

# LEAK DETECTION FOR LIQUIDS PIPELINES USING EXPERION® PKS EMBEDDED LDS

## Product Information Note

Built-in API RP 1130 compliant leak detection.

Make the most of embedded LDS technology as a standard part of your pipeline SCADA system.

The Experion SCADA liquids leak detection application is hosted as part of the Experion Server and allows organizations in the liquid transmission pipeline industry to use a computational pipeline monitoring (CPM) leak detection method to monitor their flow and pipeline performance by taking advantage of the embedded Leak Detection technology.

The Experion SCADA leak detection application uses the compensated volume balance method which is a type of leak detection system that is currently employed in pipelines around the world. This methodology infers the existence of a leak based on the balance of mass inside the pipeline segment, adjusted by the change in the line balance. The line balance in the Mass-Volume Balance calculation is based on calculations defined in API TR 1149. The solution also employs multiple Sequential Probability Ratio Test (SPRT) analysis methods over the line balance results to improve leak detection sensitivity and reduce the occurrence of false alarms.



*EXPERION® PKS embedded leak detection system for liquid pipeline simplifies 49 CFR § 195.134 compliance.*

### Key Features in Liquid LDS Offering

- API 1130 compliant as required by 49 CFR § 195.134
- Pipeline Hydraulic Model including pressure profiles
- Linepack Computation
- Leak Detection – Compensated Line Balance
- Leak Detection – Statistical Analysis
- Leak Location
- Static Leak Detection

## FEATURES & BENEFITS

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- |   |   |   |  |  |
|---|---|---|--|--|
| <ul style="list-style-type: none"><li>• Reduced system complexity and footprint. No need for another LDS server to buy, engineer, integrate and maintain.</li><li>• Simplifies compliance with 49 CFR § 195.134</li><li>• One service engineer can service or modify LDS and SCADA controls</li></ul> | <ul style="list-style-type: none"><li>• On process upgrades to future releases.</li><li>• Operates during steady state as well as transient conditions</li><li>• Suitable for single-phase liquids pipelines.</li><li>• Linepack, leak and operational data available to SCADA and other applications by default.</li></ul> | <ul style="list-style-type: none"><li>• Can be deployed on pipelines up to 100 miles / 160 km and up to 24" / 600 mm in diameter or on large pipelines based on Leak Sensitivity Analysis by Honeywell per API RP 1149.</li><li>• Easily scalable to include new additions to pipelines without interruptions</li></ul> | <ul style="list-style-type: none"><li>• Uniform engineering and operations environment for SCADA and Operational applications</li><li>• Uses flow, pressure, and temperature transmitters from SCADA, DCS, PLC or RTU.</li></ul> | <ul style="list-style-type: none"><li>• Pipeline Model is built using standard equipment templates covering all associated points, calculations, linepack, leak detection, batch tracking and leak location displays, trend definitions and alarms</li></ul> |
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## Computational Pipeline Model

The application leverages a pipeline model which reflects the physical pipeline system and is configured as Equipment points using Experion Configuration Studio. The pipeline model reflects real-world equipment such as meter stations, pump stations, pipeline segments and pipeline routes that reflect the components of the pipeline system.

## Linepack

Linepack is the amount of liquid volume in the pipeline and is calculated for each segment in the pipeline and summarized for the routes and pipelines in the pipeline model.

Manual override of pressure and temperature measurements is supported. The linepack is also displayed along with change indicators showing whether the linepack is increasing, decreasing or constant.

Equipment	Pa (Bar)	Pa Manual Override	Pa Field Value (Bar)	Ta (C)	Ta Manual Override	Ta Field Value (C)	Pa (Bar)	Pa Manual Override	Pa Field Value (Bar)	Ta (C)	Ta Manual Override	Ta Field Value (C)	Linepack Volume (m3)
PIPE_130_1301	75	<input type="checkbox"/>	75	33.05	<input type="checkbox"/>	33.05	80	<input type="checkbox"/>	80	42	<input type="checkbox"/>	42	954
PIPE_130_1302	80	<input type="checkbox"/>	80	33.05	<input type="checkbox"/>	33.05	85	<input type="checkbox"/>	85	47	<input type="checkbox"/>	47	988
PIPE_130_1303	85	<input type="checkbox"/>	85	33.05	<input type="checkbox"/>	33.05	90	<input type="checkbox"/>	90	52	<input type="checkbox"/>	52	1022
PIPE_130_1304	90	<input type="checkbox"/>	90	33.05	<input type="checkbox"/>	33.05	95	<input type="checkbox"/>	95	57	<input type="checkbox"/>	57	1056
PIPE_130_1305	95	<input type="checkbox"/>	95	33.05	<input type="checkbox"/>	33.05	100	<input type="checkbox"/>	100	62	<input type="checkbox"/>	62	1090
PIPE_130_1306	100	<input type="checkbox"/>	100	33.05	<input type="checkbox"/>	33.05	105	<input type="checkbox"/>	105	67	<input type="checkbox"/>	67	1124
PIPE_130_1307	105	<input type="checkbox"/>	105	33.05	<input type="checkbox"/>	33.05	110	<input type="checkbox"/>	110	72	<input type="checkbox"/>	72	1158
PIPE_130_1308	110	<input type="checkbox"/>	110	33.05	<input type="checkbox"/>	33.05	115	<input type="checkbox"/>	115	77	<input type="checkbox"/>	77	1192
PIPE_130_1309	115	<input type="checkbox"/>	115	33.05	<input type="checkbox"/>	33.05	120	<input type="checkbox"/>	120	82	<input type="checkbox"/>	82	1226
PIPE_130_1310	120	<input type="checkbox"/>	120	33.05	<input type="checkbox"/>	33.05	125	<input type="checkbox"/>	125	87	<input type="checkbox"/>	87	1260
PIPE_130_1311	125	<input type="checkbox"/>	125	33.05	<input type="checkbox"/>	33.05	130	<input type="checkbox"/>	130	92	<input type="checkbox"/>	92	1294
PIPE_130_1312	130	<input type="checkbox"/>	130	33.05	<input type="checkbox"/>	33.05	135	<input type="checkbox"/>	135	97	<input type="checkbox"/>	97	1328
PIPE_130_1313	135	<input type="checkbox"/>	135	33.05	<input type="checkbox"/>	33.05	140	<input type="checkbox"/>	140	102	<input type="checkbox"/>	102	1362
PIPE_130_1314	140	<input type="checkbox"/>	140	33.05	<input type="checkbox"/>	33.05	145	<input type="checkbox"/>	145	107	<input type="checkbox"/>	107	1396
PIPE_130_1315	145	<input type="checkbox"/>	145	33.05	<input type="checkbox"/>	33.05	150	<input type="checkbox"/>	150	112	<input type="checkbox"/>	112	1430
PIPE_130_1316	150	<input type="checkbox"/>	150	33.05	<input type="checkbox"/>	33.05	155	<input type="checkbox"/>	155	117	<input type="checkbox"/>	117	1464
PIPE_130_1317	155	<input type="checkbox"/>	155	33.05	<input type="checkbox"/>	33.05	160	<input type="checkbox"/>	160	122	<input type="checkbox"/>	122	1498
PIPE_130_1318	160	<input type="checkbox"/>	160	33.05	<input type="checkbox"/>	33.05	165	<input type="checkbox"/>	165	127	<input type="checkbox"/>	127	1532
PIPE_130_1319	165	<input type="checkbox"/>	165	33.05	<input type="checkbox"/>	33.05	170	<input type="checkbox"/>	170	132	<input type="checkbox"/>	132	1566
PIPE_130_1320	170	<input type="checkbox"/>	170	33.05	<input type="checkbox"/>	33.05	175	<input type="checkbox"/>	175	137	<input type="checkbox"/>	137	1600
PIPE_130_1321	175	<input type="checkbox"/>	175	33.05	<input type="checkbox"/>	33.05	180	<input type="checkbox"/>	180	142	<input type="checkbox"/>	142	1634
PIPE_130_1322	180	<input type="checkbox"/>	180	33.05	<input type="checkbox"/>	33.05	185	<input type="checkbox"/>	185	147	<input type="checkbox"/>	147	1668
PIPE_130_1323	185	<input type="checkbox"/>	185	33.05	<input type="checkbox"/>	33.05	190	<input type="checkbox"/>	190	152	<input type="checkbox"/>	152	1702
PIPE_130_1324	190	<input type="checkbox"/>	190	33.05	<input type="checkbox"/>	33.05	195	<input type="checkbox"/>	195	157	<input type="checkbox"/>	157	1736
PIPE_130_1325	195	<input type="checkbox"/>	195	33.05	<input type="checkbox"/>	33.05	200	<input type="checkbox"/>	200	162	<input type="checkbox"/>	162	1770
PIPE_130_1326	200	<input type="checkbox"/>	200	33.05	<input type="checkbox"/>	33.05	205	<input type="checkbox"/>	205	167	<input type="checkbox"/>	167	1804
PIPE_130_1327	205	<input type="checkbox"/>	205	33.05	<input type="checkbox"/>	33.05	210	<input type="checkbox"/>	210	172	<input type="checkbox"/>	172	1838
PIPE_130_1328	210	<input type="checkbox"/>	210	33.05	<input type="checkbox"/>	33.05	215	<input type="checkbox"/>	215	177	<input type="checkbox"/>	177	1872
PIPE_130_1329	215	<input type="checkbox"/>	215	33.05	<input type="checkbox"/>	33.05	220	<input type="checkbox"/>	220	182	<input type="checkbox"/>	182	1906
PIPE_130_1330	220	<input type="checkbox"/>	220	33.05	<input type="checkbox"/>	33.05	225	<input type="checkbox"/>	225	187	<input type="checkbox"/>	187	1940
PIPE_130_1331	225	<input type="checkbox"/>	225	33.05	<input type="checkbox"/>	33.05	230	<input type="checkbox"/>	230	192	<input type="checkbox"/>	192	1974
PIPE_130_1332	230	<input type="checkbox"/>	230	33.05	<input type="checkbox"/>	33.05	235	<input type="checkbox"/>	235	197	<input type="checkbox"/>	197	2008
PIPE_130_1333	235	<input type="checkbox"/>	235	33.05	<input type="checkbox"/>	33.05	240	<input type="checkbox"/>	240	202	<input type="checkbox"/>	202	2042
PIPE_130_1334	240	<input type="checkbox"/>	240	33.05	<input type="checkbox"/>	33.05	245	<input type="checkbox"/>	245	207	<input type="checkbox"/>	207	2076
PIPE_130_1335	245	<input type="checkbox"/>	245	33.05	<input type="checkbox"/>	33.05	250	<input type="checkbox"/>	250	212	<input type="checkbox"/>	212	2110
PIPE_130_1336	250	<input type="checkbox"/>	250	33.05	<input type="checkbox"/>	33.05	255	<input type="checkbox"/>	255	217	<input type="checkbox"/>	217	2144
PIPE_130_1337	255	<input type="checkbox"/>	255	33.05	<input type="checkbox"/>	33.05	260	<input type="checkbox"/>	260	222	<input type="checkbox"/>	222	2178
PIPE_130_1338	260	<input type="checkbox"/>	260	33.05	<input type="checkbox"/>	33.05	265	<input type="checkbox"/>	265	227	<input type="checkbox"/>	227	2212
PIPE_130_1339	265	<input type="checkbox"/>	265	33.05	<input type="checkbox"/>	33.05	270	<input type="checkbox"/>	270	232	<input type="checkbox"/>	232	2246
PIPE_130_1340	270	<input type="checkbox"/>	270	33.05	<input type="checkbox"/>	33.05	275	<input type="checkbox"/>	275	237	<input type="checkbox"/>	237	2280
PIPE_130_1341	275	<input type="checkbox"/>	275	33.05	<input type="checkbox"/>	33.05	280	<input type="checkbox"/>	280	242	<input type="checkbox"/>	242	2314
PIPE_130_1342	280	<input type="checkbox"/>	280	33.05	<input type="checkbox"/>	33.05	285	<input type="checkbox"/>	285	247	<input type="checkbox"/>	247	2348
PIPE_130_1343	285	<input type="checkbox"/>	285	33.05	<input type="checkbox"/>	33.05	290	<input type="checkbox"/>	290	252	<input type="checkbox"/>	252	2382
PIPE_130_1344	290	<input type="checkbox"/>	290	33.05	<input type="checkbox"/>	33.05	295	<input type="checkbox"/>	295	257	<input type="checkbox"/>	257	2416
PIPE_130_1345	295	<input type="checkbox"/>	295	33.05	<input type="checkbox"/>	33.05	300	<input type="checkbox"/>	300	262	<input type="checkbox"/>	262	2450
PIPE_130_1346	300	<input type="checkbox"/>	300	33.05	<input type="checkbox"/>	33.05	305	<input type="checkbox"/>	305	267	<input type="checkbox"/>	267	2484
PIPE_130_1347	305	<input type="checkbox"/>	305	33.05	<input type="checkbox"/>	33.05	310	<input type="checkbox"/>	310	272	<input type="checkbox"/>	272	2518
PIPE_130_1348	310	<input type="checkbox"/>	310	33.05	<input type="checkbox"/>	33.05	315	<input type="checkbox"/>	315	277	<input type="checkbox"/>	277	2552
PIPE_130_1349	315	<input type="checkbox"/>	315	33.05	<input type="checkbox"/>	33.05	320	<input type="checkbox"/>	320	282	<input type="checkbox"/>	282	2586
PIPE_130_1350	320	<input type="checkbox"/>	320	33.05	<input type="checkbox"/>	33.05	325	<input type="checkbox"/>	325	287	<input type="checkbox"/>	287	2620
PIPE_130_1351	325	<input type="checkbox"/>	325	33.05	<input type="checkbox"/>	33.05	330	<input type="checkbox"/>	330	292	<input type="checkbox"/>	292	2654
PIPE_130_1352	330	<input type="checkbox"/>	330	33.05	<input type="checkbox"/>	33.05	335	<input type="checkbox"/>	335	297	<input type="checkbox"/>	297	2688
PIPE_130_1353	335	<input type="checkbox"/>	335	33.05	<input type="checkbox"/>	33.05	340	<input type="checkbox"/>	340	302	<input type="checkbox"/>	302	2722
PIPE_130_1354	340	<input type="checkbox"/>	340	33.05	<input type="checkbox"/>	33.05	345	<input type="checkbox"/>	345	307	<input type="checkbox"/>	307	2756
PIPE_130_1355	345	<input type="checkbox"/>	345	33.05	<input type="checkbox"/>	33.05	350	<input type="checkbox"/>	350	312	<input type="checkbox"/>	312	2790
PIPE_130_1356	350	<input type="checkbox"/>	350	33.05	<input type="checkbox"/>	33.05	355	<input type="checkbox"/>	355	317	<input type="checkbox"/>	317	2824
PIPE_130_1357	355	<input type="checkbox"/>	355	33.05	<input type="checkbox"/>	33.05	360	<input type="checkbox"/>	360	322	<input type="checkbox"/>	322	2858
PIPE_130_1358	360	<input type="checkbox"/>	360	33.05	<input type="checkbox"/>	33.05	365	<input type="checkbox"/>	365	327	<input type="checkbox"/>	327	2892
PIPE_130_1359	365	<input type="checkbox"/>	365	33.05	<input type="checkbox"/>	33.05	370	<input type="checkbox"/>	370	332	<input type="checkbox"/>	332	2926
PIPE_130_1360	370	<input type="checkbox"/>	370	33.05	<input type="checkbox"/>	33.05	375	<input type="checkbox"/>	375	337	<input type="checkbox"/>	337	2960
PIPE_130_1361	375	<input type="checkbox"/>	375	33.05	<input type="checkbox"/>	33.05	380	<input type="checkbox"/>	380	342	<input type="checkbox"/>	342	2994
PIPE_130_1362	380	<input type="checkbox"/>	380	33.05	<input type="checkbox"/>	33.05	385	<input type="checkbox"/>	385	347	<input type="checkbox"/>	347	3028
PIPE_130_1363	385	<input type="checkbox"/>	385	33.05	<input type="checkbox"/>	33.05	390	<input type="checkbox"/>	390	352	<input type="checkbox"/>	352	3062
PIPE_130_1364	390	<input type="checkbox"/>	390	33.05	<input type="checkbox"/>	33.05	395	<input type="checkbox"/>	395	357	<input type="checkbox"/>	357	3096
PIPE_130_1365	395	<input type="checkbox"/>	395	33.05	<input type="checkbox"/>	33.05	400	<input type="checkbox"/>	400	362	<input type="checkbox"/>	362	3130
PIPE_130_1366	400	<input type="checkbox"/>	400	33.05	<input type="checkbox"/>	33.05	405	<input type="checkbox"/>	405	367	<input type="checkbox"/>	367	3164
PIPE_130_1367	405	<input type="checkbox"/>	405	33.05	<input type="checkbox"/>	33.05	410	<input type="checkbox"/>	410	372	<input type="checkbox"/>	372	3198
PIPE_130_1368	410	<input type="checkbox"/>	410	33.05	<input type="checkbox"/>	33.05	415	<input type="checkbox"/>	415	377	<input type="checkbox"/>	377	3232
PIPE_130_1369	415	<input type="checkbox"/>	415	33.05	<input type="checkbox"/>	33.05	420	<input type="checkbox"/>	420	382	<input type="checkbox"/>	382	3266
PIPE_130_1370	420	<input type="checkbox"/>	420	33.05	<input type="checkbox"/>	33.05	425	<input type="checkbox"/>	425	387	<input type="checkbox"/>	387	3300
PIPE_130_1371	425	<input type="checkbox"/>	425	33.05	<input type="checkbox"/>	33.05	430	<input type="checkbox"/>	430	392	<input type="checkbox"/>	392	3334
PIPE_130_1372	430	<input type="checkbox"/>	430	33.05	<input type="checkbox"/>	33.05	435	<input type="checkbox"/>	435	397	<input type="checkbox"/>	397	3368
PIPE_130_1373	435	<input type="checkbox"/>	435	33.05	<input type="checkbox"/>	33.05	440	<input type="checkbox"/>	440	402	<input type="checkbox"/>	402	3402
PIPE_130_1374	440	<input type="checkbox"/>	440	33.05	<input type="checkbox"/>	33.05	445	<input type="checkbox"/>	445	407	<input type="checkbox"/>	407	3436
PIPE_130_1375	445	<input type="checkbox"/>	445	33.05	<input type="checkbox"/>	33.05	450	<input type="checkbox"/>	450	412	<input type="checkbox"/>	412	3470
PIPE_130_1376	450	<input type="checkbox"/>	450	33.05	<input type="checkbox"/>	33.05	455	<input type="checkbox"/>	455	417	<input type="checkbox"/>	417	3504
PIPE_130_1377	455	<input type="checkbox"/>	455	33.05	<input type="checkbox"/>	33.05	460	<input type="checkbox"/>	460	422	<input type="checkbox"/>	422	3538
PIPE_130_1378	460	<input type="checkbox"/>	460	33.05	<input type="checkbox"/>	33.05	465	<input type="checkbox"/>	465	427	<input type="checkbox"/>	427	3572
PIPE_130_1379	465	<input type="checkbox"/>	465	33.05	<input type="checkbox"/>	33.05	470	<input type="checkbox"/>	470	432	<input type="checkbox"/>	432	3606
PIPE_130_1380	470	<input type="checkbox"/>	470	33.05	<input type="checkbox"/>	33.05	475	<input type="checkbox"/>	475	437	<input type="checkbox"/>	437	3640
PIPE_130_1381													

## Static Leak Detection

Static, or shut-in, leak detection is the process of testing for leaks while the pipeline is “shut-in” (i.e., flow is 0, and the pipeline is closed at both ends). The decay of the pressure along the pipeline is monitored for a period. A second test run is then performed - if the difference in pressure drop between the two tests are over the threshold, a leak is detected.

## Sensors Used

The following sensors are required for the Experion liquid leak detection solution.

- Pressure sensors at the pipeline supply and delivery, and optionally, at intermediate pump and valve stations along the pipeline.
- Flow meters at the pipeline supply and delivery.
- Temperature sensors at the pipeline supply and delivery.

## Robust Architecture

The liquid leak detection data is stored on the Experion servers and takes advantage of its redundancy capabilities to provide increased robustness.

## For More Information

Learn more about how Honeywell’s Experion SCADA can improve pipelines performance, visit [www.honeywellprocess.com](http://www.honeywellprocess.com) or contact your Honeywell Account Manager.

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The Honeywell logo, consisting of the word "Honeywell" in a bold, red, sans-serif font.