

## DVP-Digital Velocity & Pressure Control Card Model : J124-032



# Overview

The MOOG DVP controls Velocity and Pressure(V/P) by closed loop and improves the injection molding process with MOOG high performance servovalve.

It is a Digital Signal Processor (DSP) board, which has the analog interface and the control software for injection cylinder in each process.

The parameters (gain etc.) of closed loop can be

- adjusted by serial communication from a PC
- stored in the flash memory on the DVP.

Once parameters are set and stored, the DVP works as a standalone controller.

The card size is conformed to standard EURO board format - 3U (100 x 160 mm).

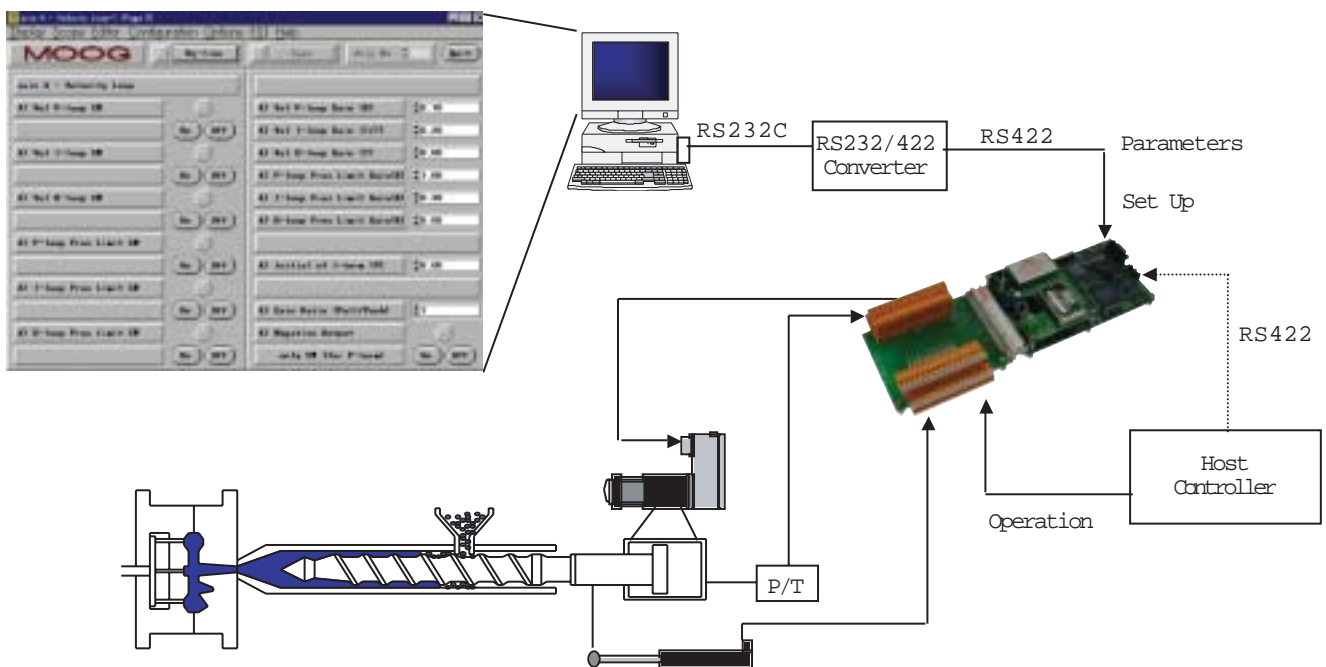
# Function

The precise and repeatable injection process control can be achieved by DVP with MOOG servovalve.

The card has the following functions:

- Closed loop injection velocity control with pressure limit for mold protection
- Switchover of control mode from velocity to pressure
- Closed loop packing and holding pressure control
- Closed loop back-pressure during plasticizing
- Decompression control
- Position control by using 4way servovalve

Each card has 2 axis control (limited in the number of AI).



# Features & Benefits

DSP's high speed processing enables high servo cycle (0.33 ms)

Control algorithm fit to injection molding machine is pre-installed.

- Pressure limit circuit

The injection pressure limitation is activated, when the actual pressure has been reached the setpoint pressure, thereby reducing the injection speed.

This function can be utilized to obtain the smooth switchover from velocity to pressure mode.

Besides, the mold can be protected under an unusual machine condition.

- Load compensation circuit

Decline of velocity is compensated when injection pressure becomes high

- Ramp Control

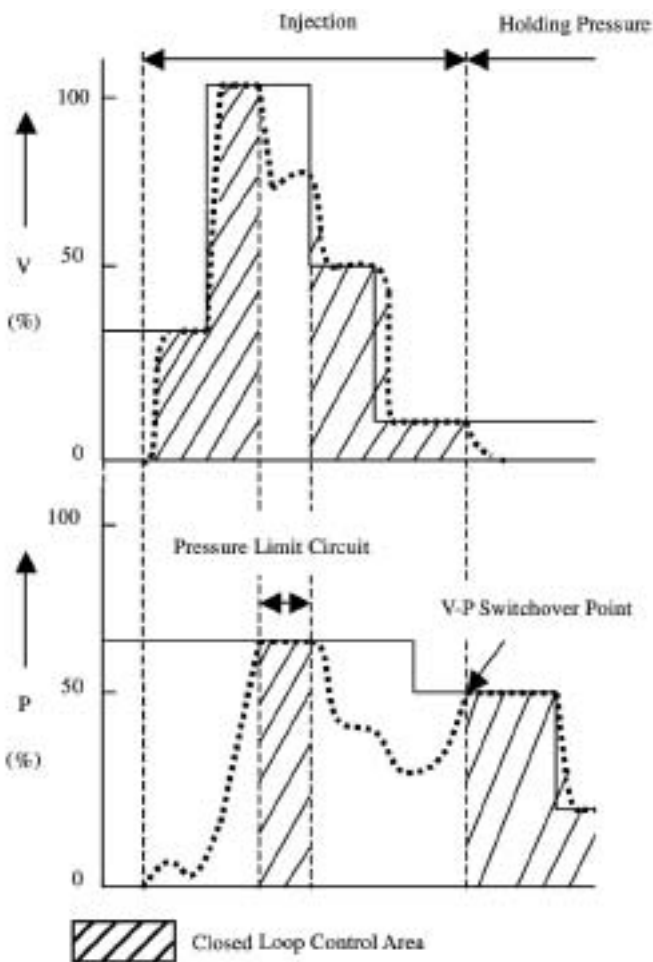
Ramp rate of velocity command input signal can be changed depending on the characteristics of injection molding machines.

Entering the digital number for tuning parameters enables the precise and repeatable adjustments.

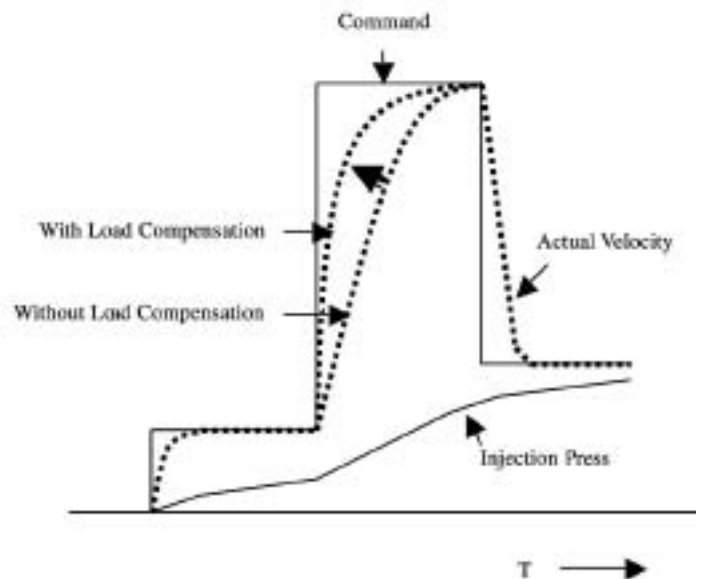
This function shortens set up time comparing with a conventional V/P card with analog circuit.

Test points installed in the software control circuit enables signal monitoring from analog output.

Control algorithm specialized in your injection molding machine is available as a special order.



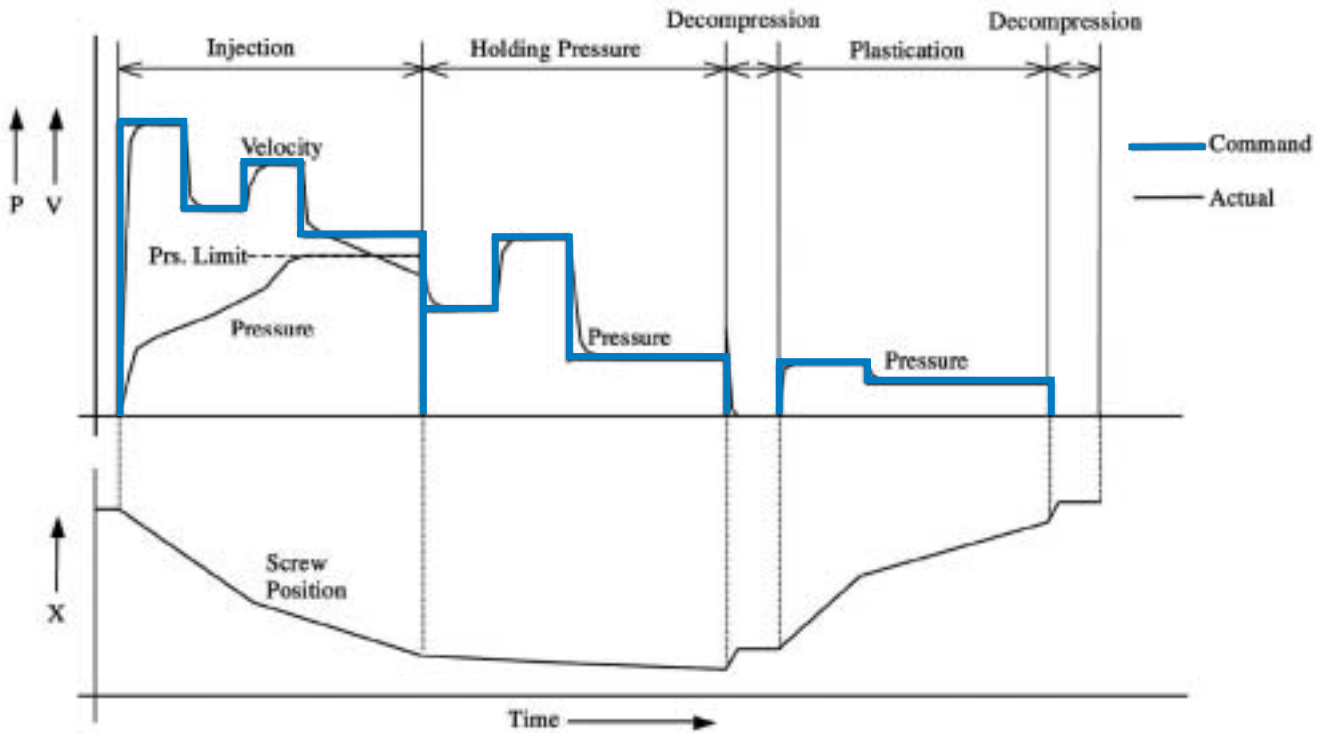
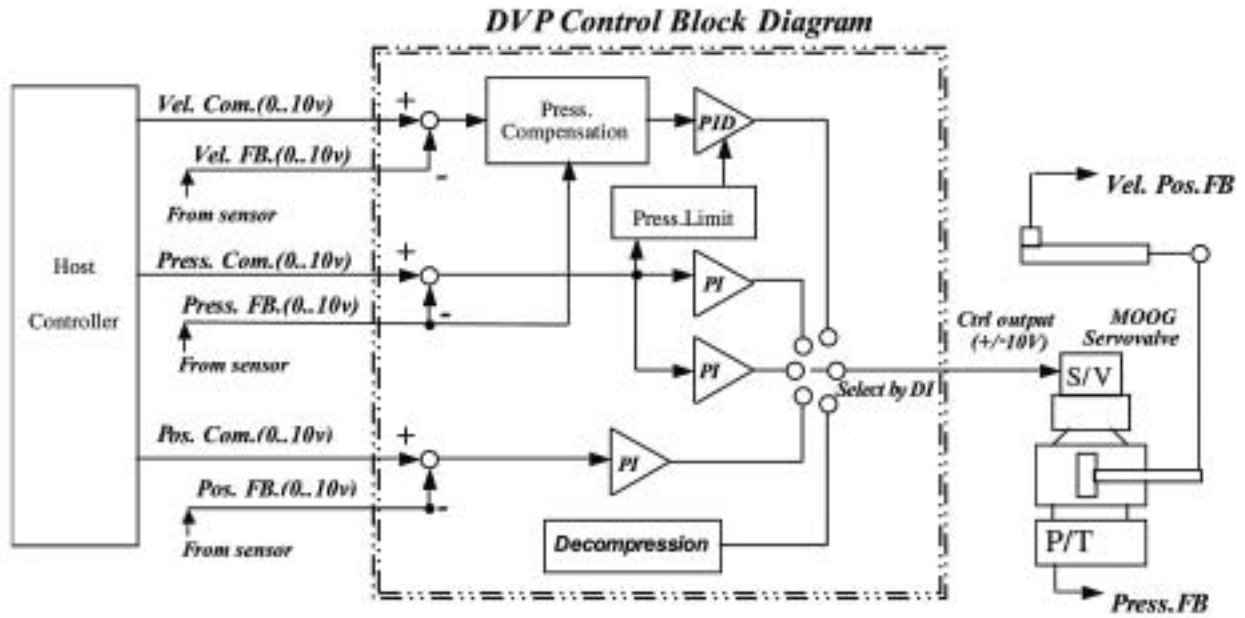
<Pressure Limit Circuit>



<Load Compensation Circuit>

# Description

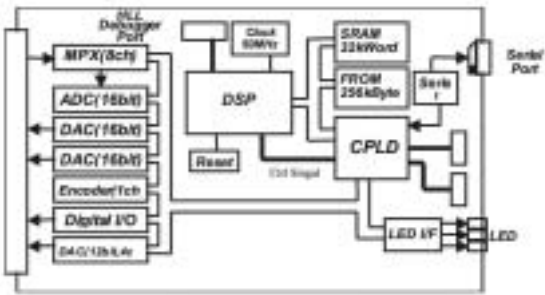
The following diagram shows the simplified injection control block. The interface of the control block is analog voltage. The DVP receives command from host controller and feedback from sensor, then give the control output to servovalve. The control modes are switched by digital inputs from host controller.



<Typical control data in injection process controls>

# Interface

## Block Diagram



## Front Panel

D-type 9 pin connector (RS422 for parameter set-up)  
3 LEDs (status of the DVP)

## I/O Interface Connector

DIN41612 96pin (b and c are used, a is NC)

## Power supply

24VDC/500mA, Or +/-15VDC/25mA & 5VDC/1.5A

## Analog Input (AI)

No. of channels : 8  
Resolution : 16 bit  
Input type, range : differential input, +/-10V  
(Common mode : max30V)  
Filtration : 100kHz  
Input impedance : 100k ohm

## AI Channel 0 (AI\_0)

The analog differentiator can be inserted to the AI\_0.

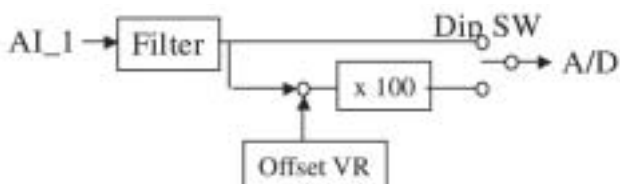


AI_0 Input Signal	Differentiator Output voltage
+/- 5V/sec	+/- 10V
+/- 10V/sec	
+/- 25V/sec	
+/- 50V/sec	

The range of differentiator is selectable by dip switches.

## AI Channel 1 (AI\_1)

The analog amplifier (x100) can be inserted by Dip SW.  
This function is for a pressure transducer which has small voltage output (+/-100mV)



The rate of amplification is high (100 times), then a variable resistor (VR) is prepared on the board to adjust offset.

## Analog Output (AO) for Control

No. of channels : 2  
Resolution : 16 bit  
Output range : Ch 0 +/- 10V, 7.5/20/50/100mA  
Selected by dip switch and jumper  
: Ch 1 +/- 10V  
Filtration : None  
Output capacity : 1mA for voltage output (+/-10V)

## Analog Output (AO) for Monitor

No. of channels : 4  
Resolution : 12 bit  
Output range : +/- 10V  
Filtration : None  
Output capacity : 1mA (load should be 10k ohm min.)

## Digital Input

No. of channels : 10  
Type : Sink / Source  
Isolation : Optical isolation  
Input Voltage : 15 .. 24VDC (High level)  
Input Current : 2mA min. / ch

## Digital Output

No. of channels : 8  
Type : Sink (NPN) / Source (PNP)  
(The type is decided by the model number)  
Isolation : Optical isolation  
External Power : 15 .. 24V  
Output Current : 100mA max.  
Protection : Over load protection

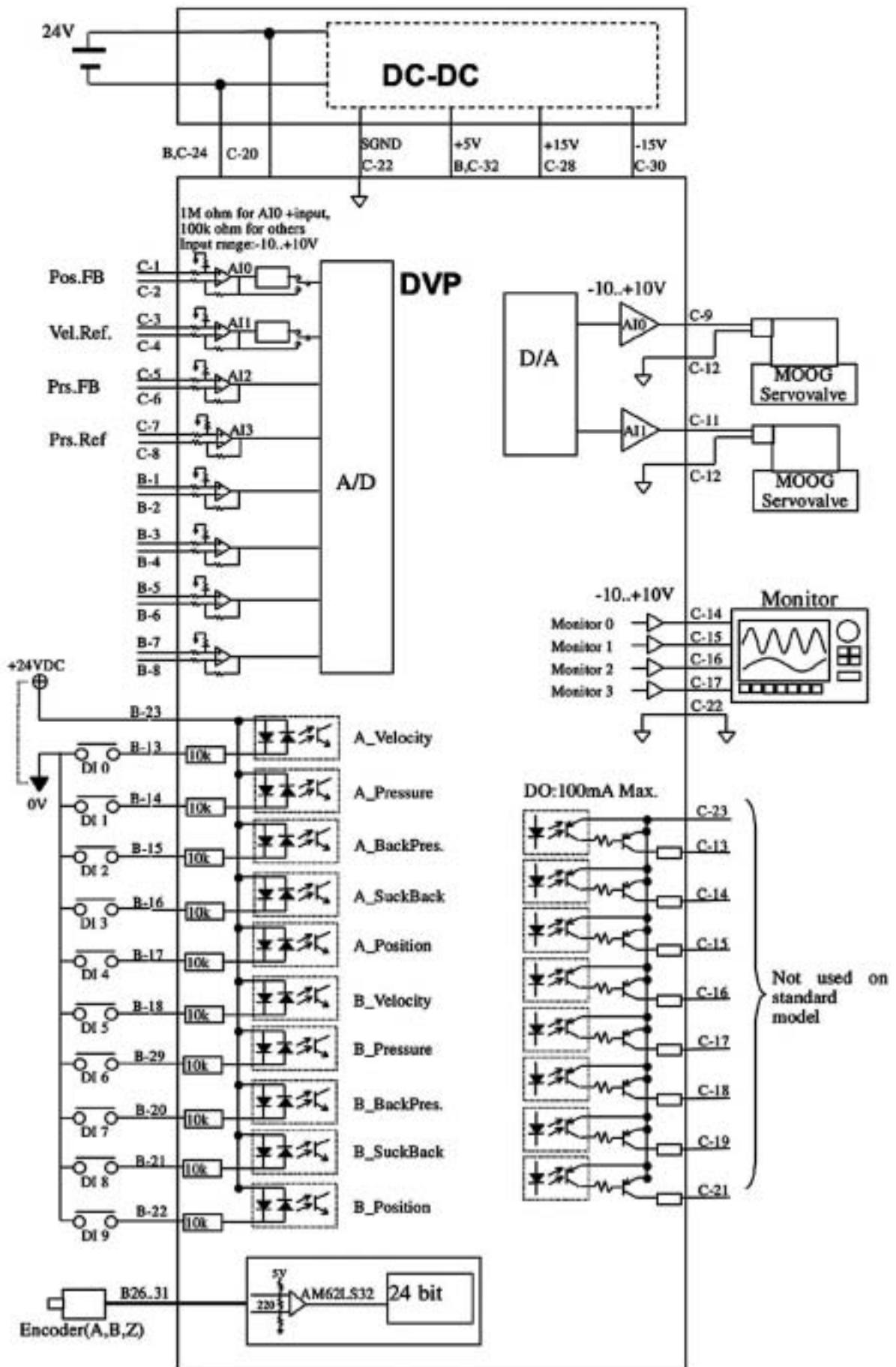
## Encoder Input

No. of channels : 1  
Encoder type : Incremental (A,B,Z), Linear  
Counter range : 24 bit  
Max. pulse rate.: 1.25MHz for each phase A / B.

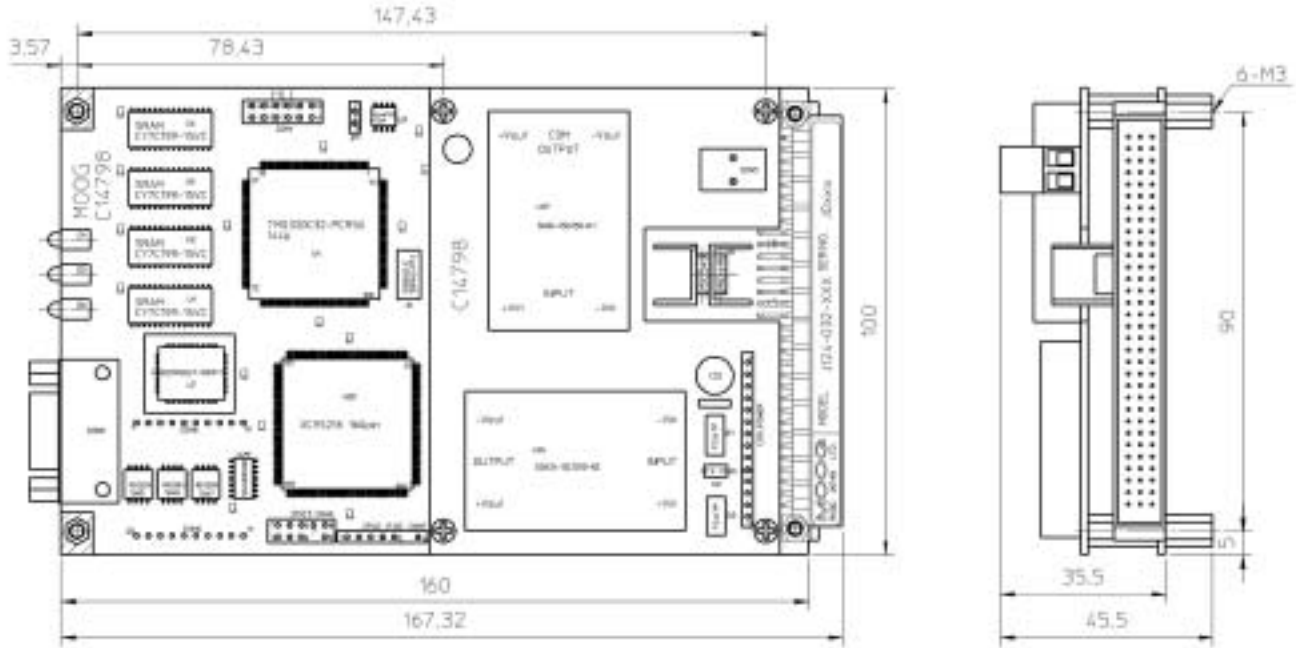
## MPU & Memory

MPU : DSP, TMS320C32 (TI)  
Clock : 50MHz  
RAM : 32kWord (1Word=32bit)  
Flash Memory : 256kByte

# Connection Example



# Installation



- Power : 24VDC
- Connector : DIN41612 96-pin
- Weight : 0.26kg(140 without DC-DC board)

# Accessory

## Connector Board (C34842-001)

The Connector Board is prepared for easy wiring. It has removable screw type connectors and LED to show the status of the digital inputs.

## Mount Board (C49902-001)

## GOUI DVP Package (C34786-003)

Windows based HMI to adjust gain parameters by PC

## RS232/422 Converter (A47733-026)

## AC adapter for RS232/422 Converter (A47733-027)

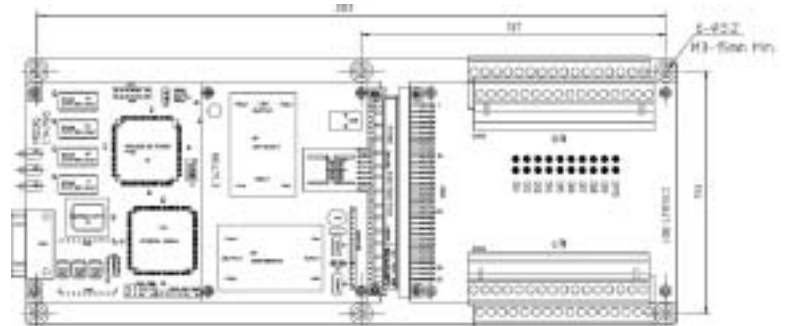
## Cable Assembly for RS232 serial communication (C14952-00X)

This cable is used between PC(RS232 port) and RS232/RS422 converter

## Cable Assembly for RS422 serial communication (C14953-00X)

This cable is used between RS232/RS422 converter and DVP Card Holder

## C49902-001



# Ordering Information

Model Number	DO type	DC/DC converter	Power Supply
J124-032-001	Sink	with	24VDC
J124-032-002	Sink	No	5VDC,+/-15VDC
J124-032-003	Source	with	24VDC
J124-032-004	Source	No	5VDC,+/-15VDC

DC/DC Converter makes +/-15V DC and 5VDC from 24VDC.

The standard control software is included in the flash memory on the card

One floppy disk for the parameter set up screen files for GOUI comes with DVP

# MOOG



Australia	Melbourne
Austria	Vienna
Brazil	Sao Paulo
China	Shanghai
Denmark	Birkerod
England	Tewkesbury
Finland	Espoo
France	Rungis
Germany	Böblingen



Hong Kong	Kwai Chung
India	Bangalore
Ireland	Ringaskiddy
Italy	Malnate(VA)
Japan	Hiratsuka
Korea	Kwangju
Philippines	Baguio
Russia	Nizhegorodskaya
Singapore	Singapore
Spain	Orio
Sweden	Gothenburg
U.S.A	East Aurora(NY)
	Torrance(CA)
	Salt Lake(UT)
	Chatsworth(CA)