

FCoE Public Data Set 01 – September 2020

Summary

This data set contains readings from a wide array of instruments and actuators available on the **XCaliber flow Loop** at the **Flow Center of Excellence** in Dordrecht the Netherlands.

The data set contains 5, approximately 5 minute intervals of different operating regimes: 30 m3/hr., 60 m3/hr., 90 m3/hr., 60 m3/hr., 30 m3/hr., in semi-automatic control of the loop. Note that during the collection of the data set Pump 101 experienced cavitation.

License

This data set is licensed under the Community Data License Agreement – Permissive, Version 1.0 ([CDLA-Permissive-1.0](#))

More Information

More information on XCaliber and the Flow Center of Excellence is available at <https://www.flowcenter.nl/en/home-en/>

Required Citations

Huub Kleinrouweler & Jules Oudmans, FCoE Public Data Set 01 – September 2020, Flow Centre of Excellence & UReason, Dordrecht/Rotterdam, The Netherlands – www.flowcenter.nl and www.ureason.com.

Data Collection & Storage Info

Data was obtained from an OPC factory Server by Schneider Electric using UReason's APM-Studio. Original raw data format, stored by APM-Studio, is available in Microsoft SQL-Server.

Data Information

Key devices in the data set:

- | | |
|------------|--|
| 1. ATV_101 | : Frequency Controller (pump drive) for pump 101 |
| 2. ATV_PID | : PID controller for the ATVs (Altivar Process Variable speed drive) |
| 3. FT_100 | : Magnetic Induction Flow Transmitter (Main line) |
| 4. FT_102 | : Coriolis Flow Transmitter (mass meter , Main Line) |
| 5. FT_210 | : Magnetic Induction Flow Transmitter (MUT section A) |
| 6. FT_211 | : Magnetic Induction Flow Transmitter (MUT section A) |
| 7. FT_220 | : Magnetic Induction Flow Transmitter (MUT section B) |
| 8. FT_221 | : Magnetic Induction Flow Transmitter (MUT section B) |
| 9. P_101 | : Pump 101 |
| 10. PT_101 | : Pressure Transmitter (right after pump section) |
| 11. PT_201 | : Pressure Transmitter (just before pump section) |
| 12. TT_201 | : Temperature Transmitter (just before pump section) |

The P&ID (piping and instrumentation diagram) of XCaliber, is provided as part of the data set.

Key features in the data set:

Device	OPC-item	Description
1. ATV_101	ATV_101_ATV_ST.PresentValue	Drive RPM - process value
2. ATV_101	ATV_101_ATV_ST.SetPoint	Drive RPM – setpoint
3. ATV_PID	ATV_PID_PIDCTL_ST.OP	Drive frequency setpoint
4. ATV_PID	ATV_PID_PIDCTL_ST.PV	flow (primary value)
5. ATV_PID	ATV_PID_PIDCTL_ST.SP	flow setpoint
6. FT_100	FT_100_Calc_flow	flow (m3/hr; calculated)
7. FT_100	FT_100_KFact_Value	# puls /hr (KFact = 20000)
8. FT_102	FT_102_Calc_flow	flow (m3/hr)
9. FT_210	FT_210_Calc_flow	flow (m3/hr; calculated)
10. FT_211	FT_211_Calc_flow	flow (m3/hr; calculated)
11. FT_220	FT_220_Calc_flow	flow (m3/hr; calculated)
12. FT_221	FT_221_Calc_flow	flow (m3/hr; calculated)
13. P_101	P_101_Freq_OP	frequency (%) as set by drive
14. P_101	P_101_Run_CMD	status indicator (pump command running)
15. P_101	P_101_Running	status indicator (pump running)
16. P_101	P_101_SDDEVCTL_ST.PV	Motor/PUMP speed RPM
17. PT_101	PT_101_AINPUT1_ST.PV	process value (barg)
18. PT_201	PT_201_AINPUT1_ST.PV	process value (barg)
19. TT_201	TT_201_AINPUT1_ST.PV	process value (o C)

Data set type

Raw data – multiple conditions.

Sequence of Events

The system is running with 1 pump ; flow SP = 30 (m3/hr), base pressure: 0 barg

1. 14:43:38 start logging
2. 14:48:39 flow SP changed to 60 (m3/hr)
3. 14:53:48 flow SP changed to 90 (m3/hr)
4. 14:59:12 flow SP changed to 60 (m3/hr)
5. 15:04:18 flow SP changed to 30 (m3/hr)
6. 15:09:21 stop logging