The SmartPlex® downhole control system is an electro-hydraulic multi-drop system that provides simple and reliable zonal control of multiple valves in a single wellbore with a minimum number of control lines. The SmartPlex downhole control system uses two hydraulic and one electric line from the surface to remotely and selectively actuate multiple downhole flow control devices such as interval control valves (ICV). This makes a large number of tubing hanger penetrations unnecessary and reduces operational complexity and risk.

The SmartPlex system can control any flow control tool in the field-proven Halliburton portfolio.

**Features**

- Three control lines for up to 12 downhole devices or four control lines for up to 24 downhole devices
- Minimal use of only passive and no active electrical components
- System can remain pressured when operating any of the ICVs in the same direction, significantly decreasing ICV actuation times
- Can be deployed with non-integrated systems and fiber optics
- Supports “fail-as-is” device types
- Independent of tubing or annulus pressure
- Can be used to position ICVs in choking applications

**Benefits**

- Helps reduce cost in multi-valve completions
- Faster activation time for valves
- Reduces rig time through greater-facilitation of completion installation and retrieval
- Electro-hydraulic system provides high level of motive power to operate ICVs
- In alignment with all of our ICVs, the system allows the ICV to be closed in a single step
- Provides the ability to move the ICV from closed to any choking position in a single step

**Application**

The SmartPlex downhole control system is applicable for any dry tree multi-zone completion requiring more than two valves. When compared to the Direct Hydraulics system, the SmartPlex system not only helps reduce the overall cost of an intelligent completion, but also reduces the complexity involved by minimizing the number of control lines required.

The SmartPlex system is ideally suited for long horizontal, compartmentalized completions (as deep as 30,000 ft), either cased or open hole, where selective control of each interval is desired. Typically this can be advantageous for selective stimulation control in tight gas applications or in combination with a choking ICV for drawdown optimization in production applications.
Operation
The SmartPlex system is a design that uses a simple passive electrical switching method. Each valve is coupled with a SmartPlex actuator module which allows selective and remote control of each valve. Control lines consisting of one electrical and two hydraulic lines run from surface and are networked to each SmartPlex module.

A signal down the electrical line switches a solenoid at a desired module, allowing hydraulic communication between the surface control unit and the valve. By regulating the fluid volume in combination with a time-domain control method, valves can be incrementally positioned (choking) to allow for advanced reservoir management.

Qualification and Field Testing
The SmartPlex control system has successfully passed extensive in-house deep well simulation testing. The tool has been cycled more than 10,000 times at high temperatures and pressures. A nine valve system integration test with 15,000-ft control line has also been successfully conducted.

The SmartPlex control system has been successfully deployed and field trialed in a multi-zone completion. Thanks to this system, the operator can now achieve maximum reservoir control from multiple laterals with minimum system complexity.

SmartPlex® System Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Temperature Rating</td>
<td>275°F (135°C)</td>
</tr>
<tr>
<td>Maximum Working Pressure</td>
<td>10,000 psi</td>
</tr>
<tr>
<td>Max Hydraulic Chamber Rating</td>
<td>10,000 psi</td>
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<tr>
<td>Control Line Connection</td>
<td>FMJ</td>
</tr>
<tr>
<td>Sizes Available (in.)</td>
<td>2-7/8, 3-½, 4-½, 5-½</td>
</tr>
</tbody>
</table>

For more information about the SmartPlex® downhole control system, contact your local Halliburton representative or email completions@halliburton.com.

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