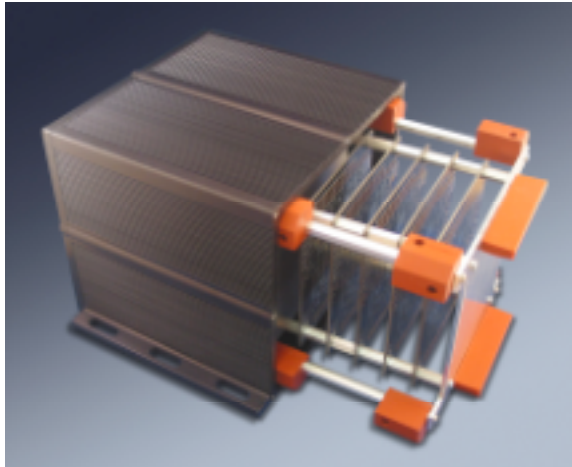


# **DYNAMIC ENGINEERING**

150 DuBois St Suite 3, Santa Cruz Ca 95060  
831-457-8891 Fax 831-457-4793  
<http://www.dyneng.com>  
sales@dyneng.com  
Est. 1988

## **User Manual**



### **Configurable Length PC104 Module Chassis**

# **PC104p-Chassis**

**Customized Chassis for:  
PC104p, PCI-104 and PC/104 Modules**

Revision A

**PC104p-Chassis**  
PC104p, PCI-104, PC/104 Chassis

Dynamic Engineering  
150 DuBois St. Suite 3  
Santa Cruz, CA 95060  
831-457-8891  
831-457-4793 FAX

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The electronic equipment described herein generates, uses, and can radiate radio frequency energy. Operation of this equipment in a residential area is likely to cause radio interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Dynamic Engineering's products are not authorized for use as critical components in life support devices or systems without the express written approval of the president of Dynamic Engineering.

Connection of incompatible hardware is likely to cause serious damage.



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# Table of Contents

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PRODUCT DESCRIPTION AND USAGE	5
<b>Materials:</b>	7
<b>Sizes:</b>	8
<b>Mounting:</b>	9
APPLICATIONS GUIDE	10
Interfacing	10
Construction and Reliability	10
Thermal Considerations	10
WARRANTY AND REPAIR	11
Service Policy	11
Out of Warranty Repairs	11
For Service Contact:	11
ORDER INFORMATION	12



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# List of Figures

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FIGURE 1 EXTERNAL HOUSING	5
FIGURE 2 INTERNAL CARD CAGE	6
FIGURE 3 END VIEW DIMENSIONS	9

## Product Description and Usage

The PC104p-Chassis is a high quality enclosure designed for rugged environments. The chassis design consists of an outer housing, and an internal card cage. The inner card cage is isolated from the outer housing with shock and vibration absorbent material.

The chassis is extruded as a single tube. The extrusion is cut and then machined to match the end plates. The end plates are .219 THK to allow for the gasket to seal and plenty of strength to prevent warping under stress.

The bottom plate is approximately .250 thick and acts as a mounting flange. The bottom extends beyond the width of the basic chassis to provide mounting points. The mounting points are slots to allow for adjustment, and to accommodate preexisting mounting situations. The PC104p Chassis can be mounted in any orientation.

The outer housing has three main components: the extruded body of the chassis and the two end plates. The end plates are secured with screws and sealed with a built in gasket. The extruded housing and end-caps provide a penetration free enclosure.

The PC104p Chassis has not been pressure tested yet. The Chassis has passed a submersion test in a few feet of water with no leakage.



FIGURE 1 EXTERNAL HOUSING

The built-in heat-sink is on the sidewalls and top, both inner and outer surfaces. A larger view is available on the webpage. [http://www.dyneng.com/pc104p\\_chassis.html](http://www.dyneng.com/pc104p_chassis.html)

The internal card cage has two end plates supported with 4 rods. The rods are cut to fit the chassis max module count. The rods provide rigidity to the card cage and support the vibration damping elements “bumper pads”.

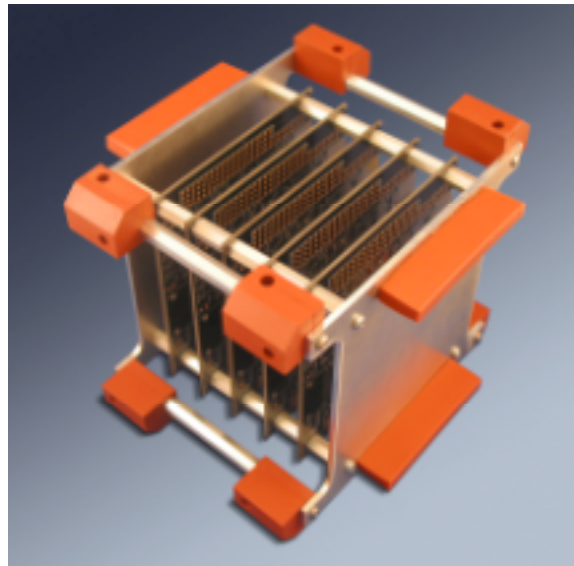


FIGURE 2 INTERNAL CARD CAGE

The modules are mounted to the end plates using standard PC104 .6” tall stand-off’s. In the case where there are fewer modules than the chassis will accommodate, the stand-off’s will take up the space. The stand-off’s are secured at both ends of the card cage to the end plates.

PC104 cards include CPU’s and other “high power” consumption card types. The PC104p-Chassis is designed to make use of the PC104p spacers to route heat from the modules to the end plates, and to the external chassis. The internal card cage is suspended on the sides with the Bumper Pads, and on the ends with stainless steel springs [not shown]. The springs provide shock absorption, and thermal conductance. The external housing has mass and surface area. In many cases the external housing’s built in heat sink is enough to keep the internal electronics within their operating parameters.

The external housing has a built in mounting flange. If the chassis is mounted to a “cold plate” the internal electronics can be cooled with conduction. For example if the chassis is mounted within a Buoy the ocean will provide an “infinite” ability to absorb heat from the chassis. The electronics can be kept at a constant temperature.

The external housing has a heat sink built into the inside as well as the outside. An alternate method of cooling is to use a “Fan Board” to circulate air within the chassis, using the heat exchanger, to cool to the outside.

The PC104 stack will require power to operate. Any PC104 stack power module can be used within the PC104p-Chassis. Dynamic Engineering currently offers two models. The PC104pPWR12 and PC104pPWR28 utilize either 12 or “28” V power to generate the stack voltages of  $\pm 12$ , 5, 3.3, and  $-5$ . The PC104pPWR12 and PC104pPWR28 tie the ground planes to the stack mounting holes to make use of the chassis cooling mechanism.

The PC104p Chassis comes complete – The Bumper Pads, internal chassis, and mounting hardware are supplied. The 6 slot and smaller chassis use the corner arrangement for the bumper pads. The 7 slot and larger chassis have an added central set of bumper pads to provide proper support with the longer chassis.

The external housing is extruded allowing any number of slots to be supported. If you require a “custom” model please ask.

Dynamic Engineering has developed a relationship with a machining company. We can adapt the internal and external end plates to your specifications. Dynamic Engineering can help with your requirements if your company does not have a machining capability of your own. Dynamic Engineering can do the design work or work from a PDF that you provide. We will assign a part number for each configuration to allow process control and the ability to re-order without starting over.

The chassis design allows for plenty of room in the “connector area” of the PC104 module. As seen in figure 2, the end plates are designed with relief in the channel where the cables will go. The channel plus the distance to the external housing provides approximately .92” x 3.445” on each side of the stack for cable routing.

## **Materials:**

PC104p Chassis is made of high quality materials:

Outer chassis extrusion: Aluminum 6061

Outer chassis plates: Aluminum 6061

Hardware: Stainless

Inner chassis supports: Aluminum 6061 1/4 hex

inner chassis end plates: Aluminum 6061

Bumper pads: 60 Durometer Red Silicone Rubber



## Sizes:

Slots	Internal End Plate	External End Plate
2	2.134	3.792
3	2.802	4.460
4	3.47	5.128
5	4.138	5.796
6	4.806	6.464
7	5.474	7.132
8	6.142	7.800
9	6.81	8.468
10	7.478	9.136
11	8.146	9.804

The sizes shown are in inches and refer to the distance to the outside edges of the internal and external end plates. The external end plate is .219" overall and .062" less in the center area where the end plate is recessed.

The distance shown for the internal end plate is predicated on a uniform .062" board. The internal end cap distance may be slightly different depending on the "real" board thickness. There is enough compression in the bumpers and flexibility in the Internal End Plates to accommodate the fluctuations in board thickness.

If you are using non-standard board [thickness wise] please contact Dynamic Engineering to make custom length internal or external chassis components.



## Mounting:

The mounting flange has slots to provide the user with mounting options. The slots are set to be 1/4" from the ends plus one at the center for the 3-8 module sizes. Starting with the 9 module chassis there are 5 equally spaced slots.

The slots are approximately 1.25" x .280". Please contact us if you need a specific hole pattern on the mounting flange. The slots are approximately .280" wide.

The hole centers are 6.55" apart when measured across the chassis. The mounting tabs are .5" wide on each side. The outer dimension at the tab is 7.050".

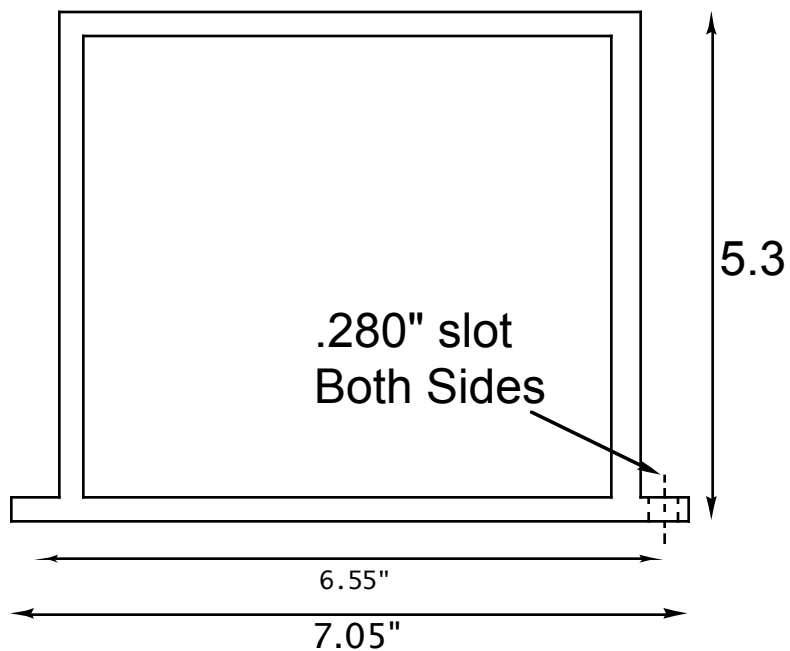


FIGURE 3 END VIEW DIMENSIONS

# Applications Guide

## Interfacing

Some general interfacing guidelines are presented below. Do not hesitate to contact the factory if you need more assistance.

### ESD

Proper ESD handling procedures must be followed when handling the modules to be used within the PC104p Chassis. The Chassis is metal and “does not care” about ESD etc. When installing the cards the installer must be properly grounded and the hardware should be on an anti-static work-station.

**Watch the system grounds.** All electrically connected equipment should have a fail-safe common ground that is large enough to handle all current loads without affecting noise immunity. Power supplies and power consuming loads should all have their own ground wires back to a common point.

### Construction and Reliability

The PC104p-Chassis is made of Black Anodized Aluminum, with stainless steel hardware. The chassis is designed to be rugged and priced to be lab friendly.

### Thermal Considerations

Suitable for conduction and convection cooled environments. Please consider a Fan board for high dissipation situations. The chassis end plates can be slotted or fit with a Fan and EMI filter to allow direct convection cooling – the chassis will not be sealed in this configuration. The heat-sink can be utilized to be a heat exchanger from the sealed internal volume to the external environment. The mounting plate can be used for conduction cooling if that is available.



## Warranty and Repair

Please refer to the warranty page on our website for the current warranty offered and options.

<http://www.dyneng.com/warranty.html>

## Service Policy

Before returning a product for repair, verify as well as possible that the suspected unit is at fault. Then call the Customer Service Department for a RETURN MATERIAL AUTHORIZATION (RMA) number. Carefully package the unit, in the original shipping carton if this is available, and ship prepaid and insured with the RMA number clearly written on the outside of the package. Include a return address and the telephone number of a technical contact. For out-of-warranty repairs, a purchase order for repair charges must accompany the return. Dynamic Engineering will not be responsible for damages due to improper packaging of returned items. For service on Dynamic Engineering Products not purchased directly from Dynamic Engineering contact your reseller. Products returned to Dynamic Engineering for repair by other than the original customer will be treated as out-of-warranty.

## Out of Warranty Repairs

Out of warranty repairs will be billed on a material and labor basis. The current minimum repair charge is \$100. Customer approval will be obtained before repairing any item if the repair charges will exceed one half of the quantity one list price for that unit. Return transportation and insurance will be billed as part of the repair and is in addition to the minimum charge.

## For Service Contact:

Customer Service Department  
Dynamic Engineering  
150 DuBois St. Suite 3  
Santa Cruz, CA 95060  
831-457-8891  
831-457-4793 fax  
support@dyneng.com



## Order Information

PC104p-Chassis

[http://www.dyneng.com/pc104p\\_chassis.html](http://www.dyneng.com/pc104p_chassis.html)

1-11 slots rugged sealed chassis for PC104, PC104p, PCI-104 applications with conduction and convection cooling design features.

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