Using the Rosemount 3420 for Tank Farm Monitoring

Products

Rosemount 3420 FIM
Radar Level – 5600
Pressure 3051S

Application

To monitor the level of Process Storage and Buffer Tanks mounted locally or in a remote area of plant.

Details

The 3420 allows up to 16 Emerson Foundation Fieldbus Transmitters to be connected to each of its 4 segments, allowing up to 64 devices to be connected to a single 3420 FIM.
4-20mA signals can also be interfaced via the Foundation Fieldbus segment using the 848T multi-channel transmitter. This is particularly useful for connecting device such as Weigh Scales or Analyser systems, allowing them to connected without the need for separate 4-20mA instrument cabling. Process Variables and their associated Status Alarms are communicated back to the Process Automation System using Modbus RTU.

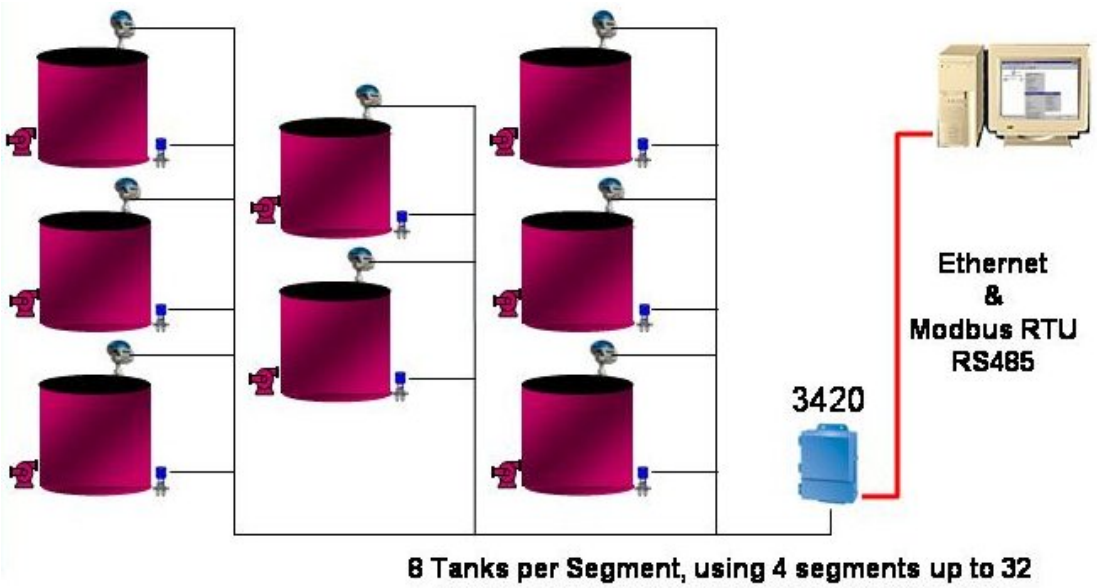
Tank Farm Monitoring

The 3420 FIM is ideal for the monitoring of Process storage and buffer tanks, it can be mounted in a Zone 2 environment close to the tanks and used to collect multiple Level, Pressure and Temperature values as required. The signals from each tank can then be fed back to the Process Automation System via the Modbus RTU network.

If each tank had a Radar Level and Pressure Foundation Fieldbus transmitter attached then this would provide 3 measurements as the Radar has a built in Temperature input.

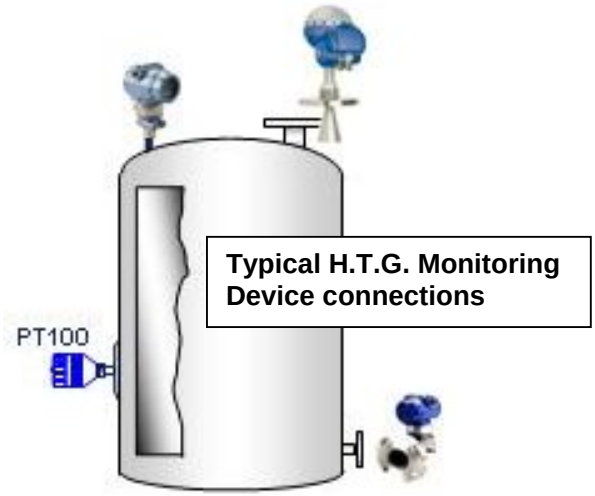
This would allow a segment loading of up to 8 tanks to be monitored per Foundation Fieldbus Segment, giving a full capability of 32 Tanks per 3420 FIM. The FIM provides all field power via the single twisted pair segment making installation simple and cost effective.

For very large numbers of Tanks, up to 31 x 3420 modules can be linked together on a single Modbus RTU network therefore giving a capacity of over 900 tanks per Modbus Network.



If Volume, Density and Mass are required from the Tank farm then an additional transmitter would be required to allow the calculations to be carried out.

The loading on the segment would then allow up to 20 tanks to be connected to a single 3420 FIM (5 per segment). All the process signals would then be connected back to the Process Automation System for computation.



3420 FIM Architecture Overview

The 3420 allows up to 64 devices to be connected via 4 Foundation Fieldbus segments (Shielded twisted pairs) these 4 segment cables are then brought back to the single junction box built into the 3420 FIM housing. The 3420 FIM provides DC power to the 4 Foundation Fieldbus segments, this provide instrument power to all connected devices and allow the device PV's and Status information to be communicated back to the 3420 FIM.

The 3420 internal WebServer is accessed using any PC either connected directly to the 3420 or Via a site LAN allowing global access to the information as required. All the connected devices can have their Process Variable and Status condition mapped to Modbus RTU registers within the 3420 itself. The registers can then be read by any Process Automation System that has a Modbus RTU serial Interface. Up to 31 x 3420 FIM's can be connected together on a single Modbus RTU, Multi-drop RS485 serial Network, allowing up to 1984 devices to be connected together on the Modbus Network.