

Overview: MPVS Duo Signal Outputs

The Miller MPVS Duo pressure–volume system produces analog outputs for key channels:

Pressure
Volume
Phase
Magnitude
Pressure #2

These analog signals are presented on BNC connectors, 0–4.095 V range, for easy connection to most DAQ systems.



Hardware Compatibility with iWorx Recorders

1. iWorx IX-404 (4 BNC analog inputs)

Description: Four analog input channels, USB interface, ± 10 V range, 16-bit resolution (≈ 10 kHz).

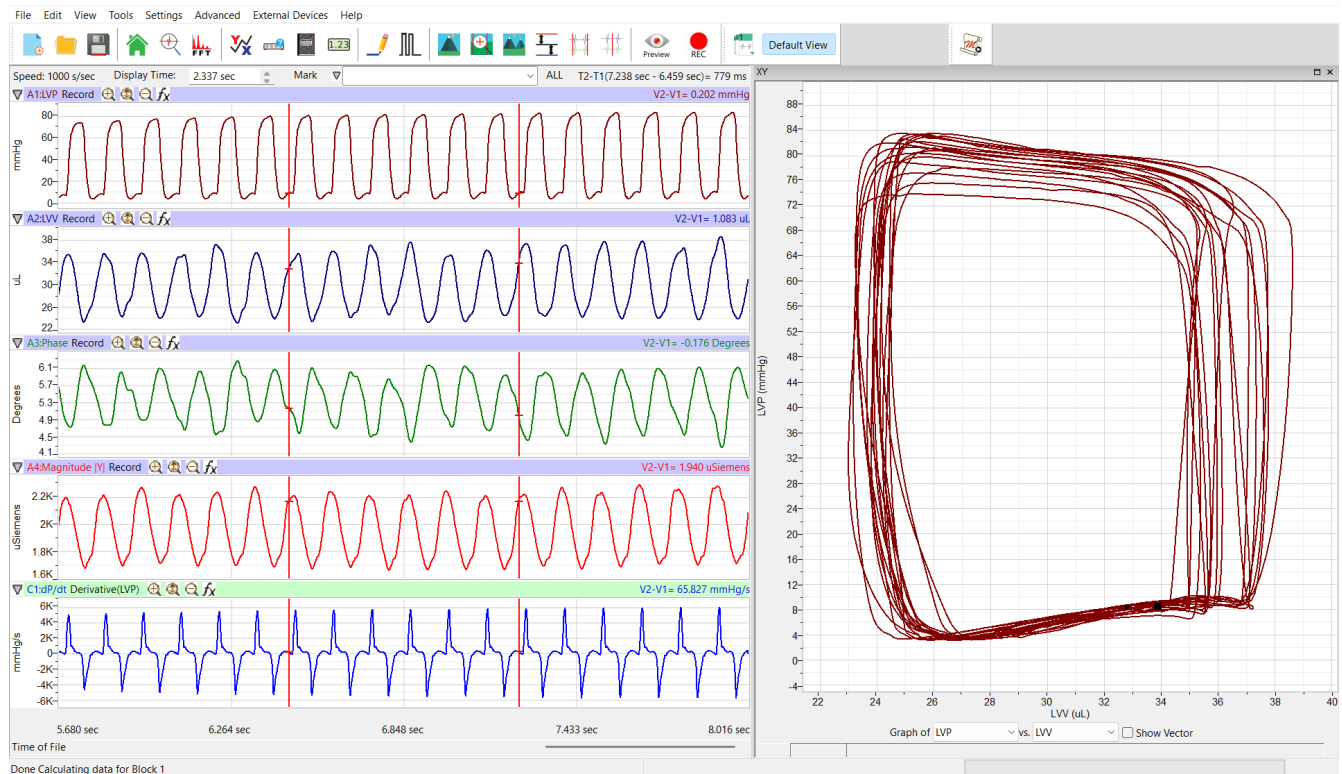
Use case: Ideal low-channel count acquisition; good for direct recording of the four main PV outputs.

Connection: Connect each MPVS Duo BNC output directly to an IX-404 BNC input.



<u>MPVS Duo Output</u>	<u>IX-404 Input</u>
Pressure → Ch1	BNC analog in 1
Volume → Ch2	BNC analog in 2
Phase → Ch3	BNC analog in 3
Magnitude → Ch4	BNC analog in 4

LabScribe will record each input as a separate channel.



2. iWorx RA-834 (10+ Channel Recorder including 4 BNC & 4 DIN8 inputs)

Description: Multi-channel data recorder with 4 BNC inputs, 4 Transducer inputs, 2 Event Marker inputs, 8 digital inputs, a low voltage and high voltage stimulator, 8 digital outputs and 4 iWire inputs.

Use case: Expandable system for additional parameters/channels.

Connection: Connect each MPVS Duo BNC output directly to an RA-834 BNC input.



<u>MPVS Duo Output</u>	<u>RA-834 Input</u>
Pressure	BNC in 1 (A1)
Volume	BNC in 2 (A2)
Phase	BNC in 3 (A3)
Magnitude	BNC in 4 (A4)

Additional Channels:

If you want to route additional channels, use the DIN8 inputs on the RA-834.

Requires a BNC-to-DIN8 adapter to map MPVS Duo output voltages to the DIN8.

Optional Pressure #2 DIN8 in 5 (A5)

BNC to DIN8 adapter: iWorx sells a [C-BNC-DIN - iWorx Systems, Inc.](#)

LabScribe PVL Analysis Module

The [LabScribe PVLoop Analysis Module](#) can be used to analyze pressure-volume data from any source including conductance catheters, admittance catheters, echo ultrasound systems or sonomicrometry dimension crystals. Data from other recorders and compatible echo ultrasound systems can be imported into LabScribe using the import module for analysis. Pressure-volume (PV) loops have become the gold standard for studying myocardial contractility, compliance, muscle energetics and other quantitative measures of cardiac function. Typical applications for PV loops include heart failure studies, gene therapy and manipulation protocols and pharmacology studies.

Cardiac cycle parameters that can be monitored online:

Heart Rate, End Systolic Pressure, End Diastolic Pressure, Max Pressure, Min Pressure, Max dp/dt, Min dp/dt, Max Volume, Min Volume, End Systolic Volume, End Diastolic Volume, Stroke Volume, Cardiac Output, Ejection Fraction, Stroke Work

Further analysis can be performed offline, such as selecting cycles, calculating Pressure-Volume Area, Potential Energy, Cardiac Efficiency, and plotting PV Loops, PRSW, Max dp vs EDV, PVA vs EDV, PVA vs ESP, can be performed. The data and graphs can be copied or exported to the built-in Journal or any external program.

PV Loop Calculations:

Maximum and Minimum Volume, Diastolic and Systolic Volume, Stroke Volume, Cardiac Output, Ejection Fraction, End-Systolic Pressure Volume Relationship (ESPVR), End-Diastolic Pressure Volume Relationship (EDPVR), Preload-Recrutable Stroke Work (PRSW), Pressure-Volume Area (PVA), Arterial Elastance, Time-Varying Elastance, Maximum Power, Preload-Adjusted Maximal Power, Potential Energy, Cardiac Efficiency, Heart Rate Variability (HRV) Calculations

Plotting:

PV Loops, PRSW, Max dp/dt vs EDV, PVA vs EDV, PVA vs ESP, Time Varying Elastance, E(t) vs. time, Averaged PV loops

Detailed information about using the module is in the LabScribe Manual, accessed through the LabScribe toolbar by navigating to: Help – Help (Manual).