

Application Note

Pump Control Using MQTT

Scenario

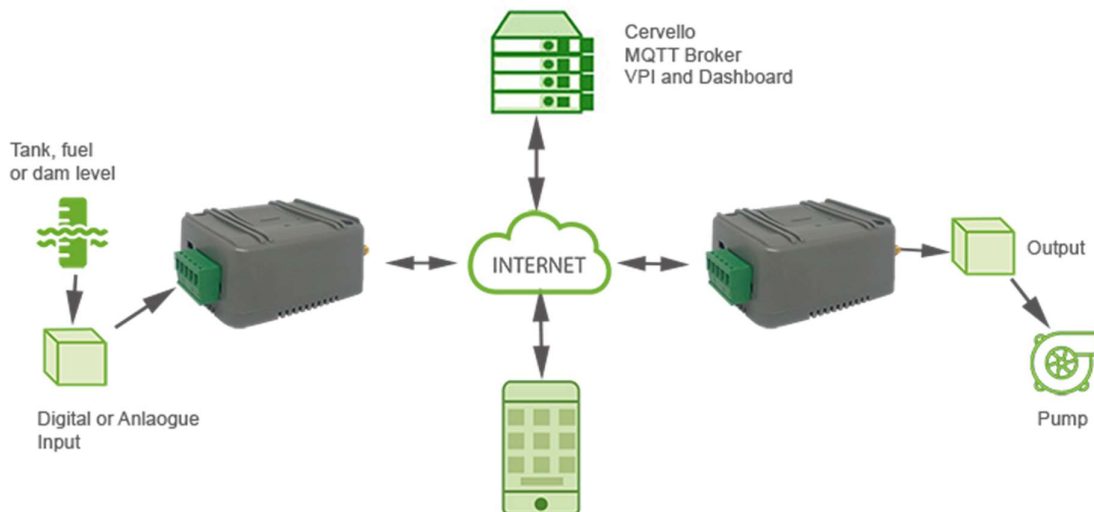
We wish to monitor a level in one location using either an analogue level sensor or float switch and switch a remote pump on/off depending on the level/float switch status.

The SIM card to be used is to be a standard private (NAT) dynamic IP SIM.

Solution

MTX-4G-JAVA-IoT (AUS) + MTX Tunnel Firmware + Cervello (MQTT broker)

(MTX Titan II routers, with appropriate accessories, can also be used)



The solution is to use the functionality in Cervello (Device Management/Programming Interface/MQTT broker) to monitor the state of the level unit and provide a start/stop command to the pump unit. The use of Cervello with MQTT allows for the use of standard dynamic private SIMs (eg telstra.internet).

Each modem will need to be loaded with appropriate config.txt files (settings) to enable communication with the MQTT broker (Cervello). Cervello's powerful VPI (Visual Programming Interface) will be used to establish the simple start/stop logic for the pump.

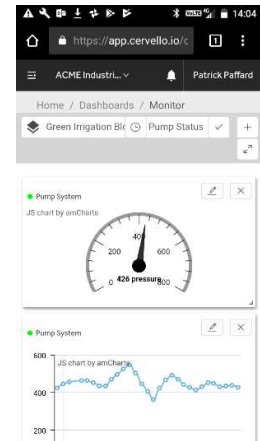
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Additional benefits of the Cervello solution with MTX modems include:

- Ability to create mobile friendly Dashboards with online access to system status information
- Ability to add logging of complementary information from additional sensors such as flow (water usage), pump pressure, energy usage etc
- Time clock functionality either in the modems or via Cervello to ensure pumps on run at certain times of the day (ie at times of lower tariffs).



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Configuration File for MTX Tunnel in MTX-4G-JAVA-T-AUS Modem

MTXTunnel Config:	
COMM_baudrate: 115200	Serial port baud rate
COMM_bitsperchar: 8	8 bit data
COMM_autocts: off	CTS flow control disabled
COMM_autorts: off	RTS flow control disabled
COMM_stopbits: 1	1 stop bit
COMM_parity: none	No parity
GPRS_apn: telstra.internet	APN from your network operator
GPRS_login: XXXXXXXX	Login for APN
GPRS_password: XXXXXXXX	Password for APN
GPRS_timeout: 0	Value 0 means MTX-Tunnel is GPRS always connected
MTX_PIN: 0000	If SIM card has no PIN security, use 0000
MTX_model: MTX-4G-JAVA-IoT-AUS	MTX-Terminal modem model used
MTX_mode: none	No gateway functionality required
MTX_urg: off	URC messages will not be sent
MTX_ping: 30	Time between pings in minutes
mTX_pingIP: 8.8.8.8	IP address for Ping
FIREWALL_enabled: off	Firewall disabled: Any incoming connection from any IP address is allowed
LOGGER_enabled: on	Logger enabled to allow GPIO status to be sent
LOGGER_registerSize: 1024	Logger register size, each register
LOGGER_numRegistersFlash: 500	Logger, num of registers
LOGGER_ioPeriod: 90	Logger IO period, in seconds
LOGGER_numRegistersRam: 3	No registers in RAM
LOGGER_mode: mqtt	Logger data sent by MQTT
LOGGER_mqttTopic: /IMEI/PumpSystem	Topic under which to publish pump IO data
MQTT_enabled: on	Enable MQTT service
MQTT_server: tcp://broker.cervello.io:1883	MQTT broker to be used
MQTT_id: 2cc7d7c9-d789-4e32-b96c-44206784683f	Device ID
MQTT_login: aimojpenwqpi2for	Device username or login
MQTT_password: z3ib8i41feca5707vouade643raeim	Device password
MQTT_qos: 0	MQTT quality of service setting
MQTT_keepalive: 300	MQTT keepalive setting
MQTT_attopic1: /XXXXXXXXXXXXXXXXXX	Topic to which this device will subscribe to receive AT commands, including relay on/off control
MQTT_atrtopic: /IMEI/ATResponse	Topic for sending device response to AT commands

Note: Actual config.txt files will not include headings or descriptions, below is how the file for the server unit should look.

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COMM_baudrate: 115200
COMM_bitsperchar: 8
COMM_autocts: off

COMM_autorts: off
COMM_stopbits: 1
COMM_parity: none

GPRS_apn: telstra.internet
GPRS_login: XXXXXXXX
GPRS_password: XXXXXXXX
GPRS_timeout: 0

MTX_PIN: 0000
MTX_model: MTX-4G-JAVA-IoT-AUS
MTX_mode: none
MTX_urc: off
MTX_ping: 30
mTX_pingIP: 8.8.8.8

FIREWALL_enabled: off

LOGGER_enabled: on
LOGGER_registerSize: 1024
LOGGER_numRegistersFlash: 500
LOGGER_ioPeriod: 90
LOGGER_numRegistersRam: 3
LOGGER_mode: mqtt
LOGGER_mqttTopic: /[IMEI]/PumpSystem

MQTT_enabled: on
MQTT_server: tcp://broker.cervello.io:1883
MQTT_id: 2cc7d7c9-d789-4e32-b96c-44206784683f
MQTT_login: aimojpenwqpi2for
MQTT_password: z3ib8i41feca5707vouade643raeim
MQTT_qos: 0
MQTT_keepalive: 300
MQTT_attopic1: /XXXXXXXXXXXXXXXXXX
MQTT_atrtopic: /[IMEI]/ATResponse