Claims:

1. A manifold module comprising:

a manifold base reversibly connectable to a pressure line containing pressurized fluid;

a first valve assembly mounted to the manifold base, the valve assembly comprising:

a cavity having first and second opposing inlet orifices and a single outlet;

a magnetic shuttle configured to travel within the cavity between the opposing inlet orifices;

each inlet orifice associated with a ferrous post surrounded by an electromagnetic coil, so that activation of the electromagnetic coil moves the shuttle toward the associated inlet orifice, occludes the inlet orifice and maintains the occlusion after de-activation of the electromagnetic coil;

a controller mounted to the manifold base and connected to the valve assembly;

the manifold base configured to fluidically connect a first pressure line inlet port of the manifold base to the first inlet orifice of the valve assembly, to fluidically connect the cavity of the valve assembly to a pressure sensing port of the manifold base, to fluidically connect the outlet of the valve assembly to an outlet of the manifold base, and to fluidically connect the pressure line inlet port to a pressure line outlet port of the manifold base;

the first valve assembly configured to be electrically actuated by the controller to either open or block communication between the first inlet orifice and the cavity of the valve assembly;

the controller comprising a pressure sensor mounted on a control board, the pressure sensor configured to form a reversible sealed connection with the pressure sensing port of the manifold base, the control board having one or more electrical output connectors for connection to the electromagnetic coil, and the control board having a first electronic communications connector for sending and receiving electronic communications to or from a communications bus on a first side of the manifold module, and having a second electronic communications connector for sending and receiving electronic communications to or from the communications bus on a second side of the manifold module;

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wherein the manifold module is configured to reversibly connect with a second manifold module via the first or second electronic communications connector and via the pressure line inlet port or the pressure line outlet port of the manifold base to form an expandable manifold.

2. The manifold module of claim 1, wherein the manifold base is configured to fluidically connect a second pressure line inlet port of the manifold base to the second inlet orifice of the valve assembly, and wherein the controller is configured to activate the electromagnetic coil associated with the first inlet orifice to close the cavity from the first pressure line inlet port and open the cavity to the second pressure line inlet port, and to activate the electromagnetic coil associated with the second inlet orifice to close the cavity from the second pressure line inlet port and open the cavity to the first pressure line inlet port.

3. The manifold module of claim 2, wherein the first pressure line inlet port is configured for connection to a first source of positive pneumatic pressure, and the second pressure line inlet port is configured for connection to a second source of pneumatic pressure that is less than the first source of positive pneumatic pressure.

4. The manifold module of claim 2, wherein the first pressure line inlet port is configured for connection to a source of positive pneumatic pressure, and the second pressure line inlet port is configured for connection to a source of negative pneumatic pressure.

5. The manifold module of claim 1, wherein the shuttle comprises an elastomeric layer on opposing sides facing the first and second inlet orifices.

6. The manifold module of claim 1, wherein the cavity includes cup-shaped inserts positioned against each inlet orifice, so that the shuttle is configured to move within the inserts between the inlet orifices.

7. The manifold module of claim 6, wherein each insert comprises a sealing flange, so that the sealing flanges are configured to abut each other.

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8. The manifold module of claim 6, wherein each insert includes an inlet fluid pathway adjacent the corresponding inlet orifice to permit communication between the inlet orifice and the cavity of the valve assembly, and an outlet fluid pathway to permit communication between the outlet and an internal volume of the insert.

9. The manifold module of claim 8, wherein each insert includes a valve seat surrounding the inlet fluid pathway to form a seal against the shuttle.

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