Caught on camera: Remote cameras can be put to all sorts of uses around the farm, from (left to right) checking stock watering points, monitoring pump water pressure, checking electric fence voltage, and tank water level.

Low cost remote control and telemetry

If you've ever wanted to check a cattle trough, the water level in a tank, or simply switch a pump on or off without leaving the house, there are now more choices than ever before. By **Josh Giumelli** with photos by **Ben White** and **Josh Giumelli**

Remote telemetry and control is becoming easier thanks to the proliferation of cheap, reliable wireless devices such as switches, cameras and motion sensors.

While these devices require a wireless network, the cost of providing a portable wireless network, through the use of a mobile broadband 'dongle', has never been cheaper. This workshop examines a range of low-cost remote control devices, as well as IP cameras for use in remote telemetry.

A wireless mobile device, loaded with a pre-paid SIM card, can be coupled with a wireless switch or camera. Add a power supply (eg battery and solar panel) and you have a remote device that can operate anywhere there is a mobile signal.

If you have 240v power on site, then control is fairly simple, provided you have mobile network. Simply plug in a remote switch (eg Belkin Wemo or Arlec power point controller) and a wireless dongle and link the two wirelessly. The switch can then be operated from a smartphone or tablet anywhere in the world (provided you have internet connection to your device as well). This can be used in a range of situations, such as controlling a pump, silo aeration fan or electric fence energiser.

Swap the switch for an IP camera and you have a remote telemetry system which can be used in almost limitless applications, once again provided you have a signal. Of course, any of the wireless devices featured in this article will operate near the home or office

utilising your local wireless network, without the need for a separate broadband device.

While using these ready-made controllers and cameras can save a lot of money, they are inherently less robust than purpose-built remote monitoring equipment, which is ruggedized, weather-proof, and less likely to fail. But as an entry-level solution, they make a great low-cost alternative provided you are prepared to tinker and iron out a few wrinkles.

The biggest drawback is they aren't much use if there is no mobile signal, although the use of high-gain antennas can help.

Note: Devices were sourced from Bunnings and Jaycar, but are readily available from online retailers as well.

1 If you simply want to control a power point without physically having to reach it, these Arlec remote control power outlets are ideal. They cost about $50 for three switches and the remote control, and are fairly typical of a range of similar wireless remote control units, although both the Arlec and Kambrook brands will not lose their wireless pairing in the event of a power failure. They operate using wireless, not infrared (IR) like a television remote control, so do not need to be pointed at the remote switch. Their range is about 30m, or less if there isn't a clear line of sight.

2 To set up a remote control switch, plug it into a power outlet, then plug your device into the switch (for example fan, shed radio, light etc). Turn the power outlet on. The red LED on the switch will blink slowly. Now hold down one of the power buttons on the remote for a few seconds. The red LED should flash quickly then turn off. The switch will now operate whenever number one is pressed on the remote. Note the device can be turned on and off manually by simply pressing the button on the switch unit.

3

To add additional switches, simply follow the same procedure, but hold down a different power button on the remote. You can actually power up several switches from the one button by assigning them all to the same number. Alternatively, press the 'All' button on the remote to turn on all switches at once (handy for lighting applications). Additional switches can be purchased separately.

4

Light fittings, such as the fluorescent batten pictured, can usually be purchased with a cord and 240v plug attached for self-installation. These work well for wiring up a workshop without calling on the local sparky. Simply connect all lights to extension cords, adding in remote switches where desired. This negates having to switch all lights on from a power outlet, which may not be conveniently located. You can also switch lights on in groups as desired, such as bays of a workshop or machinery shed.

5

This Arlec WiFi power point controller steps things up a notch, allowing you to control the switch using your smart phone. The switch does have to be in range of a wireless network, but can then be operated remotely with your smart phone or tablet provided you have internet access.

6

The first step is to download the Arlink app from the Apple App store or Google play. The app is free and should only take a second or two to download. Make sure your device (smart phone or tablet) is connected to the wireless network you will be using with the power point controller.

7

Plug the controller into a power outlet and switch the outlet on. The red LED should flash. Now open the Arlink app on your device. Follow the prompts to connect the power point controller to the wireless network. Note you will need to enter the network password.

8 Now you can plug your 240v equipment into the controller. It will handle a maximum current draw of 10 amps. Test the operation by switching it on and off through your device. The app will confirm whether the device has been successfully turned on or off. Several controllers can be added in a similar fashion and controlled through the app.

9 While your smartphone can operate the controller from anywhere, the controller has to be in range and connected to a local wireless network. If you want to operate a device such as a pump, lights or electric fence energiser away from an existing wireless network, you will need to connect it to a wireless dongle, which can then be placed near the switch, provided it has mobile network coverage. Plug the power supply for the wireless modem into a 240v outlet and leave it on at all times (ie not connected through the power point controller). Obviously the installation shown above should be housed in a protective casing for a permanent installation.


10 We've covered the use of a similar device, the Belkin Wemo, back in *Farming Ahead* November 2014. It costs around $60 and setup is very similar to the Arlec unit. It is controlled through the Wemo app (both Apple and Android platforms). Here we are using it to control an electric fence energiser.


11 Belkin also produces this neat IP camera. The standard definition unit as pictured costs $128, while a high definition version is available for $179. Both units can operate as stand-alone surveillance cameras, provided they are linked to a local wireless network, and a live video feed viewed over a smart phone or tablet. They do not need to be connected to a computer or other surveillance system.


12 To set up the camera, make sure you are in range of the wireless network the camera will be operated on. Plug the camera into a power outlet, and slide the rear switch up into the setup mode. If a wireless network is detected, the wireless LED should blink red.
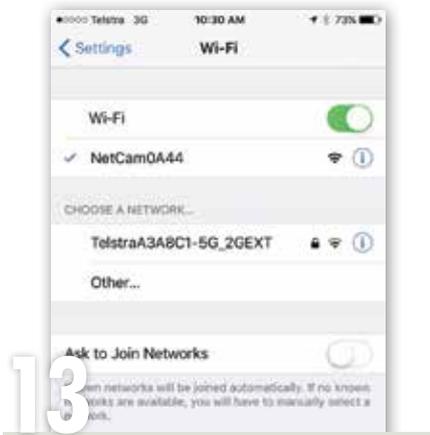
13 In your device's settings, connect to the Netcam's Wi-Fi signal. No password is necessary.
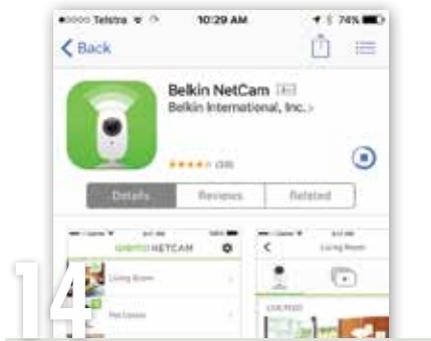
14 Next, search for the free Belkin Netcam app on the Apple app store (or Google Play) and download it. Launch the app and follow the prompts to complete the setup. You will need to create a login name and password in order to access the feed remotely.
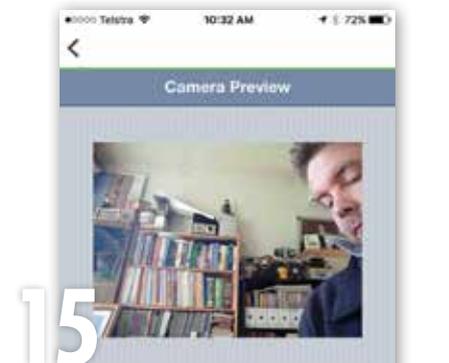
15 Now tap the play button to launch the feed from the camera. Note the app can record the video feed and also take still snapshots. Once you are satisfied all is working correctly, the camera can be put to work.

16 Here we focused the Netcam on our electric fence control panel. The fence status can now be checked from anywhere with a smartphone or tablet. Gallagher does have a remote monitoring system for their i series energisers which will alert you to a low voltage situation, but it is a very expensive option. Note the Belkin Netcam cannot be used outdoors unless housed in a suitable weatherproof housing.

17 There are several weatherproof IP cameras on the market which can be used in a similar way to the Netcam. These are ideal for setting up a remote monitoring system. The camera on the right features pan, tilt and zoom, allowing a wide range of viewing. Most cameras will be fitted with an IR sensor, allowing night viewing. Some are equipped with motion sensors, allowing images to be captured or alerts to be sent if movement is detected, making them ideal for security purposes. Kondinin Group will trial a selection of these low-cost IP cameras for a upcoming feature in *Farming Ahead*.