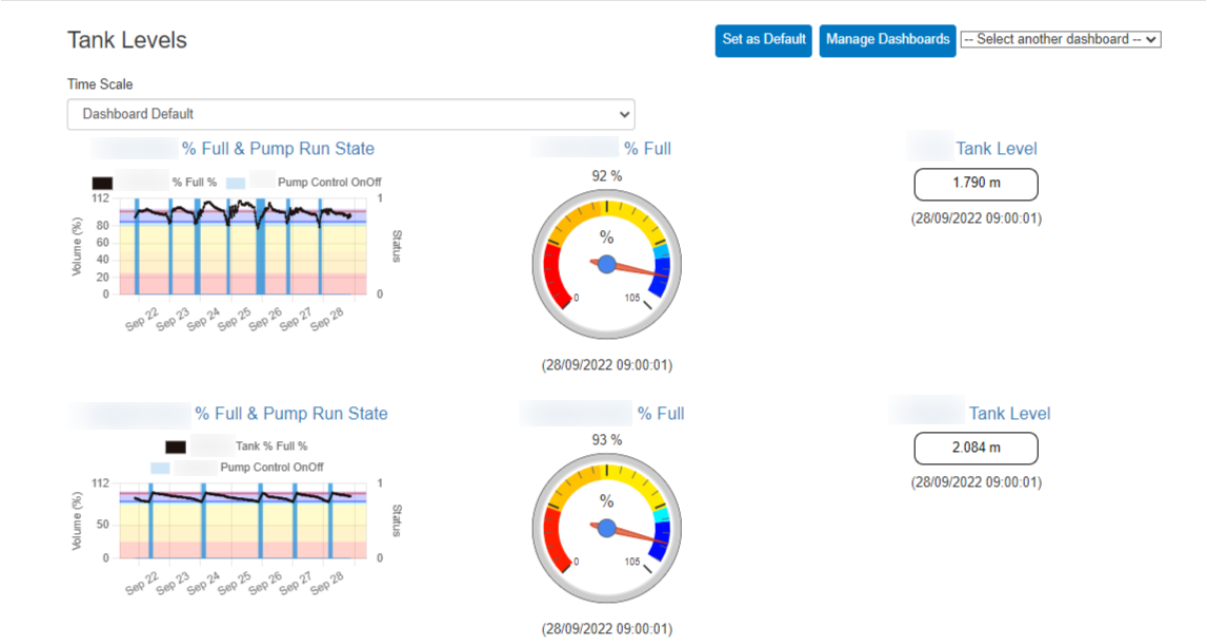
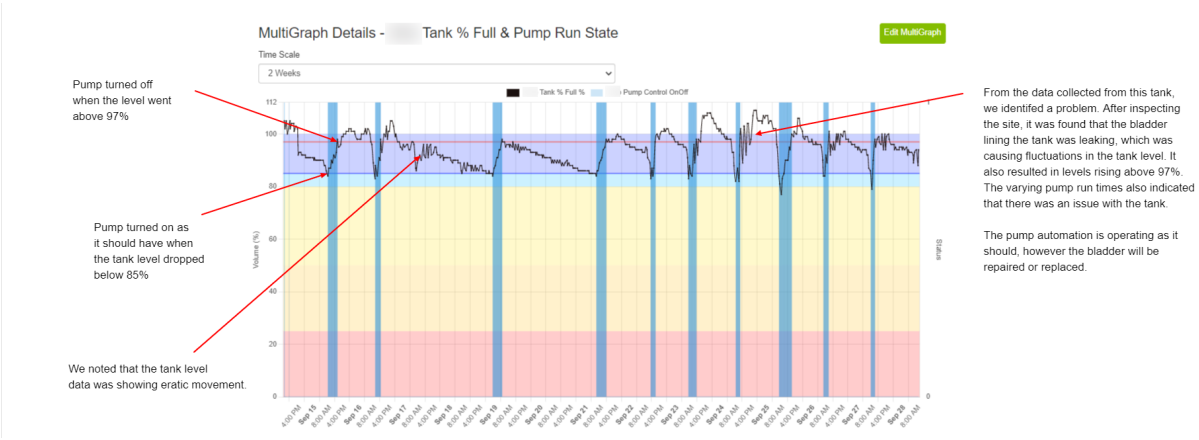
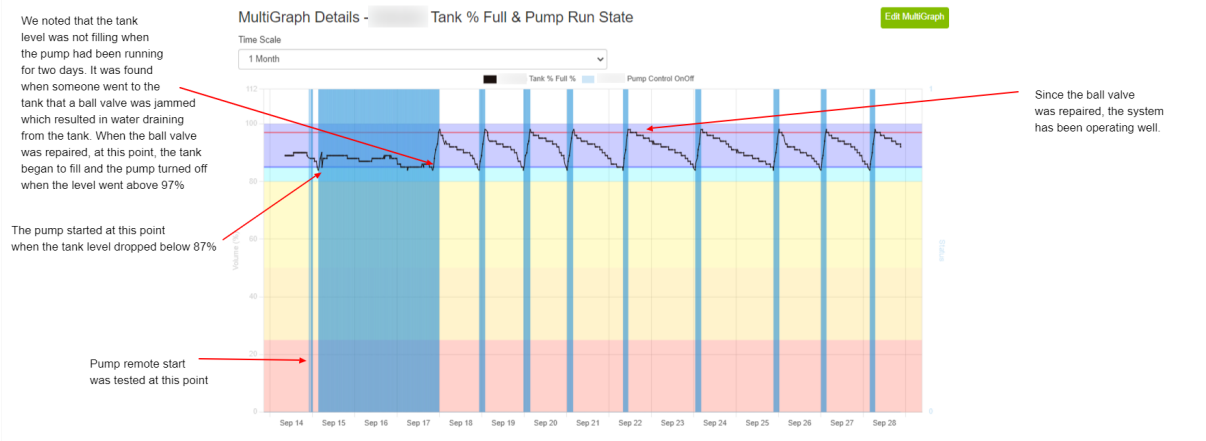
Tank Monitoring and Pump Automation Solution

MAC Systems recently supplied a system to a client that wanted to not only monitor water levels in two tanks, but also for the levels in the tanks to automate the operation of the two bore pumps that filled both tanks. The system we supplied comprised one site that operated as a “gateway” on one of the tanks. This site has a 4G CATM1 modem module and a radio module that connects to the internet and to the other three sites via radio. Two of the sites are monitoring tank levels and the other two sites are controlling the bore pumps. The control levels have been set to turn the pumps on when the tank levels drop below 85% and turn the pumps off when the tank levels rise above 97%. From the system the client can view the current run state of the pump and turn them off remotely if required. There is also an auto/manual switch at both pump sites, allowing manual operation of the pumps if preferred.

SMS and email alerts have been set at 80% and 50% levels as a safety back up that allows the pumps to turn off. The charts below show how the data is displayed with comments relating to each site. The system is working well. After a short period of time it has detected two problems that would otherwise have been missed.




MultiGraph Details - Tank % Full & Pump Run State
Edit MultiGraph
Time Scale
2 Weeks
Tank % Full %
Pump Control On/Off
Volume (%)
Status
Pump turned off when the level went above 97%
Pump turned on as it should have when the tank level dropped below 85%
We noted that the tank level data was showing eratic movement.
From the data collected from this tank, we identifed a problem. After inspecting the site, it was found that the bladder lining the tank was leaking, which was causing fluctuations in the tank level. It also resulted in levels rising above 97%. The varying pump run times also indicated that there was an issue with the tank.
The pump automation is operating as it should, however the bladder will be repaired or replaced.


MultiGraph Details - Tank % Full & Pump Run State
Edit MultiGraph
Time Scale
1 Month
Tank % Full %
Pump Control On/Off
We noted that the tank level was not filling when the pump had been running for two days. It was found when someone went to the tank that a ball valve was jammed which resulted in water draining from the tank. When the ball valve was repaired, at this point, the tank began to fill and the pump turned off when the level went above 97%
The pump started at this point when the tank level dropped below 87%
Pump remote start was tested at this point
Since the ball valve was repaired, the system has been operating well.