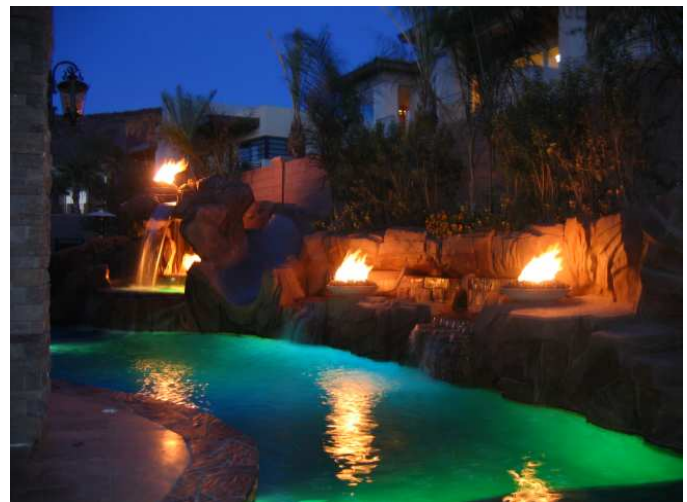




Remote Control Fire 101

**A Basic Explanation of How to Design
and Install Remote Control Fire Features**



Written by Bob Roman

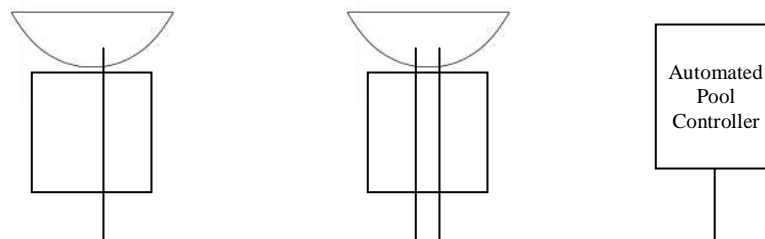
We have had many requests from our clients for a ‘basic’ course on Remote Control Fire to gain a better understanding of how it all comes together. The information below should prove helpful but in addition, if you go to the following link on our website you will find CAD drawings in PDF format that will help you even more: http://www.firebydesign.com/instructional_tools.htm

Four components needed for each fire feature:

1. Gas – either natural gas or propane. Our system comes from our supplier ready for natural gas ready and we convert it to propane prior to shipping. You will see a small yellow sticker on the outside of the RC Module indicating it has been converted for use with propane if that is how you ordered it.
2. Manual Gas Shutoff Valve upstream of our Remote Control Fire Module – depending on the building department in your area, they may require the manual gas shutoff valve to be located in close proximity to the fire feature OR just somewhere upstream of the fire feature. The plumbing codes require a manual shutoff valve any time electronic ignition is used because of the fact that electronic controlled gas valves CAN stick open. If this occurs the only way to shut the flow of gas off is by way of the manual gas shutoff valve. We have never had one of our gas valves stick open but the possibility still exists. Another good reason to have a manual gas shutoff valve is give the customer a way to adjust the size of the flame in the feature.
3. Low Voltage Electricity – 24 volt power (We supply 24 volt transformers with our kits – your electrician just needs to run the wire (Min. 14 gauge wire) from the fire feature to the Automated Pool Control Panel where the transformer will be installed).
4. Drain Hole – this is imperative. We have had customers ruin our Remote Control Modules because the bowl or whatever type fire feature they installed it in did not have adequate drainage and it subsequently filled up with water during a heavy rain.

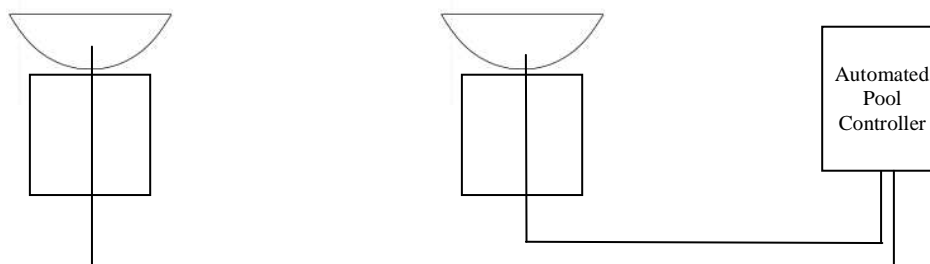
Ways to Install Electrical Conduit from the Automated Pool Control Panel to the fire features:

1. Daisy Chain: one conduit run, one pair of wires for EACH feature.



Note: In the picture at left, there is only one conduit but there are 2 pairs of wires. One pair of wires goes to the first bowl, the second pair of wires continues onto the second bowl.

2. Direct Run: Obviously more costly to do it this way



Types of Fire Features

Bowls

Precast concrete, precast GFRC, round copper, square copper, faux rock bowls

What is GFRC? Glass Fiber Reinforced Concrete is a concrete/fiberglass mix that retains most of the original strength of concrete while reducing the weight by as much as 50%.

Considerations when using Precast Concrete or GFRC bowls for fire features:

Precast concrete and GFRC can crack when exposed to heat. We have never had any of our bowls crack but the reason for that is we allow for adequate space between the edge of our fire ring and the edge of the bowl plus we never put the ring down inside the bowl either.

1. We plan on having approximately 6” of space between our ring and the edge of the bowl – if we are using a 30” bowl the largest fire ring we will use is an 18” ring.
2. We don’t put the ring down inside the bowl – we will use a long enough pipe nipple in the top of our Remote Control Fire Module so that the bottom of the fire ring is NO LOWER than the top edge of the bowl.

By installing your fire rings this way you will ensure your bowls are not absorbing too much heat from the flame coming off the fire ring to cause them to crack.

Faux Rock Bowls:

If you are building a rather large faux rock feature for your customer and want to add fire to the feature the most natural looking way we have seen this done is to create small ‘pockets’ in the faux rock structure from which the fire will come out later. The minimum size ‘pocket’ you want to create in the rock structure if you want to have Remote Control Fire is one that measure no smaller than 10” in diameter and 10” deep. In essence you are creating your own ‘bowls’ inside the rock.



Fire Troughs

A fire trough is either a straight or slightly curved channel that is much longer than it is wide. These work well when on a raised bond beam next to the pool. We have seen many fire troughs level with the height of the deck – not on a raised bond beam – this is something we do not recommend doing. Drainage is a problem when the fire trough extends below the deck. On a raised bond beam with a drain hole at the bottom, drainage is never a problem.



Wall of Fire

Our first wall of fire was installed on the back side of a faux rock structure measuring approximately 40' long. Our finished wall of fire measured 30' long. We are currently working on a project that involves installing a wall of fire on the back side of a 24' long vanishing edge. The water flowing off the vanishing edge will be flowing TOWARD the fire.

The key to creating a typical wall of fire is that the area where the plumbing is going to be installed has to be an area not easily viewed from the yard. All the burner bars for a wall of fire are attached 'external' to the pool structure and therefore not very aesthetically appealing. As long as the area where the plumbing and Remote Control Modules are being installed is somewhat 'hidden' from view, then the whole installation process is actually fairly simple. If you have a job where you want to create a wall of fire contact us so that we may be able to draw up the plans to show you the best and most efficient way to create this feature for your customer.



Automated Tiki Torches

Available in Copper or Black Steel Cone Heads, our Automated Tiki Torches are the easiest to install of any on the market today. Since all of the automation components are housed neatly inside the head of the tiki there are no unsightly 'boxes' needed at the base of the torches. Using 24 volt AC power currently soon to be available in a 12 volt AC version. Compatible with both Natural and Propane gas.



Acceptable Topping Material for Remote Control Fire Features

One of the more popular questions we get from our clients is:

“What should I put on top of the fire ring once everything has been installed?”

There are two things you DON'T want to put on top of your fire ring and one thing we prefer you not put on top unless you take special precautions.

What NOT to use as topping material:

1. **DO NOT USE** any sort of stone or rock **OTHER** than lava rock. The problem with most stones is the fact they have tiny air pockets trapped inside of them. When the air inside these ‘pockets’ is heated, the air expands and sometimes this causes the rock to explode. The rock in essence has become a sort of hand grenade – and can be just as dangerous as one. So **NEVER** use a rock or stone other than lava rock – lava rock does not have these same characteristics and so is perfectly safe to use in the fire.
2. When using our Remote Control Fire Module – **DO NOT USE SAND** as the material that covers your fire ring. A very important part to our system is the Flame Sensor which is located on the Pilot Burner Assembly. When you install our system correctly, the Pilot Burner is located right next to a small hole in the side of the fire ring. The purpose of the small hole in the side of the fire ring is to have a dedicated flame from the ring keep the Flame Sensor hot. If the Flame Sensor does not stay hot, the electronic ‘brain’ thinks the fire has been blown out and then the ‘brain’ shuts the fire off and attempts to restart it. When Sand is used as the topping material, it smothers the Flame Sensor such that it never gets hot and therefore the fire feature never stays lit.

What we prefer you NOT use unless you take special precautions:

1. Fireglass – much like the Sand mentioned above, fireglass when used as a topping material tends to try and smother the flame needed to keep the Flame Sensor hot. The typical indication that this is happening is when the fire is cycling on and off repeatedly. There are two ways we found to prevent the ‘Cycling’ from occurring. The easiest method is to position the Pilot Burner Assembly so it sticks out above the glass slightly. The other method is shown in the photo at right which shows the Pilot Burner Assembly with a ‘fence’ around it. We created this fence using a galvanized steel screen material we buy in the roofing section in Home Depot. Make sure that when you install the fireglass that none of it falls inside the ‘fence’ you have created around the Pilot Burner. In the end, you should still be able to see the Pilot Burner as shown in this photo.



Frequently Asked Questions

(All of these questions are posted on our website)

What makes your Remote Control Fire System better than the rest?

Igniter – the igniter is the weak link in most other Remote Fire Systems. Direct Spark Igniters, like the kind you find on most kitchen stoves – the ones that go “Tick, tick, tick” before they light – are found on most other systems. Direct Spark Igniters don’t work well outside because any residue from dirt or moisture that collects on the electrodes weakens the spark. A weak spark equates to no ignition. We use a Hot Surface Igniter – very much like a glow plug. This is the same type igniter that is used in Pool/Spa Gas Heaters. It is not susceptible to anything found outside. For this reason, you will get years of worry free dependability without having to clean any electrodes at any time like you do on a Direct Spark Ignition System. Our igniter is a Silicon Nitride igniter. Unlike the Silicon Carbide igniters which are easily cracked or broken by the slightest bump, our igniter is very durable and can take the stresses of the outdoor environment.

Small Size – the small size of our Remote Fire System makes it easy to install almost anywhere. Measuring a mere 5 ¾’ x 4 ½” x 3 ¾” enables you to install in the shallowest of bowls or the narrowest of troughs (for straight burner bar applications)

Simple Installation – Just one gas line connection and two low voltage wire connections and our Remote System is ready to go! Our system does not require a myriad of wires to make it work!

Waterproof – our valve/electronic assembly is housed in a heavy gauge aluminum enclosure that is waterproof. Thought not meant to be submerged – it will stand up to heavy rains, splashing and high humidity climates.

Is your Remote Control Fire Module UL Approved?

We are actually in the process of obtaining the UL Gas Fired Mark that will be acceptable in both the US and Canada. We submitted our application in November 2007. The process should take no longer than 2 months according to Underwriters Laboratory.

Is your Remote Control Fire Module Certified?

Yes. Our Remote Control Fire Module has the following Certifications:

IAS Design Certified by the American Gas Association. C2030017
ANS Z21.20, Automatic Ignition Systems
ANS Z21.35CAN1-6.8, Gas Filters
ANS Z21.78 / CSA 6.20, Combination Controls for Gas Appliances
CAN/CSA C22.2 No. 199, Combustion Safety Controls

Can I power your RC Module through an Automated Pool Controller such as an Aqualink?

Yes. Most of our installations have involved an Aqualink or similar system. The key is to bring your 110v off of one of the relays (Load terminal) to power the 24v transformer that comes in our kit. If there are only two fire features to power and they are both being turned on by one button on the handheld remote, there is usually enough room inside the Aqualink enclosure to locate the transformer there (the transformers are small in size). If you need more than one transformer, you may need to put a J-box next to the Aqualink and run your 110v line through conduit over to it to power the transformers inside the J-box.

If I don't have an Aqualink or some similar system – how do I control your RC Module?

Another way to control our system is through 'other' electronic remote systems such as X-10. We offer the X-10 components through our website but really you can get X-10 anywhere, including Home Depot.

Are you developing new products for outdoor use?

Yes. We are constantly coming up with ideas to help add decorative fire features for use outdoors. We are currently developing Remote Control Fire Tiki Torches which we anticipate to introduce in the Fall of 2007.

Do you have an RC Module for use in Fire/Water Bowls?

In November of 2007 we are introducing our "Fire/Water Spillway Kit" which will make it possible to have fire and water in the same bowl. The type of bowl we are referring to here is the type with a spillway where the water flows out of the bowl and into a pool, pond or another bowl.

Can you use one RC Fire Module to power two separate Fire Features?

No, not normally unless the fire rings or burner bars are touching each other. If you have a rectangular firepit requiring more than one fire ring (by the way we do offer round, square and rectangular fire rings) you can control the fire rings using just one RC Module. If you go to the link on our website, "Instructional Tools" and click on the PDF document "RC Module Plumbing when more than One Fire Ring", you will see how to do this. The key to this working is to make sure the fire rings are either touching each other or at least very close to one another so that the flame will 'jump' from one ring to the other when lit.

Can you use one 24v Transformer to power more than one RC Module?

Yes. You can 'Daisy Chain' two fire features but no more than that. With our original igniter you could Daisy Chain up to 3 fire features but with the upgraded igniter we introduced in the fall of 2007, the electrical power needed for the new igniter is considerably more than the original igniter. For this reason, we can now only power two features through the same set of wires.

Do I need to install a Manual Shutoff for the gas if using your system?

Yes. National Code requires that a Manual Shutoff for the gas be installed when using Electronic Ignition. The location of the Manual Shutoff varies depending on what your Building Department requires. There are two good reasons to install a Manual Shutoff. First, it does not happen often but it is possible the valve inside our Remote Control Module could stick "open" after being lit. In the event this occurs, the only way to shut the flow of gas off is through the Manual Shutoff. Second, the Manual Shutoff is the best way to adjust the flame height of the fire feature. By turning the Manual Shutoff toward "off", you consequently lower the flame.

Will your system work in windy conditions?

Yes. Through our own experience installing and working with our system we have found that if installed in accordance with our installation manual – your fire features will not only light but

also STAY lit in very windy conditions. Where we are located in Nevada, we tested our system in 60 mph winds and even though the flame was dancing quite a bit – the unit not only lit, it stayed lit.

What happens if the flame IS blown out?

Our system is a Continuous Relight system. If the flame is blown out, the RC Module will attempt to relight itself. If the flame is blown out 4 times, the system will shut itself down. At this point, the power to the RC Module needs to be cycled off and then back on to start the ignition sequence over as described at the beginning of this paragraph.

Can you control your system through a spa side switch?

Yes – but only if the spa side switch is connected to an Aqualink or some other Automated Pool Controller. We have done installs where fire features next to the spa are controlled by BOTH the handheld Remote Control that comes with the Automated Pool Controller AND the spa side switches. The control of the fire feature is exactly like a 3 way light switch in a house. You can turn the fire on by the spa from inside the house and then you can turn it off via the spa side switch once you are in the spa. The key is in the programming of the Remote Control that comes with the Automated Pool Controller.

Do you offer custom-made burner bars?

Yes. We offer custom made burner bars in black steel, galvanized steel and stainless steel. If you fax or email us a rough sketch with dimensions we will email you a quote with prices for all 3 materials mentioned above.

Do you offer Free Shipping?

For purchases of \$100 or more – Ground UPS shipping is free. If you would like expedited shipping you only pay for the difference in cost between the expedited shipping and the ground shipping rate to your location.

What forms of payment do you accept?

We accept Visa and MasterCard credit cards, Money Orders and Checks. In the event you are paying by check, once the check has cleared through our bank, we will ship your order.

Do I need to put a drain hole in the bowls I install your system in?

YES! Even though our RC Module is housed in a waterproof enclosure it is not meant to either 'sit' or be 'submerged' in water. You only need to drill a hole ¼" or larger in size in either the bottom of your bowl or trough – but at least one drain hole should be made anywhere our RC Module is installed.

How long does it take for your system to light once the button is pushed?

The delay between pushing the button and when the fire lights is usually no more than 10 seconds. Typically it only takes about 5 seconds.

Which fire rings do you recommend for outdoor use?

We always recommend using Stainless Steel Fire Rings for outdoor use. The Black Steel rings will rust rather quickly and the first place on those rings that rust forms is in the outlet holes of the ring. Over time the rust on the outlet holes builds up to the point it actually restricts the flow of the gas through them and will decrease the size of the flame. For the added cost of the Stainless Steel rings you avoid having to replace your Black Steel ring every year or two (depends on the humidity in your area how long the Black Steel ring will last).

Does your system work with propane?

Yes. We can convert your RC Module for use with propane prior to shipping it to you. You just need to indicate it is for propane at the time you place your order. Every Module we convert for propane use has a label on it indicating it has been converted for use with propane.

Do you have Resources available to help with the install of your system?

Yes. If you log onto our “Contractors Only” part of the website you will see a link in the Header Bar for “Instructional Tools”. At the moment we only have PDF files available for download. In the near future we will be adding instructional videos for download as well.

How many BTU’s does your RC Module supply?

Our normal RC Module will supply 204,000 BTU/hr, which is more than enough for rings up to 30” in diameter. If you need more BTUs, we can build an RC Module for you that will supply 475,000 BTU/hr. The physical size of the enclosure for the larger gas output is identical to the physical size of the enclosure for our normal RC Module – the only difference you will notice is the inlet and outlet size is ¾” versus the ½” openings for the normal RC Module. This is a special order item with an add-on charge to the RC Module kit of \$100 and takes 2 weeks to deliver

Do you offer an RC Module that supplies more than 200k BTU/hr?

Yes. We offer an RC Module with an output of 475,000 BTU/hr. The size of the enclosure for this high capacity module is identical to the size of our normal RC Module – the only difference you will notice is the inlet and outlet size is ¾” versus the ½” openings for the normal RC Module. This is a special order item with an add-on charge to the RC Module kit of \$100 and takes 2 weeks to deliver

How do I control one Fire Feature with one button and another Fire Feature with a different button?

In order to control fire features in this way you will need to use more than one relay from inside the Automated Pool Controller such as an Aqualink.

Troubleshooting

I installed your system, turned it on and nothing happened

A majority of the time, when this occurs it is due to incorrect wiring or the absence of electrical power (GFI breaker needs to be reset possibly). Every 24v Transformer and RC Module we ship is bench tested just before it is placed in a box for shipping so though it is possible, it is very unlikely those two electrical components are faulty. Look closely at the pilot igniter to ensure the center 'glow plug' piece is intact (see page 2 of the Install Instructions to figure out which piece is the 'glow plug'). If the glow plug is intact and is not glowing red hot immediately after power is applied, use a multimeter on the wires leading to the Remote Control Module to ensure you have at least 24v AC power at the Module. If no power, check all electrical connections between the Remote Control Module and your electrical power source. If there is power, call our toll free number to request a new unit.

The glow plug on the igniter is turning orange but the pilot is not lighting

If a new gas line was installed to power your fire feature it is VERY important you purge the gas line PRIOR to installing the Remote Control Module. If you forgot to purge the gas line it could take up to 30 attempts to light the fire feature using the Remote Control Module in order to purge the air from the gas line before it finally lights. If the gas line has been purged and it still won't light, call our toll free number to request a new unit.

The fire feature is turning on just fine but it's only staying lit for a short time.

The most sensitive part to our RC Module is the flame sensor rod. If the flame sensor rod is not engulfed in flame while the fire feature is on, it will cause the Module to shut down and then relight. Refer to the diagram on Page 2 of the Installation Instructions for proper 'positioning' of the flame sensor in relation to the fire ring. Also, the placement of Lava Rock or Fireglass on top of the Pilot burner will affect the flame sensor as well. Ensure that there is adequate air space around the Pilot burner to allow the flame to burn freely in this area. Never completely cover the Pilot Burner with either Lava Rock or Fireglass.

What is the best way to purge air from a new gas line?

The best way to purge the air from a gas line is to turn the manual gas valve on at the fire feature and let it flow until you smell gas. Then you can install the RC Module. By purging the gas line you will only have to wait about 10 seconds after you initiate ignition to have the fire turn on.

How long does it take to purge the air from a new gas line?

If you purge the gas line as directed in the previous paragraph it should take less than a minute to purge it. If you forget to purge it as described above and try to purge it by turning the RC Module on and off repeatedly it could take up to 30 attempts before it finally lights. The time it takes to purge a gas line is heavily dependent upon the length and size of the gas line.