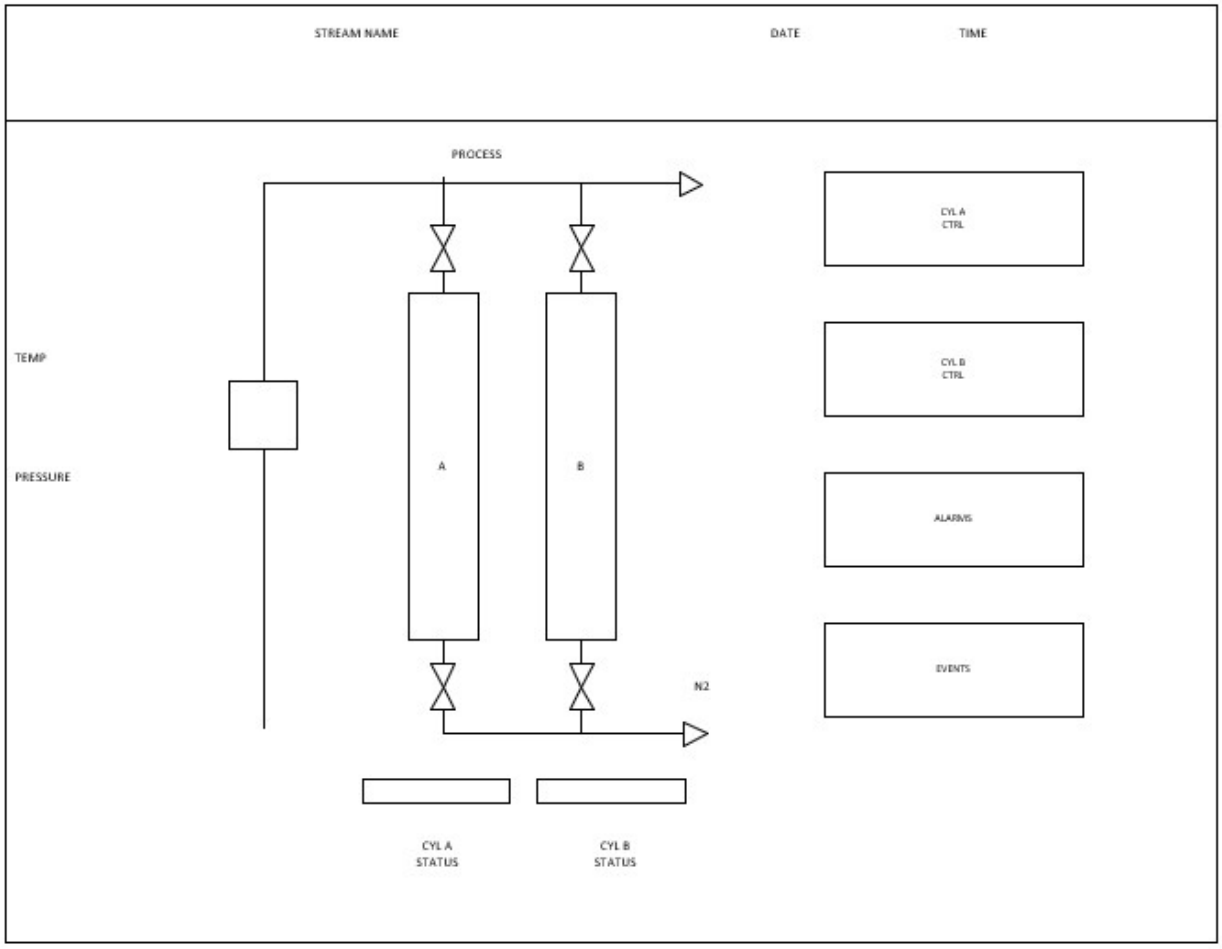
AUTOSAMPLE PANEL HMI CONCEPT AND NARRATIVE

As proposed, each 2-cylinder panel will have its own local HMI. The main display page will be configured to incorporate the following elements

Main Page



Banner – Stream/site name, Date, and Time. Registers have been provided to WRITE OBC time to system. HMI is time synced every 60 minutes when enabled.

Cylinder status – Removed, Ready, Filling, Full, Alarm

Valve status – Turn green on activation

Flow cell pressure and temperature - update every 10 seconds

Cylinder A control page access

Cylinder B control page access

Alarm status and history access

Event history access

Help Screen – Configuration parameters

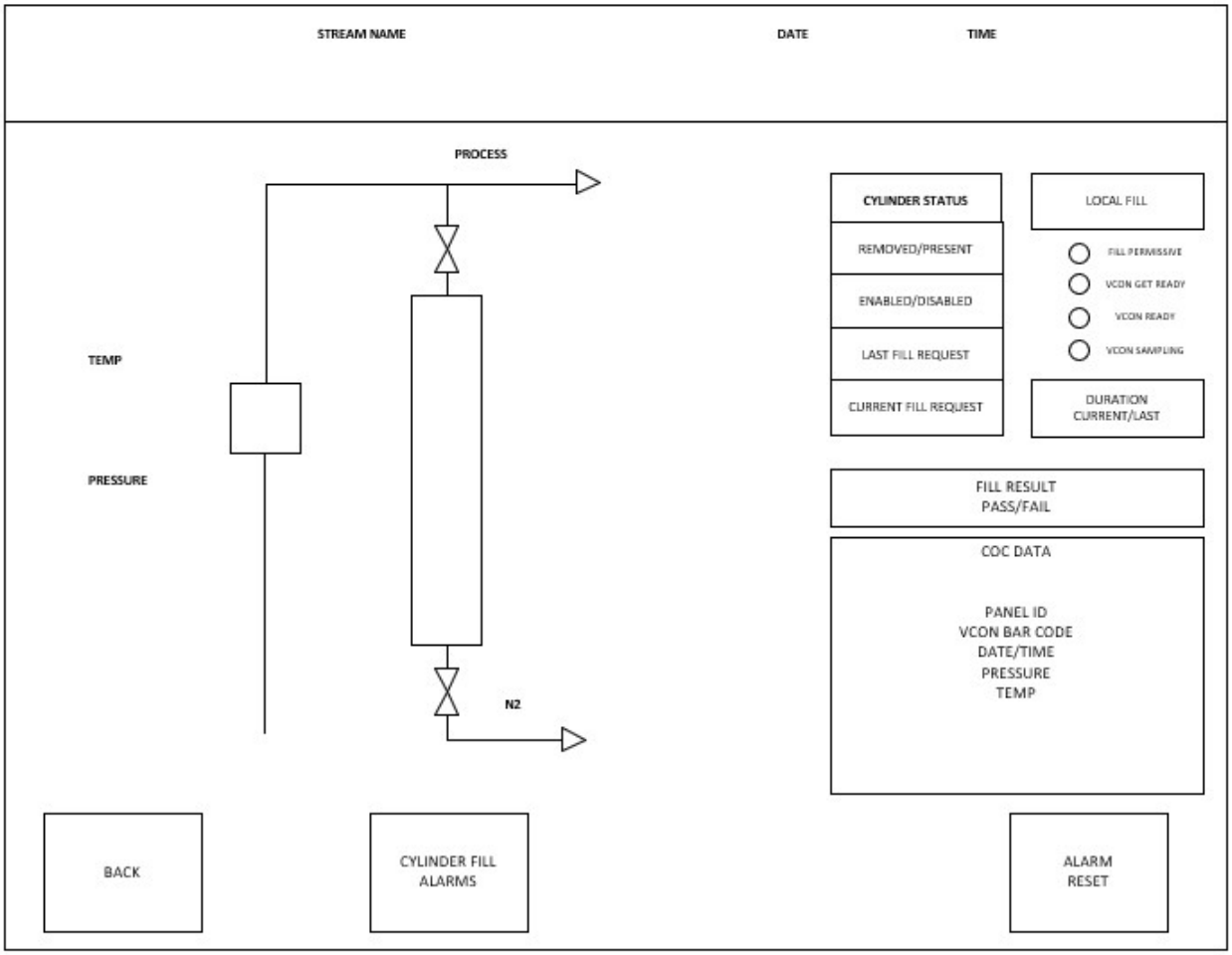
Cylinder Fills can be initiated via Modbus register or locally via the HMI. Local requests can trigger VCON to produce a bar code or as an option, bypass the handshake.

When triggered the system will attempt to collect a sample if there is an empty floating piston cylinder enabled.

When triggered, the system will select a cylinder to fill and ask VCON to GET READY. Once the VCON READY reply has been received, the panel will open the cylinder inlet valve and process fluid will purge the cylinder head for 15 seconds. After the purge is complete, the cylinder outlet valve will open and begin to bleed off the piston cylinder N2 precharge. When the precharge pressure is less than process pressure, the floating piston will start to move. As soon as the system detects the piston has moved from the EMPTY position, VCON SAMPLING is initiated.

When the piston hits the FULL limit (80%), the fill sequence is complete and VCON is signalled to go back to normal mode. The Chain of Custody data is collected and populated onto the HMI

Cylinder Fill Control page



From the individual cylinder control pages, the user can initiate a remote fill, collect COC info for lab analysis, add or remove cylinders to auto fill sequence, or enable/disable cylinders. Cylinder Fill alarms can also be viewed.

PRESENT/REMOVED: Used to indicate not available for autofill cylinder selection and no cylinders available alarm

ENABLED/DISABLED: The panel sensors must indicate the floating piston is installed and installed and precharged and cylinder alarms must be cleared to set to ENABLE.

Cylinder Fill Alarms:

- Fill too Fast – less than 60 sec (adjustable). Adjust N2 bleed rate
- Fill too Slow – more than 300 sec (adjustable). Adjust N2 bleed rate
- Fill Fail to Start – Piston Cylinder has not left the empty position 300 seconds after Fill request. Excessive pre charge or no reply to VCON handshake
- Empty Sensor Fault – Piston leaves the empty position and immediately returns. Indicative of loss of flow, vapour in process fluid, insufficient precharge or bad sensor.
- Maintenance Bypass: Panel switched from OPERATE to MAINTENACE mode during a fill attempt

DURATION: Time in seconds of current and last fill

FILL REQUEST: REMOTE, LOCAL, LOCAL w/VCON BYPASS

Alarm History

Panel alarm status:

- Hi/Lo Temp
- Hi/Lo Pressure
- Fill Failed
- Fill Failed/ Second attempt initiated
- No Cylinders Available
- Maintenance Mode

Alarm Log - Time stamped and stored to Micro SD Card for troubleshooting

Event Log – Time stamped and stored to Micro SD Card. Captures all request and valve actions and hand shake activities for trouble shooting.

HELP SCREEN – Configuration parameters

Procedure for local fill

Place a floating piston cylinder which has been precharged to 20% over line pressure into bracket and connect hoses.

From HMI access corresponding cylinder control page.

Change status from REMOVED to PRESENT. The cylinder alarms are now enabled. REMOVED status disables them

When the system senses the EMPTY precharged cylinder you can toggle status to ENABLED. The cylinder is now available for REMOTE or LOCAL fill requests

Observe Fill Permissive is Green and request a LOCAL FILL

Observe VCON GET READY STATUS.

Once VCON READY reply is received, the Cylinder Inlet valve will toggle and a 15 second purge of the cylinder head will start. After the purge, the Cylinder Outlet valve will open and allow the N2 precharge to bleed off. When the pressure has dropped below line pressure, the cylinder will start to move and trigger the VCON sampling state. The Fill duration timer will begin to increment.

At the completion of a Fill attempt, a PASS/FAIL result will be displayed. If it is a PASS, the COC data will be updated, and the Cylinder status will change to FULL. If it is a FAIL, the cylinder status will change to ALARM and will no longer be available for fill requests until reset.

Additional info

The system will attempt a second fill attempt on a FAIL only if there is a cylinder available.