

AgCam Kit



Kit Includes:

- 1) 7" or 9" Monitor w/stand & Remote
- 2) Camera(s) w/ magnetic & hard mount
- 3) 60' & 20' Cables w/ watertight connectors
- 4) 6 pcs adhesive cable clips
- 5) External A/V Adaptor
- 6) 12v Power Adaptor (not pictured)
- 7) 1500mA A/C Power Adaptor (not pictured)

Monitors:

The display system for the DM AgCam is a custom-built 7" or 9" wide TFT Color monitor. 9" models come equipped with a built in digital TV Tuner.

FT technology is the newest flat screen technology available. Unlike a regular LCD monitor, the TFT allows a viewer to see accurate and clear images from a wide viewing angle to the monitor.

The AgCam monitors high quality screen will reproduce DVD and other video sources in a standard 4:3 screen size or 16:9 wide screen. Adjustable screen aspect ratio lets the user chose the right size and shape for their application. The reverse feature of the monitor allows for an accurate rear vision system, just like a rear view mirror the operator can use the AgCam for backing up trailers, campers and many other view interrupted equipment.

All monitors feature 2-camera capabilities. Switching from one camera to another is available with an A/V (audio/video) button on the front of the monitor or the handy credit card sized remote control. The monitor is specially wired to accept the single wire hookup to the AgCam cameras with a sealed, watertight, twist lock connector. To allow for easy hookup, the only power source required is a single A/C adapter or cigarette lighter adapter for both camera(s) and monitor (kit includes A/C power adaptor and cigarette lighter power adaptor). The monitor can also be wired into a vehicle wiring harness with our available hardwire power adaptor to an accessory on circuit.

Cameras:



- 1) 100% waterproof triple o-ring sealed housing
- 2) Solid aluminum housing
- 3) Exclusive auto shading lens
- 4) Automatic infrared illuminators
- 5) 45lb pull mounting magnet
- 6) Low profile adjustable mounting bracket
- 7) Stainless steel hex head screws

The DM AgCam uses a unique camera that has been engineered to withstand most harsh environments with ease and reliability. Featuring a completely waterproof housing, rated at IP69, an advanced 1/3" Sony Super HAD CCTV imaging sensor with 540 lines of resolution and twin color/black & white imaging boards, this

camera can be used in a variety of situations producing excellent results. The real beauty of the camera system is its ability to easily migrate from one application to another using a single wire hookup and a strong magnet.

The color portion of the camera is a very low light imager sensitive to below .01 Lux, and the 12 built in high output infrared emitters allow for viewing up to 40 plus feet in complete darkness. The camera will allow for immediate transfer from a bright lit to very dark environment without any interruption in high quality picture. The front of the camera features an exclusive photo chromatic lens with auto darkening properties, which, even when at its darkest, is invisible to the infrared emitters, allowing the user to go from bright sunlight to complete darkness with no sacrifice of quality or sharpness. This is the same glass used in the most expensive prescription glasses and is an exclusive of the AgCam system. In very bright sunlight the glass darkens and in the low light it becomes clear. This is a feature which allows the user to see high quality images even looking directly into the sun. Finally, the camera housing is an extremely strong, waterproof, solid anodized aluminum housing with all natural rubber O-ring seals mounted on top of a ceramic POT magnet which has a 45 Lb pull strength. It's low profile makes it easy to find an appropriate mounting location.

Custom lens cameras are also available to increase your field of view or focal distance. Cameras need to be purchased with the custom lenses installed to ensure the integrity of the camera. See our documentation page for a lens selection guide.

Cables:

Each AgCam Kit includes a 20' and a 60' cable. Our silicone jacketed cables are very flexible, waterproof, oil resistant, video ready and shielded. The terminations are rubber sealed 5 pin connectors with a ¼ twist lock. Two different length cables are included in a standard kit for such applications as a tractor where there will be a quick disconnect at the hitch, or an application where a shorter cable is desired. Lengths may be added at any time for a maximum of 160 feet (custom lengths are also available as an accessory). Our cables are among the least expensive on the market, yet maintain very high quality.

If you require lengths longer than 160 feet, you can use our accessory AgCam Balun video extenders, allowing users to utilize Cat5E cable and extend cable length up to 2500'.

Additional optional cable lengths include 10', 20', 40', 50' and 60'.

Warranty:

All cameras are warranted for a period of 3 years from the date of sale.
All monitors are warranted for a period of 2 years from the date of sale.
All other components are warranted for a period of 1 year from the date of sale.

AgCam Ranch Hand Wireless Transmitter/Receiver Pair

[FCC Grant Certification available on Documentation Page](#)



Kit Includes:

- 1) Ranch Hand Wireless Receiver, 3-Channel
- 2) Ranch Hand Wireless Transmitter, 3-Channel
- 3) 2pcs 3dB antennas
- 4) 2pcs Mounting Brackets w/ screws
- 5) External RCA Adaptor, allows input into standard VCR or TV
- 6) 1500mA A/C power adaptor for

- Transmitter (not pictured)
7) 300mA A/C power adaptor for Receiver (not pictured)
8) Hardwire power adaptor (not pictured)

Wireless Ranch Hand Pair

The Ranch Hand is a wireless add-on to the AgCam system using 2.4Ghz frequency at 100mw of power. Simply attach the receiver to your AgCam monitor using a single wire, and attach the transmitter to the AgCam camera in a remote location up to 2500 feet away (line of sight required). Alternately, you can attach the receiver (via RCA jacks on the front of the units) to any TV or VCR set with an AUX input. The range of your Ranch Hand can be greatly increased with the addition of one of our accessory antennas listed below.

Waterproof Ranch Hand Transmitter



The Ranch Hand waterproof transmitter is a completely sealed unit that can be mounted outdoors in the elements. This unit offers users the ability to transmit from areas where there is extremely high humidity, such as heavily populated barns, or directly outdoors in the rain, snow and sun.

The RH waterproof transmitter includes a 1500mA A/C adaptor and a 3dbi antenna. It can be purchased separately, or in a kit with a standard receiver.

Wireless Ranch Hand Easy Switch Receiver



The Ranch Hand Easy Switch receiver allows users the ability to easily switch between the 3 available channels.

Ranch Hand Accessories

Dakota Micro offers a variety of accessory antennas and antenna extension cables to enable transmission outside of steel buildings or over distances up to 4 miles (depending of line of sight).



5dB Gain antenna (Magnetic mount)

Our 5dbi gain antenna is a omni-directional antenna designed for use on vehicles or equipment, and can extend the range of our wireless signal up to over 1/2 mile. It is ideal for situations where the length of equipment makes it difficult to run cables (although power must be supplied to the transmitter in any case). Both transmitter and receiver are required to have the same antenna to

obtain maximum range. Magnetic mount makes for quick installation and removal.

Includes 6' antenna cable. Antenna extension cables are not available for this antenna.

8dB Gain antenna (Unidirectional)

The most popular antenna is our 8dbi gain omni-directional antenna. Where an external antenna is needed or to simply extend the range of your Ranch Hand, this antenna will cover most applications. The range will extend from 2500 ft to approximately 1.5 miles. The maximum range is again considering line of site; any obstructions will reduce that range significantly. Tree shelters, other buildings, ground terrain and other considerations must be observed when selecting a location.



Some custom combine outfits have been using the 8dbi antenna on combines, grain carts and trucks with excellent results. The extended range allows the grain cart operator to monitor the hoppers on each combine. By adding extra receivers others also will be able to monitor the same event. Transmitters have 3-channel capability so the limit is 3 within the range of the antenna, although the receiver will only select the strongest signal, therefore the possibility of interfering with another Ranch Hand user, or being overpowered by another ranch hand transmitter is unlikely.

Includes 20ft antenna cable. 20' and 80' antenna extension cables are available for this item.

8dB Panel Mount antenna (Directional)



We also offer a directional, panel mount 8db antenna. This antenna offers superior transmission capabilities when static transmission and reception points are available.

The most common uses for this antenna include calving/foaling/farrowing barns, grain dryer monitoring and remote site monitoring.

Includes 20ft antenna cable. 20' and 80' antenna extension cables are available for this item.

15dB Gain antenna (Yagi Style)

If stronger signal strength is needed to extend the range even farther our 15dbi antenna may be the choice for your application. At 15dbi increase in signal, your range



will extend to a maximum of 5 to 6 miles. This antenna is focused in a smaller beam so it will only direct the signal where you want it. This type of antenna requires that you direct the signal in the direction where you intend to receive it, also line of site is required. Ranchers monitoring remote feedlots and farmers observing the operation of irrigation system miles away have experienced excellent results. Since the antenna must be fixed in place, this antenna is a good choice for site-to-site observation but would be a bad choice for moving objects such as farm equipment or other type of vehicle. Observe line of site rules when selecting a location.

Includes 20ft antenna cable. 20' and 80' antenna extension cables are available for this item.

Helpful Tips for Wireless Setup

Over the past couple of years people have been installing the Ranch Hand wireless system to enhance the usefulness of their AgCam system. We have helped to solve many wireless problems and so it was decided that we should put in a section to help people understand some of the fundamentals of using and installing a wireless system. In most cases the Ranch Hand wireless system will surpass any user's expectations, especially if they have had experience with some other systems with less technology and power.

Although most systems will function flawlessly over fairly long distances there have been a few areas which a perfect signal is simply impossible to achieve even in what would seem to be ideal conditions. These situations are few and far between, however it has been discovered that our headquarters is one of those situations. We are uncertain why the heart of the facility and the immediately surrounding area is flawed to wireless transmission, it is theorized that it may be some geological feature or some unknown radio signal or even possibly some sort of radio interference from high powered transmission lines which cross the country. Whatever it is, it was certainly helpful in creating the most perfect wireless unit allowed by FCC limitations of frequency use without a license.

Choosing locations

Sometime it is difficult to choose a location which will allow for unobstructed line of sight, survey the area and chose a location where you may attain the clearest shot to the area where your receiver will be. When you first install the system don't automatically assume that the first location would be the best, it is often found that moving the transmitter location (antenna particularly) even a few feet or inches can make a world of difference. Radio signals

bounce off of buildings and walls, remember what you see when you see a radio tower for a TV station in the middle of nowhere, there is a reason why they are so high and in remote areas, aside from the fact that they don't want them to fall on any populated area, it simply is the best location for successful transmission without interference.

Antenna Location

There are several common misconceptions about installing an antenna for a wireless video link. Most of the installation problems we have solved were because of improper installation or placement. In short ranges it is not necessary to put the antenna very high. If the antenna is in the same yard and transmitting only a few hundred feet, most antennas will only need to be 10 to 15 feet high at the most.

One thing to keep in mind is the position of the antenna relative to a building, if the antenna is mounted on the side of a building which faces the direction of transmission it will have poor performance, It is better to get the antenna up above the roof line where it is in clear of the building or put the antenna around a corner so that there is no obstruction. for example: if you were to draw a straight line between the receiver and transmitting antennas you should be able to draw past the antennas without hitting a solid object. If it is impossible to get that clear line past the antennas, do your best to offset the antenna away from the building as far as possible, 10 inches from the wall of a building will perform much better than 3 inches, but 24 inches will be even better.

Antenna Selection

Choose the proper antenna for the distance and then factor in any possible obstructions. Mathematically it is theoretically possible to achieve very long distances with the proper antenna. However in our tests we have downgraded the mathematical possibilities significantly.

If you have a building which you would like to monitor within a typical sized farm yard (200 to 300 yards range) it is quite conceivable that using only a small 5dbi gain antenna would do the trick well, and of course the only reason to use an external antenna is to avoid the building obstruction.

In longer ranges within a farmyard the 8dbi gain antenna will perform very well.

When transmitting longer distances such as monitoring a remote farm or building site, it is preferable to use the directional antennas such as the Panel mount 8dB or the 15dB Yagi. These type antennas focus all of the power in a single direction and also are higher gain antennas, they will perform across 5 miles or more well.

Mount the antenna suitable to its design. Here are some particulars for each antenna

5 Dbi magnetic. Mounts on any steel surface, no real requirements here other than having no surface obstructions in any direction horizontal to antenna.

8 Dbi Omni. This antenna is designed to be mounted on a pole which is grounded, be sure to mount the antenna at the highest point of the pole or offset it from a pole or tower by at least 18 inches. The grounded metal of the pole is part of the antenna; the pole should be at least 4 ft in length minimum but longer would be better. Height is important, and the antenna should be mounted at least 15 feet off the ground, rough terrain and ground clutter seems to lower it's distance significantly when it's mounted lower than 15 ft.

15 Dbi Yagi. Designed to be mounted on a grounded pole but works very well when attached directly to a steel building on a corner, not on the flat surface of the side of a building. Best if mounted on a pole without any reflective surfaces nearby. Height is relative to it's required distance and obstructions, works well within 3 feet of ground across many types of terrain.

The Exceptions to the rules

Obstructions will change all the rules for selecting an antenna. Where a Yagi 15 Dbi gain antenna would work across 12 or more miles, a single belt of trees will reduce that range to small distances or not work at all. Trees are very dense and wet, they will tear apart a radio signal and render it useless, in the winter months when there are no leaves, the trees are nearly transparent to radio signals. Often cattle producers will enjoy clear video in the spring while calving is occurring, where the summer months the signal is diminished due to leaves on the trees, but mostly the cameras find themselves on a tractor by that time. In situations where you need to clear trees to attain line of sight you may consider using a Yagi antenna for even short ranges of a few hundred feet, the tight focus of the signal may penetrate the trees enough to produce a good signal.

Buildings are mostly not a problem but can be, metal skin on a building can block a signal and also reflect it in different directions. Reflected signals are also picked up by the receiver but in a slightly different time, this will cause a horizontal flicker, which persists. What is happening is that the PLL synthesizer is trying to focus itself on the most stable signal, having the presence of a random and unintentional signal will cause the receiver to constantly wonder looking to see if it can improve the signal strength. Once again to improve this you may need to use a focusing antenna such as a Yagi, an omni directional antenna like the 8dbi and smaller transmit their signal in all directions allowing the signal to bounce. Also try to change the direction of the Yagi, even if it appears to be slightly out of direct line of sight it has improved signal in some situations. If all else fails move the antenna to a different location, sometime luck will help a bit.

Chose a larger antenna than the longest range you need. If you want to transmit a signal across 5 miles you may be tempted to use an 8dbi antenna, which is capable of 5 miles in good conditions, however, it is much safer to assume that your conditions are not ideal and chose a 15dbi Yagi. In a situation where you need to receive a signal from several directions the 8dbi antenna is very good within the 3 to 4 mile range, beyond that you may want to consider another solution. We also offer an Internet video server solution for situations where there is no possibility of getting a wireless signal to work sufficiently. In a long-range setup it is necessary to install the same antenna on both ends to achieve maximum range. This is not true within shorter ranges, if you are using a Yagi antenna to penetrate trees or buildings it is often acceptable or even better to use a 5 Dbi antenna, this will save money in a lot of

situations and frankly the 5 Dbi antenna looks a heck of a lot better on the entertainment center than a Yagi.

Cable Length

OK so you have decided that you need a longer cable to get over the trees or on top of a grain bin, we offer a 20ft and an 80ft extension cable for antennas larger than the 5 Dbi magnetic antenna. This will allow for a total of 40ft or 100ft of cable, but it is not the best solution in all situations. As a rule you should limit the range of the antenna cable to the shortest possible length as the cable will lose signal across longer distances of cable. The higher the Dbi gain of the antenna the less this is important. The 5 Dbi antenna is equipped with only a 6 ft cable, there is no extension available for this antenna as the signal loss would be too great for the small amount of signal boost. If you have a need to have more antenna cable to get the transmitter in an ideal location you may have to consider using a waterproof ranch hand so it can be mounted outside in the elements. Cable length is more important on the receiver than it is on the transmitter, the receiver is only getting power through the antenna from radio signals in the air, the power is minute and can be lost completely with too much cable.

Flicker within the same room or building.

The most common problems within a building can be not so much a problem for the Ranch Hand as other equipment. Some equipment such as wireless phones and wireless network systems can cause problems for the video signal or stop working well or at all themselves. If this is the case you may want to try changing the channel on the transmitter and receiver, which also applies to all other problems, this should be one of the first things to do in any attempt to clear up any signal problems. Another way to reduce these problems is to change the location of the transmitter; this can be easily done using the camera extension cables.

Whenever possible use the wires!!

It is sometime tempting to simply set up a wireless unit rather than running a wire. As a rule if the distance is within 100 to 150 ft and the two points of observation are connected, it is always best to use a wired system. Wireless is fantastic where it is unpractical to run wires but it will always be a better and clearer video if you can use wires. From tow vehicle to a trailer for example, spend the time to install a cable, the results will be better and you will be happier with the system in the long run.

Vehicle to Vehicle

This is fun and useful. Combine to grain cart, beet lifter to truck, forage harvester chute to truck and many other uses. The 5dbi antenna is a very good magnetic mount antenna, which will allow for transmission across more than a mile. In most farm fields there are very little

obstructions and is an ideal environment for wireless viewing. There are many custom combine operations that are using the AgCam/Ranch Hand combination between grain cart or truck to combine hoppers, it is usually an easy installation and proves to be a significant time saver during harvest. Using an 8 Dbi antenna can increase the range and clarity but is usually not necessary.

TV tuner antenna for monitor

For several months now we have been asked to offer an external TV antenna for the monitor (7" and 9" monitors with tuner). We have tested many many models of Mobile TV tuner antennas, in fact over 25 of them were tested in several vehicles and different locations. The results were the same every time, there is no significant gain using any of the tested models of antennas over the rabbit ear antenna, which is built into the TV tuner. In fact most antennas made reception worse. The problem with an antenna mounted in a static location on a vehicle is that the vehicle will always change its location and direction of travel. Some directions the antenna will work well while others it is difficult to get any signal at all. As a universal rule the reception was always better with the standard installed antenna and there seemed to be less sensitivity to direction. We will not be adding an external TV antenna to the product offering until we find one, which will improve the performance of the TV tuner. There is available from Radio Shack and other electronics stores several optional antennas that you may try if you need to simply have an external antenna due to cab space restrictions or other reasons. The 7" and 9" monitors with TV tuner built in make a nice Kitchen or Office TV, simply get a RF to 1/4" plug from Radio Shack to connect your AgCam Monitor to the your home cable system.

If anybody finds a suitable mobile TV antenna which works well please let us know and we will certainly test it.

AgCam Full Color Quad Processor



Kit Includes:

- 1) 1500 mA A/C adaptor
- 2) Hardwire Power Adaptor
- 3) Full Color Quad Processor

Quad

Standard features

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Fully compatible with all AgCam and Ranch Hand components.

- Independent title setting, up to 8 characters, for every channel.
- Automatically detects unconnected channel, and skips that channel in auto-switch mode.
- Single channel audio enabled.
- Picture in picture function.
- Split screen function.
- Freeze individual camera function.
- Video signal loss detection produces sound by built-in buzzer.
- Independent bright, contrast, color and sharpness adjustments for every channel.
- Provides VCR-IN to support 2x2 zoom-in and freeze function for playback.
- Smart auto switcher, random sequence and dwell time are supported.
- Full quad display at real time refresh rate (60 frames/sec).
- No borders for full quad display.
- Built in timer and title generator.



Quad will supply power to 4 cameras and output to standard TV or VCR using the RCA outputs on back and can be used without the AgCam system.

AgCam Single Camera Video Server

Kit Includes:



- 1) 1500mA A/C adaptor
 - 2) I/O and RS485 port adaptors
 - 3) Single Channel Video Server
 - 4) Video Server Installation Assistant CD (not pictured)
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The DM Video Server allows users to view their AgCam directly on the internet without the use of any third party internet services. Just log on, and the video server will provide an easy to use graphical interface that operates like a standard web site.

Features include:

- JPEG video compression
- Remote Control via Explorer
- Motion Detect
- PTZ camera control
- Support static and dynamic IP address
- Surveillance Software (Master Vision)
- On-line firmware upgrade



Requirements:

- Microsoft Internet Explorer
- VGA Monitor(min. resolution 800x600)
- VCA card(min. resolution 800x600)
- Pentium III 800MHz or above
- Memory 128MB or above
- Windows ME, 2000 or XP
- Router