are also supported once they have been compiled with the Cross Compiler.

Open Source
Avoids unsollicited periodical application import and operating system updates by using open-source technologies.

Principle of an open system:

There is a software solution for each user
By programming you will always find the right and easy solution which fits perfectly your application. To this purpose the MSX-Box can be called up according to 3 software models.
Decide yourself which model corresponds to your application:



Model 1
Parameterising with web front-end

Easy standard measuring applications realised without programming!
You access the so-called "Measure Jobs" of the MSX-Box. These can be only be parameterised, started and stopped.
The contained commands are then carried out by the MSX-Box.

Model 2
Framework: Internet programming & C programming

No new development:
With the help of the delivered software framework you can develop your own „Custom Job".

Model 3
C programming

Adapt you MSX-Box to your application at 100%:
The installed real time operating system, embedded RTAI Linux, and the open source codes allow you to build a made-to-measure and complete software application.

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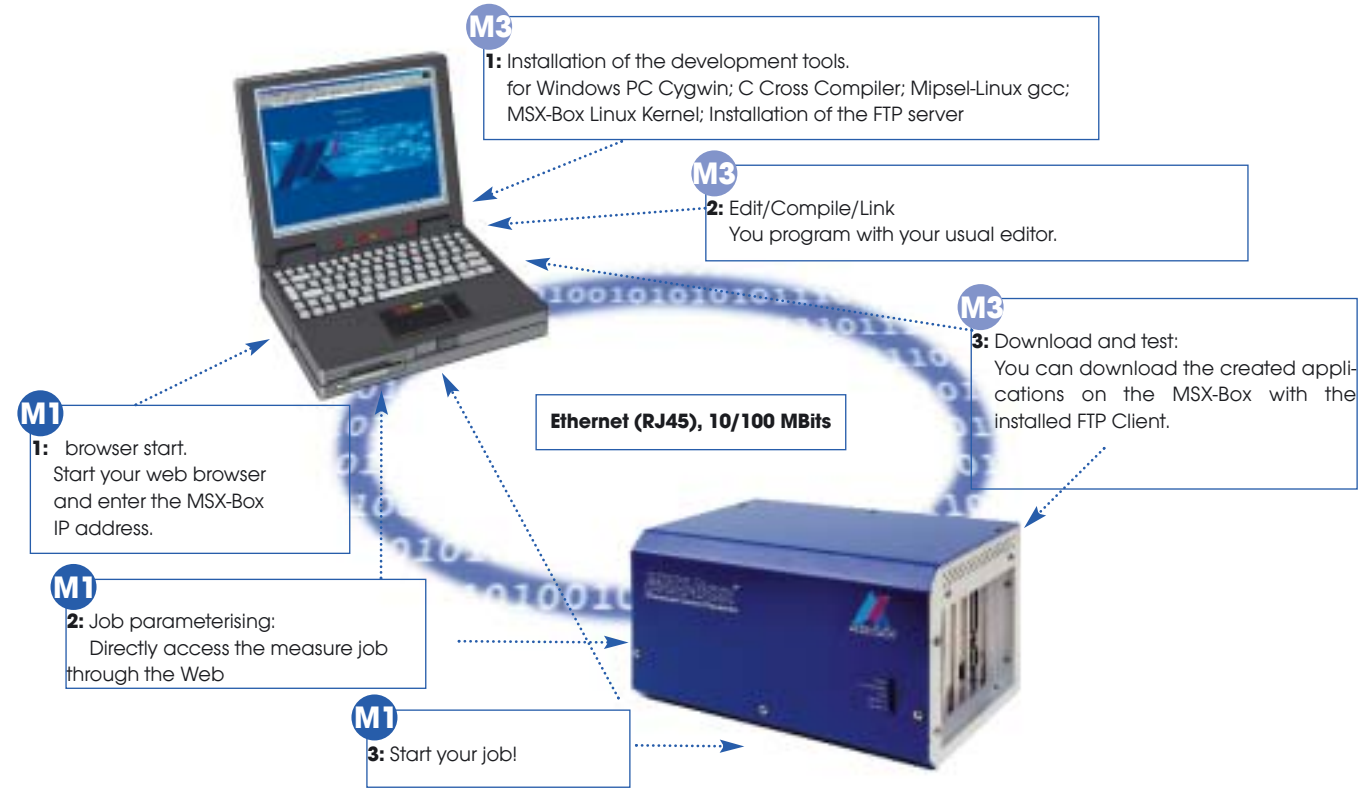
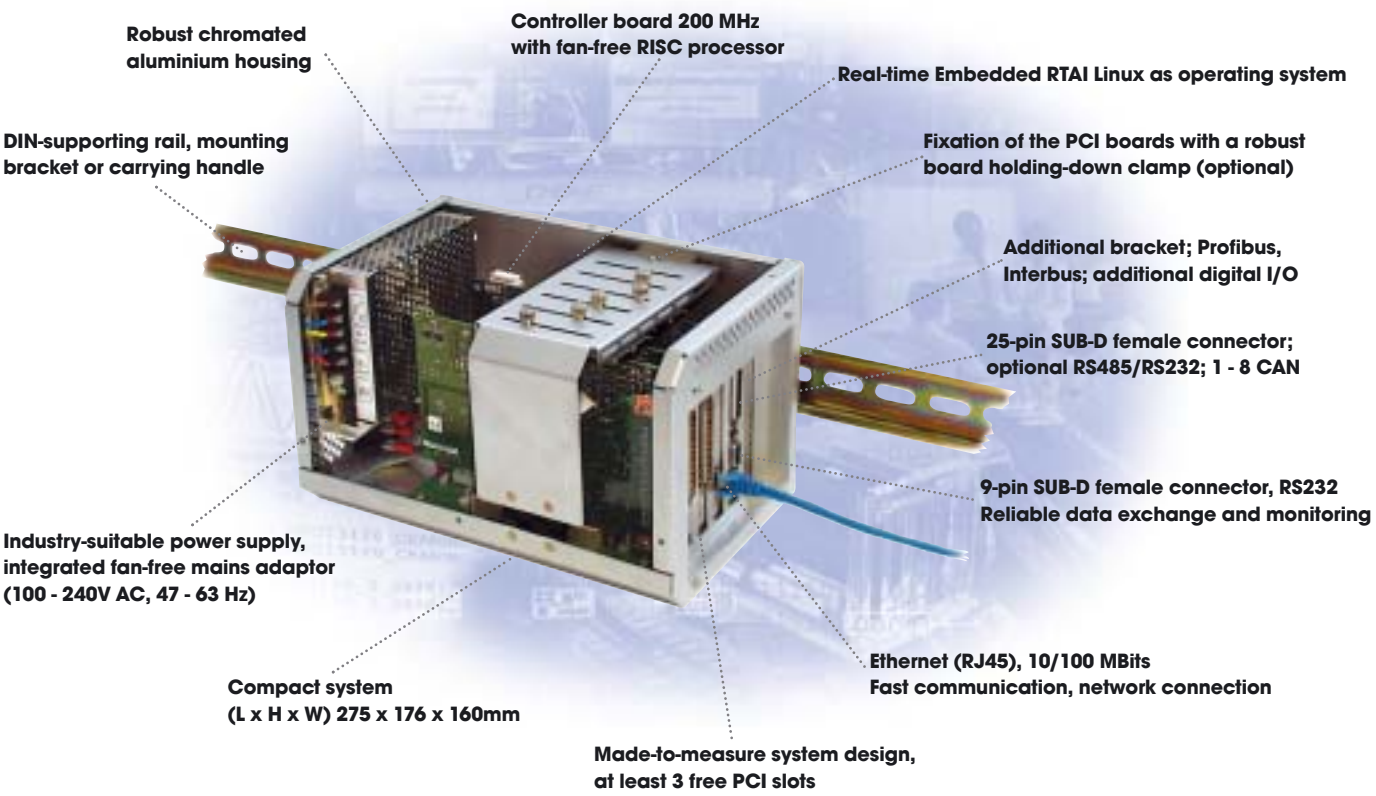
Complete PCI Embedded system
Software and hardware in detail

Using and programming the MSX-Box: 2 configuration examples:

M1 Model 1 (M1) – Standardised measurement and control solution

M3 Model 3 (M3) – Tool-Chain development solution





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Specifications

PCI controller board		
RISC processor:	64-Bit MIPs, fan-free	
Clock:	200 MHz	
Memory:	16 MB Flash 128 MB SDRAM, optional 256 MB	
Temperature monitoring:	configured delivery settings: 5° C to 45° C lower and higher values programmable; Interrupt can be generated when the value is exceeded Resolution: 0.5° C	
Installed OS:	Real-time Embedded RTAI Linux	
Standard interfaces:	SUB-D 9-pin:	1 x RS232
	SUB-D 25-pin:	reset input, 24 V; „High"- active 1 x relay output, free progr., closing contact
Logical input levels, reset input:		
U nominal:	6 mA at nominal voltage	
U_H max:	29 V	
U_H min.:	19 V .	
U_L max.:	13 V	
U_L min.:	0 V	
Optional:	SUB-D 25-pin:	1-8 CAN, master/slave, isolated 1 x RS232/RS485, isolated
	additional bracket:	1 x Profibus/slave, isolated 1 - 2 x Interbus/master, isolated 4 x dig. input, 24 V/ 10 mA, isolated 3 x dig. output, 24 V/200 mA, isolated
Dimensions:	PCI half-size board	

Extensive software support
Development tools for free (GNU compiler)

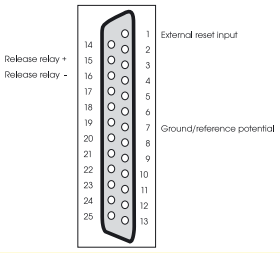
Ethernet PCI board (RJ45)	
Data transfer rate:	10/100 Mbits

Mains adaptor		
Input voltage:	100 V - 240 V, AC, 47-63 Hz (Other voltage on request)	
Input current:	1.2 A/ 115 V, 0,6/230 V	
Output voltage:	5 VDC	
Protection against:	short circuit; overload and overvoltage	
Connection:	power cable, 2m (depends on the country specifications)	

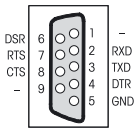
PCI passive backplane		
PCI slots:	Version MSX-Box 500 in total: 5	
	reserved:	1 x PCI controller board 1 x PCI Ethernet board
	free:	for 3 additional PCI half-size boards, 5 V
Compliant to:	PCI specification PICMG rev. 2.1.	

Compact housing	
Dimensions:	(B x H x W) 275 x 176 x 160mm
Weight:	ca. 2 kg. (Standard MSX-Box system)
Housing material:	chromated aluminium
Heat dissipation:	through convection
Temperature range:	0 - 40°C
Slot openings:	for 5 PC boards and 1 bracket
Status indicators:	5 LEDs, 2 of which are freely programmable

Accessories, optional	
Board fixation:	board holding-down clamp
Mounting possibilities:	• DIN rail • removable mounting bracket • carrying handle
Color (housing):	other housing color (according to RAL scale) and labelling on request



Pin assignment:
25-pin SUB-D connector X2



Pin assignment:
9-pin SUB-D connector X1 RS232 (Monitoring)

ORDERING INFORMATION

MSX-Box

MSX-Box-500: PCI Embedded system for made-to-measure and network solutions in the industrial measurement and automation.

Delivery contents:
- PCI controller board, fan-free 64-Bit MIPs processor, 200 MHz, 16 MB Flash, 128 MB SDRAM, 1 x RS232
- Ethernet PCI board (RJ45)
- Mains adaptor: 100 V - 240 V, AC, 47-63 Hz
- including 2 m power cable
- PCI passive backplane: 5 PCI slots (2 slots reserved for controller board and Ethernet board; 3 free PCI slots for half-size boards)
- Compact housing: chromated aluminium housing, incl. LED status indicator
- Software support: development tools (GNU compiler)
- Technical documentation

MSX-Box-800: PCI Embedded system for made to measure and network solutions in the industrial measurement and automation.
NEW! Delivery contents: 8 PCI slots, backplane, 3 free brackets
(2 slots reserved for controller board and Ethernet board; 6 free PCI slots for half-size boards)

Options:

MSX-256MB: Memory extension: optional up to 256 MB
MSX-485-232: 1-port serial interface RS485 or RS232 with optical isolation

MSX-Basis: Basic equipment for options MSX-CAN, MSX-Profibus, MSX-IBS and MSX-DIO-IO
MSX-CAN-X: 1-8 x CAN bus, master/slave, with optical isolation
MSX-Profibus: 1 x Profibus, slave
MSX-IBS-1/-2: 1 /- 2 x Interbus-S, master
MSX-DIG-IO: 4 digital inputs and 3 digital outputs, 24 V.
All basic extensions are optically isolated and incl. ribbon cable 9-pin SUB-D male connector on separate bracket

Accessories:

MSX-CLAMP: Board holding-down clamp for fixing the boards
MSX-SCREW: Mounting bracket
MSX-RAILDIN: DIN rail mounting
MSX-GRIP: Carrying handle

Optional:

- Ethernet patch cable 2 m, shielded, RJ45 (PC <-> MSX-Box)
- RS232 cable 1.5 m – 9-pin
- Personification of the housing color as well as front labelling
- Mains adaptor with other technical specifications

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