



## PCU-100

### PROGRAMMABLE VIBRATION MONITORING/PROTECTION UNIT

#### DESCRIPTION

The PCU-100 is a multi-channel, digital processing unit. Its on-line programmability provides maximum flexibility for on-site custom system configuration.

The innovative modular design allows various mix and match possibilities of input, output and relay modules for up to 8 inputs. It readily accepts PCS-100 series proximity probes, as well as proximity probes, accelerometers and velocimeters from most manufacturers.

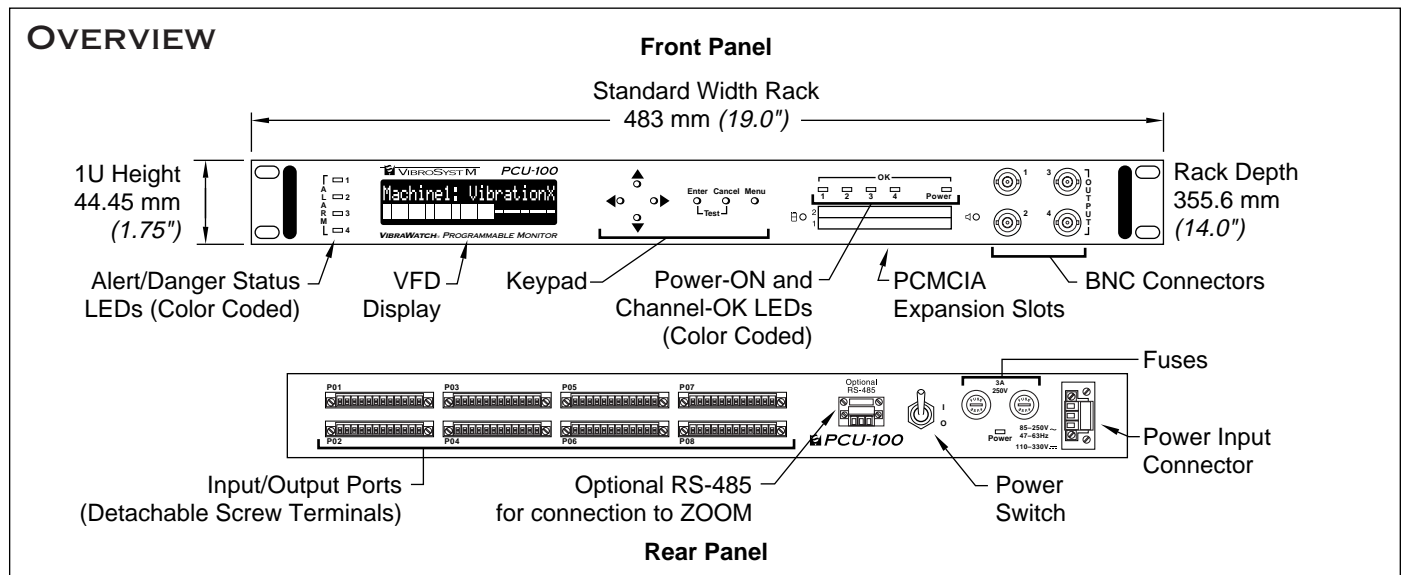
The front-panel keypad and high visibility vacuum fluorescent display (VFD) permit the modification of all settings in minutes without disrupting on-line monitoring. Four BNC connectors and two PCMCIA expansion slots are accessible from the front panel.

#### APPLICATIONS

- On-line vibration monitoring and protection of critical rotating machinery
- Collect data for trend analysis of vibration levels and condition-based (predictive) maintenance

#### MAIN FEATURES

- Multi-tasking, multi-channel, modular design, digital processing instrumentation
- Fully on-line configurable
- Up to 8 inputs supported
- Readily accepts PCS Series proximity probes, plus proximity probes, accelerometers and velocimeters from most manufacturers
- Alarm monitoring on resultant vector ( $S_{MAX}$ ), single-channel or dual-channel input (voting logic)
- Two sets of selectable Alert & Danger alarm thresholds for specific transitory operating conditions
- Choice of on-site selectable outputs: raw, processed, relays
- Bar graph displays for visual vibration interpretation
- Digital inputs and outputs for remote control
- Rear-panel I/O ports with detachable screw terminals





## DESIGN

The PCU-100 is built with a space saving design. The front-panel hosts a vacuum fluorescent display (VFD), a keypad, status LEDs, BNC connectors and PCMCIA expansion slots. The back-panel features I/O ports with detachable screw terminals, fuseholders, power input connector and switch.

Inside, the unit features a universal power supply and internal expansion slots for 8 task modules. This provides configuration flexibility whether the PCU-100 is used for protection, for on-line monitoring, or for both, and makes the PCU-100 readily compatible with virtually all AC and DC power inputs world-wide. Each PCU-100 can support a maximum of 8 vibration input channels.

## PROGRAMMING

The PCU-100 is fully on-line configurable using the front-panel keypad and display to change any setting in minutes without disrupting the monitoring operation. Settings can be backed-up on a PCMCIA flash memory card. The setting menus are password protected to prevent unauthorized access.

Menus are used to enter information, select among preset features, and enable/disable various parameters.

The user can choose to enable or disable modules, channels, inputs, outputs, or relays, and to enter different values such as low and high limits, hysteresis, filters, time constants and delays. He can also select amongst types of signal processing (rms, peak, average, AC, DC, AC+DC, maximum value) and signal combination (resultant vector, absolute vibration), active relay level (energized/deenergized), channels to be displayed on bar graphs and system units.

Two sets of Alert and Danger thresholds are supported and can be switched remotely for alarm monitoring of specific transitory operating conditions.

## DISPLAY

The VFD screen is used for bar graph display and unit configuration. Up to 12 output channels (resultant vector, absolute vibration, or individual channel processing) can be displayed one at a time as bar graphs.

In monitoring mode, the screen displays the vibration of a selected channel. The lower line displays the vibration bar graph with indicators for peak, alert and danger levels. The upper line shows information such as machine or channel ID and status, numerical vibration value, percentage of full scale, Alert and Danger thresholds.

The Right and Left arrow buttons enable to select and change the channel to be displayed as a bar graph. The Up and Down arrow buttons are used to select the type of information to be showed on the upper line.

## TASK MODULES

The universal design of the **Vibration Input Module** readily accepts various types of probe inputs: capacitive proximity (PCS-100 series), eddy-current proximity, velocity, acceleration. It supports two probe input channels, provides channel-matching high-speed raw analog outputs (-20 to +10 V), and can supply two virtual inner channels. It locally processes the channels individually or combines them to calculate the resultant vector or absolute vibration.

The **Analog Output Module** supports up to four virtual inner channels and can directly provide as many processed outputs (4 to 20 mA and 0 to 10 V). It performs the signal processing for either direct output or virtual inner channel for alarm monitoring. Each module can process several signals: rms, peak, average, raw (with passband filtering), AC+DC, AC, DC, maximum value, or none.

Two types of protection relay modules are available:

- **Internal Relay Module** features three DPST relays used for Alert, Danger or System-OK outputs.
- **External 9-Relays & Driver Module** activates up to 9 DPDT relays mounted external to the PCU-100 unit. Each relay can be readily used for Alert, Danger or System-OK outputs.

The **Synchronization & Digital I/O Module** is used for phase reference input and output, as well as digital inputs and outputs. It readily accepts the synchronization signal from VibroSystM's synchronization probe, from another PCU-100 unit or from VibroSystM's AGMS or ZOOM systems. Digital inputs are used for remote switching controls such as Rack Inhibit, Alarm Reset, Danger Bypass, Power-up Inhibit, and Alarm Threshold select. Digital outputs are used to transmit unit status information such as Power-ON, Power Failure, and Rack Bypass while alarm is inhibited.



## TASK MODULES MAIN SPECIFICATIONS

### Vibration Input Module

- Input
  - Number (up to) 2-channel
  - Device PCS-series capacitive and eddy-current proximity probes, accelerometer, velocimeter, or transducer driver
  - Signals Digital RS-422-A for PCS Analog voltage or current for others ( $\pm 10$  V,  $\pm 20$  V, 4 to 20 mA, 0 to 20 mA)
- Signal Processing (DSP) Analog-to-Digital and Digital-to-Analog, linearization (PCS), resultant vector, absolute vibration
- Output (from DSP)
  - Number (up to) 2 internal channels (virtual), 2 external channels (signal)
  - Signals
    - Internal Digital
    - External Analog, high-speed raw, linearized (PCS), proximity probe -2 to -18 V, accelerometer  $\pm 10$  V, velocimeter  $\pm 10$  V
- Probe Supply
  - Voltage +12 VDC (PCS)  
-24 VDC (EC & velocimeter)  
+24 VDC (accelerometer)
  - Current Short-circuit protected,  
+30 mA (PCS)  
-15 mA (EC & velocimeter)  
+15 mA (accelerometer)

### Analog Output Module

- Signal Processing
  - Number (up to) 4-channel processing
  - Types Available rms, peak, average AC+DC, AC, DC, maximum value, raw (with passband filtering), none
- Output
  - Number (up to) 4 channels
  - Ranges 4 to 20 mA and 0 to 10 V

### Internal Relay Module

- Number of contacts 3 relays
- Type DPDT contacts
- UL/CSA Rating 0.6 A @ 110 VDC,  
0.6 A @ 125 VAC (50/60 Hz)

### External Relays & Driver Module

- Number 9 external relays and drivers
- Type To drive external DPDT contacts
- UL/CSA Rating 0.6 A @ 110 VDC,  
0.6 A @ 125 VAC (50/60 Hz)

### Synchronization & Digital I/O Module

- Synchronization
- Input Type Synchronization Probe or signal from other unit provided by normally opened NPN transistor
  - Output Type Normally opened NPN transistor with current absorption up to +25 V max.
  - Output Applied Voltage up to +25 V max.
  - Probe Supply
    - Voltage +5 VDC or +12 VDC,  $\pm 5$  %
    - Current +40 mA max., short-circuit protected
- Digital
- Input Number 4 channels  
Rack Inhibit, Alarm Reset, Danger Bypass, Power-Up Inhibit
  - Input Type TTL level detection
  - Output Number 3 channels  
Power-ON, Power-Low, Rack Bypass
  - Output Type Normally opened NPN transistors



## PCU-100 GENERAL SPECIFICATION

### Operating

- Probe Inputs PCS-series proximity probes  
Eddy-current probes  
Accelerometer transducers  
Velocity transducers
- Synchronization Synchronization probe or  
Input & Output signal from/to another rack
- Digital Inputs Rack Inhibit, Alarm Reset,  
Danger Bypass,  
Power-Up Inhibit,  
Alarm Threshold Select
- Analog Outputs High-speed raw (linearized),  
rms, peak, average AC+DC,  
AC value, DC value,  
maximum value, raw, none,  
resultant vector,  
absolute vibration,  
phase signal
- Digital Outputs Power-ON, Power-Low,  
 Rack Bypass
- Processing Rate 4065 samples/sec. per  
input channel
- Display 2x20 characters  
Vacuum Fluorescent Display

### Power Supply

- Voltage Input Universal,  
85 to 265 V<sub>AC</sub> (47 to 63 Hz)  
or 110 to 330 V<sub>DC</sub>
- Consumption 20 W max.
- Fuse Two 3AG  
(250V, 0.75A slow-blow)
- Connector 1 removable mini connector  
(screw terminal)

### Connection

- External I/O Ports on Rear-panel 8 removable mini connectors  
(screw terminals)  
1 removable mini connector  
(screw terminal) for  
optional RS-485 communi-  
cation with AGMS or  
ZOOM systems
- Auxiliary Outputs on Front-panel Four BNC type  
Two PCMCIA slots

### Environmental

- Temperature Drift ±500 ppm/°C
- Temperature Range
  - Operating 0° to 50°C (32° to 122°F)
  - Storage -40° to 80°C (-40° to 176°F)
- Humidity Up to 95%, noncondensing

### Physical Characteristics

- Casing Closed anodised aluminum  
shell with two handles
- Width 483 mm (19 in.)
- Height 1 U
- Depth 44.5 mm (1.75 in.)
- Weight 355.5 mm (14 in.)

VibroSystM reserves the right to change specifications to improve products without notification.  
† Patented measuring technology

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