X8Pro Remote Control

REVISED FOR SERIAL #1050 AND ABOVE

TABLE OF CONTENTS

Copyright Notice

Disclaimer

WARNING

THE MANUFACTURER OF THE X8PRO REMOTE CONTROL MAKES NO WARRANTIES FOR THE INTENDED USE OF THIS PRODUCT.

THIS DEVICE IN NOT INTENDED AND MUST NOT BE USED IN ANY APPLICATION THAT INVOLVES MOVING A PERSON OR PERSONS, SUCH AS A BOOM TRUCK OR MAN-LIFT. THIS IS RADIO DEVICE AND SUBJECT TO INTERFERENCE FROM OUTSIDE SOURCES THAT COULD CAUSE A MALFUNCTION AND SEVERE INJURY OR DEATH.

THIS DEVICE MUST BE PROVIDED WITH AN EMERGENCY STOP SWITCH TO INTERRUPT POWER IN CASE OF AN EMERGENCY.

THE USER/INSTALLER MUST DETERMINE AND PROVIDE FOR POWER SAFETY INTERLOCKS TO INTERRUPT POWER ANY TIME THE SYSTEM IS NOT IN OPERATION OR ANY TIME A HAZARD COULD EXIST.

X8Pro Revisions to Serial #1050 and Above

The receiver setup instructions above are valid for serial numbers 1050 and above, however several new features have been added.

Pairing with Transmitters

* A three-pin jumper block has been added to enable definitive control of when a new remote transmitter is allowed to be paired with a receiver.
* The jumper setting controls whether the X8Pro will always allow pairing with a new remote, or will always ignore new remotes, or will clear all previously paired remotes.
* Refer to the Receiver Setup section for more information.

LEDs

* LEDs for power and receiver status
* LEDs for each output and the unloader status
* Refer to the Troubleshooting section for more information

New Outputs

* The LATCHED function has been replaced with the LATCHED TOGGLE SOFT START function.
* The BUMP TIME is a new parameter for the proportional ramped output types.
* Refer to the Function and Proportional Control section for more information.

X8Pro Remote Control - Introduction

Overview

- Radio remote control feature 8 programmable, proportional functions
- Operates on 418 MHz ISM Band (Industrial, Scientific, Medical)
- 300 feet line-of-sight range
- Multiple functions can operate at the same time
- Easy installation
- Operator friendly
- Ideal for ON/OFF or motion control in hydraulic or electromechanical applications

Transmitter

- Industrial strength cast aluminum housing, sealed keypad, and unbreakable antenna.
- High capacity rechargeable battery allows for days of heavy use before recharging.
- Custom keyboard overlays are available even for small quantities.

Receiver

- 12 volt operation.
- All 8 "Function" outputs and an additional "Unloader" output use solid state drivers capable of driving 4 Amp loads and are both overload and short-circuit protected..
- The "Unloader" output can be used to proportionally control on/off (Bang-Bang) solenoid hydraulic circuits.
- Outputs are overload and short circuit protected.
- Circuitry is totally encapsulated in epoxy for protection from the elements.
- Can operate in wet, dirty, and high vibration environments.
- Optional output for forward/reverse control of a DC motor.

Proportional Control

The X8PRO uses a unique method of proportional control. Any function including the unloader can be programmed to be proportional. When a function is selected the output starts outputting a Pulse-Width-Modulated (PWM) signal at a preset (or programmed) minimum and then Ramps up at a programmed rate to a preset maximum.

Each "Ramped" function has a user programmed set of values that determine what the function does:

SPEED MIN
Minimum Ramp Speed (0-100% PWM) when the function is first turned on. Note that proportional solenoids are highly non-linear and most will require at least 25% PWM to start to open (crack).

SPEED MAX
Maximum Ramp Speed (0-100% PWM) when Ramping is finished. Note that due to the non-linearity it is likely the solenoid will be fully open before 100% PWM is applied.

RAMP TIME
Time in seconds (1-16) for Ramping to go from 0 to 100% PWM. Note that a MIN above 0% or a MAX below 100% will decrease the set Ramp Time proportionally.

Example for Ramp Time
Ramp Time set for 10 seconds
MIN set for 25%
MAX set for 75%
Actual Ramp Time from 25% to 75% will be 5 seconds since 25% to 75% is 50% of the total speed range (0 to 100%).

(continued)

RAMP DELAY

Time in seconds (0.0-5.0) before Ramping starts, after the function has been selected. The function will start at the MIN setting and remain at that speed until the Ramp delay expires, at which point Ramping will start. This may be used to take up mechanical slack in a system before any speed increase occurs. An example would be a system that uses chains, sprockets, and loose links or couplings that will be reversing in operation.

BUMP TIME

This is the time in milliseconds that the function will be fully on before a proportional output starts ramping from its minimum setting. This can be used to overcome the "stiction" of a cylinder's piston/rod in the stopped position by bumping it a bit to get it started moving for lower minimum settings.

All functions are programmable from a pc using a free utility, refer to "Section 2: X8PRO Configuration Utility".

X8Pro Remote Control - Functions

Any of the 8 buttons on the remote may be programmed as:

- **ESTOP**
- **MOMENTARY**
- **MOMENTARY - UNLOADER FULL ON**
- **MOMENTARY - UNLOADER RAMPED**
- **MOMENTARY - FUNCTION RAMPED**
- **LATCHED** *(removed as of Serial #1050)*
- **LATCHED TOGGLE SOFT START/STOP** *(valid in Serial #1050+)*
- **LATCHED TOGGLE**
- **LATCHED TOGGLE - UNLOADER FULL ON** *(added Sept 2015)*
- **LATCHED TOGGLE - UNLOADER RAMPED (START MIN)**
- **LATCHED TOGGLE - UNLOADER RAMPED (START LAST)**
- **LATCHED TOGGLE - FUNCTION RAMPED (START MIN)**
- **LATCHED TOGGLE - FUNCTION RAMPED (START LAST)**

ESTOP
Emergency stop. This function will turn off all latched outputs. Note that this is not a "true" Emergency Stop. Only killing power to the receiver and solenoids can insure no activation of any function.
NOTE: A main power switch MUST be installed in the system to interrupt the power to the receiver and solenoids. The ground connection to the receiver should NEVER be broken.

MOMENTARY
The function output is fully on while the function button is pressed and held. It turns off when the function button is released.

MOMENTARY - UNLOADER FULL ON
The function output is fully on and the unloader is fully on when the function button is pressed and held. Both turn off when the button is released.

MOMENTARY - UNLOADER RAMPED
The function output is fully on and the unloader output is Ramped up while the function button is pressed and held. Both turn off when the function button is released.

(continued)

MOMENTARY FUNCTION RAMPED
The function output and the unloader output are Ramped up while the function button is pressed and held. Both turn off when the function button is released.
NOTE: When a second MOMENTARY function is selected, whether programmed to Ramp or not, it will Ramp at the same rate as the first function selected.

LATCHED *(removed as of Serial #1050)*
The function output is fully on after a momentary press of the function button. The output will remain on until an ESTOP function button is pressed.

LATCHED TOGGLE SOFT START/STOP *(valid in Serial #1050+)*
This function replaces LATCHED (above) at serial number 1050 and above. The function ramps the output to fully on in 3 seconds after a momentary press of the function button. The function will remain on until the same function is pressed again, at which time it will ramp down to fully off in 3 seconds. This may be used to relieve start/stop shock.

  (continued)

LATCHED TOGGLE
The function output is fully on after a momentary press of the function button. The function will remain on until the same function button or an ESTOP function button is pressed.

LATCHED TOGGLE UNLOADER FULL ON
The function output is fully on and the unloader output is fully on after a momentary press of the function button. The function and unloader will remain on until the function button is pressed again or an ESTOP function is pressed.

IMPORTANT NOTE: More than one button may be programmed for Latched Toggle Unloader Full On. Momentary, Momentary Unloader Full On, and Latched Toggle may be used with the Latched Toggle Unloader Full On Function active. No Ramped functions are allowed and should not be programmed.

This function was added as of X8Pro version 10 in September 2015. If your X8 was manufactured prior to this date it does not support the Latched Toggle Unloader Full On function.

LATCHED TOGGLE – UNLOADER RAMPED (START MIN)
The function output is fully on after a momentary press of the function button. The function will remain on until the same function button is pressed again, or an ESTOP function button is pressed, or another LATCHED TOGGLE function button is pressed. Once latched the #7 function will Ramp the unloader UP and the #8 function will Ramp the unloader DOWN. The Ramping starts at the MIN set in the X8PRO Utility.

LATCHED TOGGLE – UNLOADER RAMPED (START LAST)
The function output is on after a momentary press of the function button. The function will remain on until the same function button is pressed again, or an ESTOP function button is pressed, or another LATCHED TOGGLE function button is pressed. Once latched the #7 function will Ramp the unloader UP and the #8 function will Ramp the unloader DOWN. The Ramping starts at the LAST speed set when the function was last toggled off.
NOTE: Turning off a TOGGLE RAMP FUNCTION with an ESTOP will NOT save the last speed setting.

(continued)

LATCHED TOGGLE - FUNCTION RAMPED (START MIN)
The function is immediately Ramped to the MIN set in the X8PRO Utility after a momentary press of the function button. The function will remain ON until the same function button is pressed again, or an ESTOP function button is pressed, or another LATCHED TOGGLE function button is pressed. Once latched the #7 function will Ramp the toggle function UP and the #8 function will Ramp the toggle function DOWN. The unloader output will Ramp along with and the same as the function.

LATCHED TOGGLE - FUNCTION RAMPED (START LAST)
The function is immediately Ramped to the LAST speed set when the function was toggled off . The function will remain ON until the same function button is pressed again, or an ESTOP function button is pressed, or another LATCHED TOGGLE function button is pressed. Once latched the #7 function will Ramp the toggle function UP and the #8 function will Ramp the toggle function DOWN. The unloader output will Ramp along with and the same as the function.

NOTES ON USING TOGGLE RAMP FUNCTIONS
1. Any function other than 7 or 8 can be used for a TOGGLE RAMP function. Only one TOGGLE RAMP function can be on at one time. Selecting another toggle Ramp function while one is on will result in turning the first one off. The button must then be released and pressed again to turn on that function.
2. When a TOGGLE RAMP function is on, functions 7 and 8 are dedicated to Ramping UP and DOWN respectively. However they can be programmed with the file utility to be used for any other function when a TOGGLE RAMPED function is not on.
3. While a TOGGLE RAMP function is on, MOMENTARY, LATCHED, and LATCHED TOGGLE functions can be turned on and off with normal operation. If a MOMENTARY RAMPED or MOMENTARY FULL ON function is selected, the function will act as if it was programmed for MOMENTARY only and will simply turn on the function with no Ramping or effect on the unloader.

DC Motor Control

The X8PRO receiver must be ordered with this optional output control. When installed, functions 7 and 8 need to be configured for MOMENTARY. When function 7 button is pressed the two wire control output will be 12 volts plus-to-minus and the opposite

when the function 8 button is pressed. An example application
would be a DC motorized throttle control on an engine.

X8Pro Remote Control - Hardware

Figure 1. X8Pro Receiver

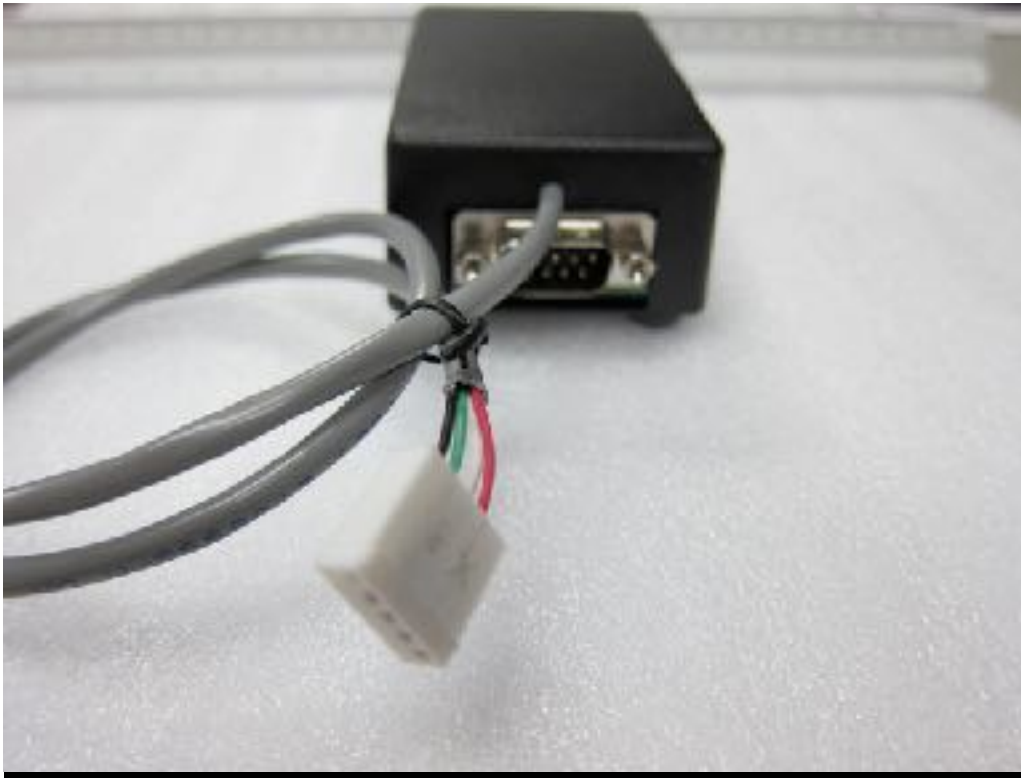**Figure 2.** **Version 3 Programmer (USB Converter) - Front**

Figure 3. **Version 3 Programmer (USB Converter) - Side**

Figure 4.   X8Pro 8-Button Industrial Transmitter - Top

X8Pro Remote Control – Installation and Wiring

Receiver Mounting

The X8PRO remote control is a Radio Frequency device. Radio communication is a well understood technology and one of the understandings is that many factors, some that can be controlled and some not, will affect the performance of the radio link. For example, the X8PRO can have reliable reception in excess of 300 feet if the transmitter and receiver are outdoors, the transmitter and receiver antennas are in line of sight, the air is dry and there are no other nearby radio transmissions. Any variation from these ideal conditions and the transmission range will decrease. *The most important of these conditions is line of sight of the antennas and fortunately it one thing we can control or at least try to optimize.*

The transmitter by necessity is mobile and is usually not the critical factor in the radio link. The operator should try to hold the transmitter so it is "looking" in the vicinity of the receiver and not transmitting through the operator's body.

The receiver's antenna location is very critical. The current version of the X8PRO receiver has a threaded antenna connector and comes standard with a one piece whip antenna. Optionally it can be supplied with a cabled magnetic mount antenna. If the whip antenna is used the receiver must be mounted for the most advantageous antenna position. If the Mag-mount antenna is used the receiver can be mounted anywhere convenient within the length of the antenna cable.

The ideal antenna position is on the top of the vehicle with no obstructions in any direction and in line of sight with the transmitter wherever it might be located. Obviously this is not always possible. Next best is to mount the receiver and antenna (or just antenna) as high as possible. The antenna should not be any closer than 12 inches from a metal object, and again should have the best possible "view" of the transmitter. Radio waves do not penetrate metal but it has been shown that satisfactory results can be had, even if the antennas cannot see each other, as long as the distance is not too great as is usually the case. After installation, test the performance with the operator in different positions including the most disadvantageous and

farthest distance. Note that the surroundings can have an effect. Examples being metal buildings and chain link fences.

Receiver Wiring

- The X8PRO requires a dedicated 12 volt circuit that is switched and fused no greater than 10 Amps.
- The switch should be located such that it can be used for an emergency shutdown in the event of a failure or out of control function. Do not feed the system power from any other sources such as lights or ABS brake circuits.
- A dedicated ground circuit is also required - ***do not rely on chassis ground.***
- It must be understood that this is a radio device and is subject to interference which could cause erratic behavior. Be aware of this and install as many safeguards as necessary. Automate as much as possible as to when the system can be powered. Since the applications for the X8PRO are so vast the installer/user must decide on the best approach for insured safety.

Solenoid Wiring

Solenoid hookup is straight forward. One terminal of each solenoid is grounded and the other terminal is connected to one or more of the color coded function wires listed below.

Two or more solenoids may be connected to one function as long as the total current draw does not exceed 4 Amps.

Two or more functions can be connected to a single solenoid. For example, Function 1 and 2 are connected to a single proportional coil. Function 1 is programmed as Momentary and Function 2 is programmed as Momentary Ramped. When Function 1 is selected the solenoid will fully turn on. When Function 2 is selected the solenoid with Ramp.

Function Wires

```
+12 VOLTS    RED
GROUND       BLACK
FUNCTION 1   WHITE
FUNCTION 2   GREEN
FUNCTION 3   BROWN
FUNCTION 4   BLUE
FUNCTION 5   WHITE/BLACK STRIPE
FUNCTION 6   GREY
FUNCTION 7   ORANGE
```

```
FUNCTION 8  PURPLE
UNLOADER    YELLOW
```

Transmitter Charging Overview

The transmitter comes with a charging cable with a cigarette lighter plug. Optionally a 12 volt wall adapter is available. Once connected a RED LED will light and later turn off when the transmitter is fully charged, usually in less than 2 hours. Even with heavy use the charge should last several days. The batteries are not user replaceable but should last many years. If replacement is necessary the transmitter can be returned to the factory and the batteries replaced for a nominal fee.

Note: Small plastic transmitters that will work with the X8PRO receiver are available on-line and from other sources. Although they will work they are not recommended for other than a backup. They will not hold up in an industrial environment at are apt to fail and possibly cause unwanted operation of the receiver causing a hazard.

Transmitter Charging Notes

Please keep a copy of the pages regarding Charging handy for troubleshooting.

The Midcom X8 Industrial transmitter is equipped with a "smart" battery charging circuit. The charging circuit expects to see a power source of 9 volts to 15 volts D.C., capable of providing at least 200 milliamps, more is okay. This is available either from an automobile cigarette lighter jack/12 volt D.C. power jack charging cable available from Mid:Com or from an optional 9 to 15 volt D.C. wall adapter, also available from Mid:Com. The smart battery charging circuit controls the charging voltage and current to the battery pack per the battery pack manufacturers' instructions. The charging circuit, provided with a proper voltage and current source, should charge a drained down battery pack in no more than 2 hours and 45 minutes. If the battery pack is not completely discharged, the charging should take much less time, often well under 2 hours.

(continued)

Nominal Transmitter Charging Sequence

1. When the charging plug is plugged into the charging jack on the Midcom X8 Industrial transmitter, after about one second, the LED next to the charging jack should light up. The LED is most likely green in color when lit, but it may also be red, yellow or blue on some transmitters.

2. When the LED is constantly lit up and not blinking or flashing, the battery pack is being fast charged. This is normal and good.

3. When the smart charging circuit has determined that the battery pack is fully charged, it will turn off the LED and stop charging the battery pack. At this point the charging plug can be unplugged and the transmitter can be put back into use. Note that if the battery pack is still nearly fully charged when the charging plug is plugged in, the LED could light up and then turn off as soon as 5 minutes after plugging in the charger.

Abnormal Transmitter Charging Sequence

1. When the charging plug is plugged into the jack on the Midcom X8 Industrial transmitter, after about one second, the LED next to the charging jack starts blinking or flashing. This indicates that the smart battery charging circuit has detected an error or fault condition. Most likely, in the winter time, this means the battery pack is too cold and the battery pack cannot be charged when it is too cold. If the user is trying to charge the transmitter in a cold area, it may never charge and it must be moved to a heated area in order to charge.

2. After the transmitter has been moved to a heated area, it will take some time for the battery pack to come up to a proper temperature. If the charging plug is plugged in, the LED will flash while the battery pack is too cold and then it will light solidly, without blinking, once the battery pack has warmed up sufficiently.

3. If after several hours in a warm environment, the LED is still flashing, then most likely there is some other problem with the transmitter circuit board or the battery pack, and the transmitter will need to be returned to the factory for evaluation or it will need to be replaced.

Transmitter Charging Warning

If you plug the charger plug into the MidCom X8 Industrial transmitter and after about one second the LED has not lit up nor started flashing, there is most likely a problem with your charger cable fuse, cigarette lighter fuse, 12 volt DC power jack fuse, vehicle wiring circuit, or your wall charger.

If you are using the Midcom automobile cigarette lighter/12 volt DC power jack cable for charging, there is a fuse inside it that may be blown.

Unscrew the tip end which plugs into the cigarette jack and check the fuse. If the fuse is blown, replace it.

If it is good, check the vehicle fuse which feeds the cigarette lighter or 12 volt DC power jack to see if it is blown. If it is blown replace it.

If it is good, plug some other device into the cigarette lighter or 12 volt power jack, preferably one with a LED indicator on it, like a cell phone charger, to see if the jack is good and providing power or not. If it is not, you must troubleshoot the vehicle wiring to determine the problem.

If a fuse is blown you must also determine the cause of the blown fuse and correct the cause.

(continued)

Transmitter LED Status Notes

Please keep a copy of the pages regarding LED Status handy for troubleshooting.

Transmitter LED after inserting the charging plug into the Transmitter:

LED Status	Charge Action State
On solidly	Normal charging condition. Battery pack is being fast charged. Normal, good condition!
Flashing on and off	Pre-charge qualification,
Flashing on and off	Battery is too cold,
Flashing on and off	Battery starting voltage is too low to start charging.
Off	Battery absent, wire to battery pack is broken, automobile charger fuse is blown, wall charger is not plugged into an outlet or the outlet is dead or the wall charger is dead.
Was ON and is now Off	Charge complete

If the LED flashes continuously:
1. Battery pack is too cold. Warm up the battery pack. In a very cold garage or in a very cold vehicle, the battery pack may not ever warm up enough for the charging cycle to start. The transmitter may need to be moved indoors to charge.
2. Temperature sensor wire or lead is broken or temperature sensor is bad. Return transmitter to MidCom for evaluation. Replace circuit board or entire transmitter.
3. Battery voltage too low. Battery pack is bad or extremely discharged or battery pack is shorted out or has weak cells. Return transmitter to MidCom for evaluation. Replace circuit board or entire transmitter.
4. Bad or broken IC or component or bad circuit board. Return transmitter to MidCom for evaluation. Replace circuit board or entire transmitter.

(continued)

Transmitter LED was on and shuts off:
  1. Charging is finished. This is the most likely reason.
  2. Battery temperature is too high. Not likely unless attempting to charge in a very hot environment.
  3. Battery is unplugged or has broken wire or bad connector, or battery voltage is too high. Unlikely unless battery pack is old or someone has been messing with the battery pack.
  4. Charger has died or fuse has blown. Unlikely but can be checked by unplugging charge plug from transmitter for 1 second, then plugging back into transmitter and checking for LED to light up.

X8Pro Remote Control – Remote Setup Procedure

Remote Features

The X8 remote control is very versatile and can be set up for many different tasks.

- For the transmitter and receiver to communicate they must "know" each other by a unique code stored in both units.

- The transmitter code is one of millions which is generated randomly during setup. The probability of two or more transmitters having the same code is virtually zero.

- The receiver "learns" up to 40 codes so up to 40 transmitters can work with one receiver. After the 41st code is learned the first one learned is discarded.

- The transmitter can be set up to enable some or all of its 8 functions, so one transmitter may be able to operate all functions on a receiver and another transmitter only some functions on the same receiver.

- *Note: Before proceeding with setup, first read and review the following procedure since the setup routine requires doing things within time limits.*

Transmitter Setup

***NOTE: The receiver must not be powered up during this procedure! ***

1. Remove 4 screws securing the cover.
2. Carefully set cover off on side keeping keypad hookup connected.
3. Locate 2 Learn pads near the center of the board.
4. Short the pads together with the tip of a screwdriver or similar tool until the LED light is blinking.
5. During that time, press in any order, the buttons for each function that you want to authorize for this transmitter.
6. When the 20 seconds have elapsed the LED will stop blinking.
7. The transmitter now has a new code and has stored the button authorizations.

(continued)

Receiver Setup

Depending on the Serial# of the X8Pro there may be a jumper that controls the ability of the receiver to be paired with remotes.

*** IMPORTANT NOTE FOR RECEIVERS SERIAL #1050 AND OLDER ***
In normal use every time the receiver powers up it will be in "LEARN MODE" for 20 seconds. If a transmitter that is paired to a different receiver is being used in close proximity to this receiver it may learn the code for the remote and respond to that transmitter from that point forward. To correct this the transmitter and receiver setup procedure should be performed on one unit or the other.

X8Pro Receiver Setup – Serial #1050 and OLDER

The receiver goes into "learn" mode for 20 seconds every time power is applied. To set up a receiver for a new transmitter, disconnect power and then reconnect. Within 20 seconds, press any authorized button on the transmitter for about one second and then release. The receiver has now "learned" the transmitter code and is ready for operation after the 20 seconds have elapsed. Repeat the process (disconnect/reconnect power) for each additional transmitter that needs to work with this receiver.

As an example of the versatility of the X8 consider the following practical situation:

You set up five transmitters to each work with five different receivers. They can all work in radio range of each other without interfering with each other. You now set up a sixth transmitter to work as a "master" by having all five receivers "learn" the code for the new transmitter.

- **Problem:** Two of the receivers are working close to each other. The "master" is operating both and you want it to only operate one of these two, but still operate the remaining three.
- **Solution:** Set up the "master" again so that it has a new code. Have one of the two receivers "learn" the new code. When the "master" needs to be used with the other three receivers, have these also "learn" the new code as one of the 40 codes they can hold. The old "master" code still exists in the receivers but will never be used again because of the huge number of possible codes.

(continued)
X8Pro Receiver Setup - Serial #1050 and NEWER

Figure 5.   Serial #1050+ Pairing Control Jumper
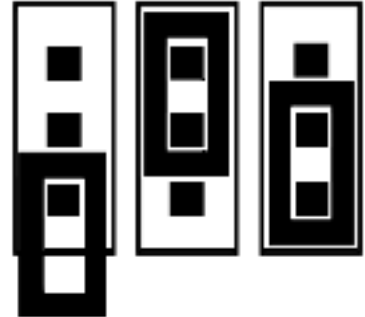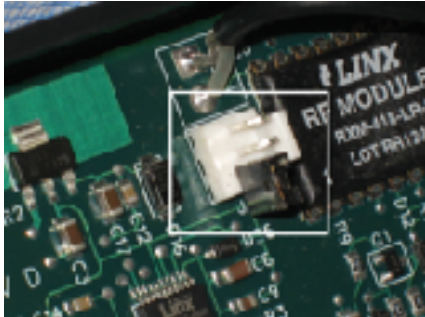
The receiver setup instructions above are valid for Serial #1050 and above, however two new features have been added.

Note the three pin jumper block in the photo above - there are three possible positions for the jumper:
- Not jumpered (or with the jumper on one pin only) is the default from the factory (as shown in the picture above),
- The bottom two pins may be jumpered or,
- The top two pins may be jumpered.

The default (**not jumpered**) allows the receiver to "learn" new codes on power-up as described in the section above for Serial #1050 and older.

If the **bottom two pins are jumpered** the receiver will not be able to learn new codes and the receiver is safe from learning a code from a nearby transmitter after power-up.

If the **top two pins are jumpered** all stored codes will be erased, the process may be started with power on or off:
  1) Place shunt onto upper two pins
  2) Power receiver on - the Green and Yellow LEDs will turn on for ~10 seconds then the Green LED will turn off
  3) Remove the shunt, the Green LED will turn on for ~2 seconds and then turn off and the yellow LED will blink
  4) Yellow LED blinking indicates that all transmitter codes have been successfully erased.
  5) Remove the jumper so the receiver can "learn" new codes.
  6) After learning the jumper may be left un-jumpered or the bottom pins may be jumpered to disable learning.

X8Pro Remote Control – Troubleshooting

Most troubleshooting can be done with the two groups of LEDs on the front panel of the receiver.

Top LED group, left to right: BLUE, GREEN, YELLOW

BLUE – Power
- If it is not lit test for power on the red and black wires with a voltmeter or test light.
- If no power on these wires the problem is upstream of the receiver.
- If the LED flickers or goes out when a function is energized there is a bad connection before the receiver.
- If power is present and the LED is off the receiver is faulty.

GREEN – Receiver Mode
- Flashing Fast for 20 seconds indicates the receiver is in "learn" mode.
- On Solid for 10 seconds indicates the receiver is erasing codes.
- If the GREEN LED does not come on in either Learn or Erase Mode the receiver is faulty.

YELLOW – Transmitter Status
- While the receiver is waiting for a signal from the transmitter the YELLOW LED will flash fast.
- When the receiver receives a signal with a correct code from the transmitter the YELLOW and GREEN turn on solid.
- If the code is incorrect (units not paired) the YELLOW LED will flash slower and the GREEN LED will be off.
- If there is no change in the YELLOW LED when a transmitter button is pressed the problem is likely in the transmitter.
    - o Check the receiver with a known good transmitter or the transmitter with a known good receiver.
    - o If the transmitter is good the receiver is faulty.

Top LED Group Summary

BLUE	YELLOW	GREEN	STATUS
SOLID			POWER ON
	SOLID	BLINK	LEARN MODE
	FAST BLINK	OFF	READY TO SEE A SIGNAL
	SLOW BLINK	OFF	SIGNAL PRESENT, REMOTE+RECEIVER <u>NOT</u> PAIRED
	SOLID	SOLID	SIGNAL PRESENT, REMOTE+RECEIVER PAIRED

(continued)

Bottom LED group, one LED is connected directly to each of the eight function wires and one to the unloader output.

It's important to note that the solid state output drivers are overload and short-circuit protected such that they will shut down, without damage, if either condition exists.

There are several reasons that will cause a one or more functions to not turn on or otherwise not operate as intended.

1. The transmitter is faulty or not charged. This would be the case if the YELLOW FUNCTION LED does not change state when a button is pressed.

2. The transmitter button was not authorized in the setup routine.

3. The transmitter has a weak signal and only works close to the receiver.

4. The receiver's antenna is faulty or disconnected in which case the functions work only when the transmitter is close to the receiver.

5. The radio circuit in the receiver is faulty. Check the yellow LED with a known good transmitter.

6. The configuration for the function was not programmed correctly with the X8RPO Utility.

7. The solenoid coil is open, shorted or partially shorted, not connected, or the solenoid mechanism is stuck in the closed position.

These are the most common problems. To troubleshoot any of the above problems do the following:

1. If the Function LED turns on check for a magnetic "pull" on the top of the solenoid with small screwdriver or other steel object.
    a. If there is no "pull" the solenoid coil is open or the connection to it is faulty.
    b. If there is "pull" the solenoid mechanism is stuck or clogged or there is some other hydraulic issue.

2. If the Function LED does not turn on disconnect the wire going to the solenoid for that function.
    a. If the LED now functions properly then the solenoid is shorted and the output driver is shutting down.
    b. If the LED still does not turn on check transmitter key authorization in setup and also receiver programming.

3. If both those items are correct the receiver is likely faulty but further test with a known good transmitter.

X8Pro Remote Control – USB to Serial Adapter

Midcom USB to Serial Adapter Notes

USB to Serial Port Device and USB to X-8 Pro Receiver Configuration Device, FTDI chipset based.

These two devices are based on the Future Technology Devices Incorporated company's (FTDI) integrated circuit product. The devices will require drivers to be installed on the computer before they will work properly.

Install Drivers from Media

If a CD was included with this documentation or hardware, the file *"CDMxxxxx_Setup.exe"* is an executable file which will install the drivers on a Windows XP/7/8 computer. This installation application should install the correct drivers for all supported versions of Microsoft Windows.

Download and Install Drivers from Midcom Website

If a CD was not included then it will be necessary to download the drivers from the Midcom website:
- Navigate to the Midcom website "*www.midcomcorp.com*"
- Select *"Downloads" then select "Truck Builders/Installers"*
- Click on the X8 Pro button at the bottom.
- You will then see two files, the User Guide and the Setup Utility
- *Save* the utility file to your desktop, or Run the file.
- Once the download has finished and the installer has started, follow the instructions displayed on the screen.

Running the *"CDMxxxxx_Setup.exe"* file should automatically install the drivers for the integrated circuit utilized in the Midcom USB to Serial Adapter devices.

X8Pro Remote Control – X8Pro Utility Software

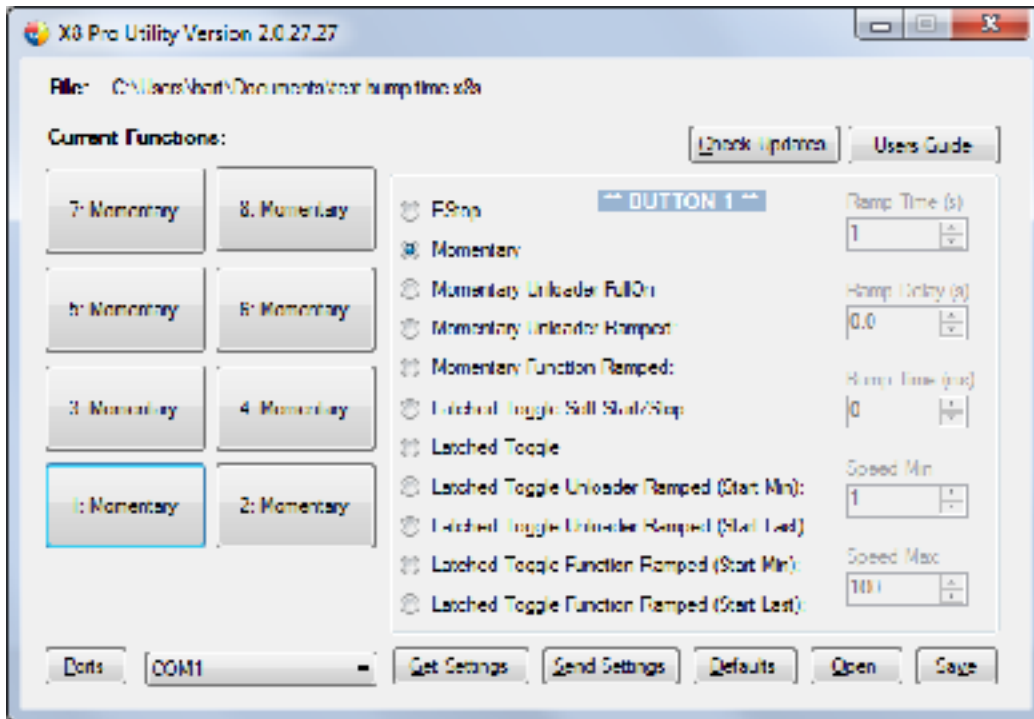## Figure 6. Desktop Shortcut

The installation program creates two shortcuts:
    1. One shortcut on the Desktop, and
    2. One shortcut in the Start Menu 'Programs\MID:COM\X8Pro'.

X8Pro Utility Software – Operation

FILE	Filename of settings last loaded/saved.
CHECK UPDATES	Check online for a new application version.
USERS GUIDE	Browse to open PDF File (this document).
COM	Select COM port to use.
SEND	Send current settings to X8Pro Receiver.
DEFAULTS	Reset all values to default.
OPEN	Load existing settings file.
SAVE	Save current settings to file.

OPERATION

- The boxes below the heading "Current Functions" represent the button positions, function numbers, and current configuration of the functions for the selected file or default settings. The buttons are shown as they appear on the transmitter.

- To modify the program for a button, select the Function Button to modify from the left and then select the function from the list to the right. If a Ramped function is selected the Ramp Time, Speed Min, and Speed Max controls will be enabled and allow Ramp adjustments.

- Select the desired COM port and then select <SEND> to send the current button functions to the X8Pro. A message will be shown indicating programming success or failure.

- The current settings can be saved or loaded from a file as desired. Select <OPEN> to load existing settings or select <SAVE> to save the settings to a file.

# X8Pro Utility Software – Hardware Connection

Figure 7. X8Pro Programming with Version 3 USB Programmer
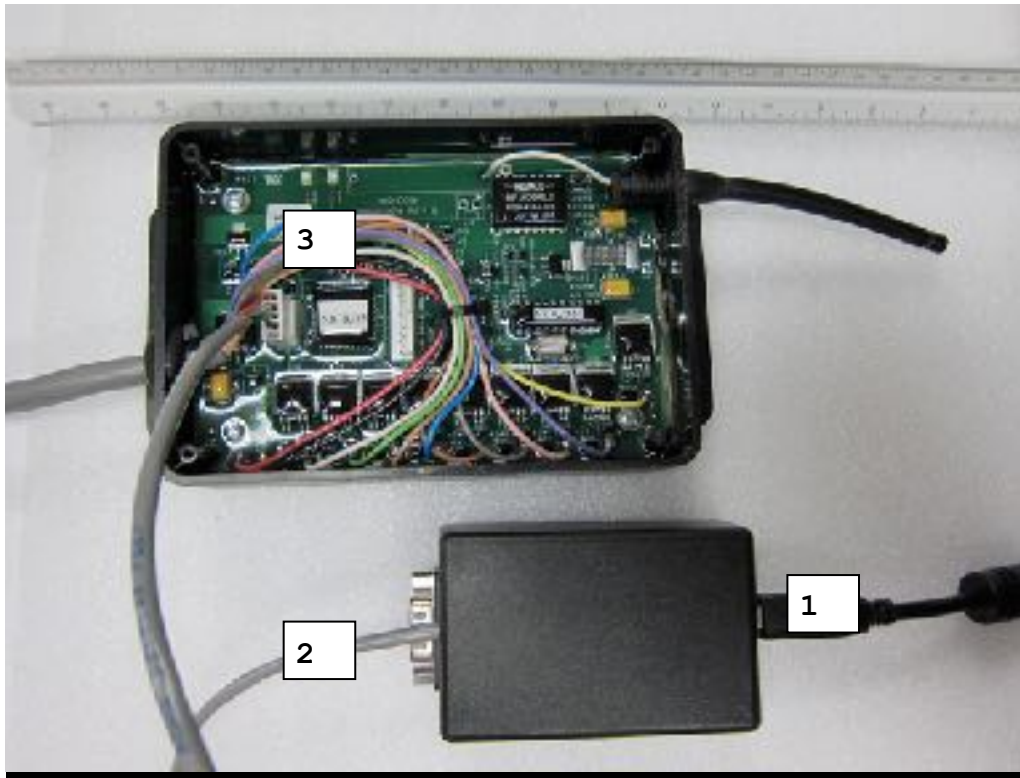
Connect the USB Cable from the USB to Serial Adapter (1) into a USB port on the laptop.

Connect the 5 pin Connector on the USB Programmer (2) to the 5 pin header on the Receiver Board (3).

1. Remove Receiver cover.
2. Connect cables as shown.
3. Power up the receiver.
4. Power up the laptop.
5. Start the X8Pro Utility.
6. Load the desired file,
     or make function changes.
7. Select <SEND>, wait for
     "settings verified".
8. Save settings as desired.
9. Disconnect Cables
10. Power down equipment.
11. Replace Receiver cover.
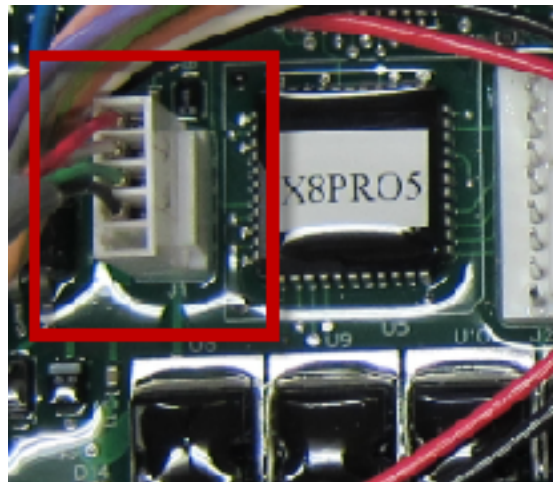
X8Pro Utility Software – Installation

Microsoft .NET Framework

The X8Pro Utility requires the .NET Framework 2.0.   The
installation program will detect that the Microsoft .NET
Framework 2.0 is not installed in the target computer, and if an
internet connection is available it will direct the end user to
a download location.

Applications and controls written for the Microsoft .NET
Framework require the .NET Framework to be installed on the
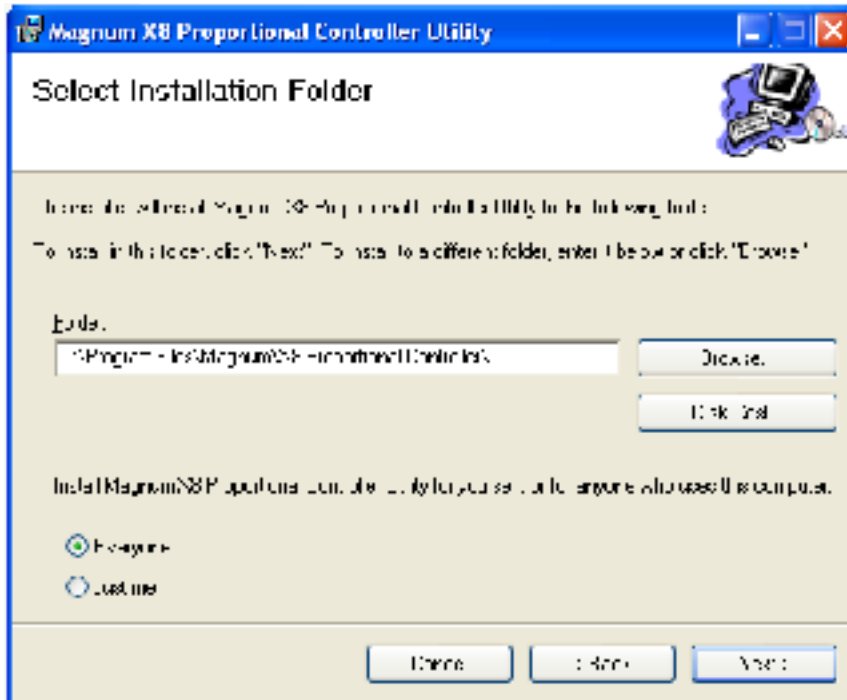computer where the application or control runs.

The installation program will detect that the Microsoft .NET
Framework 2.0 is not installed in the target computer, and if an
internet connection is available it will direct the end user to
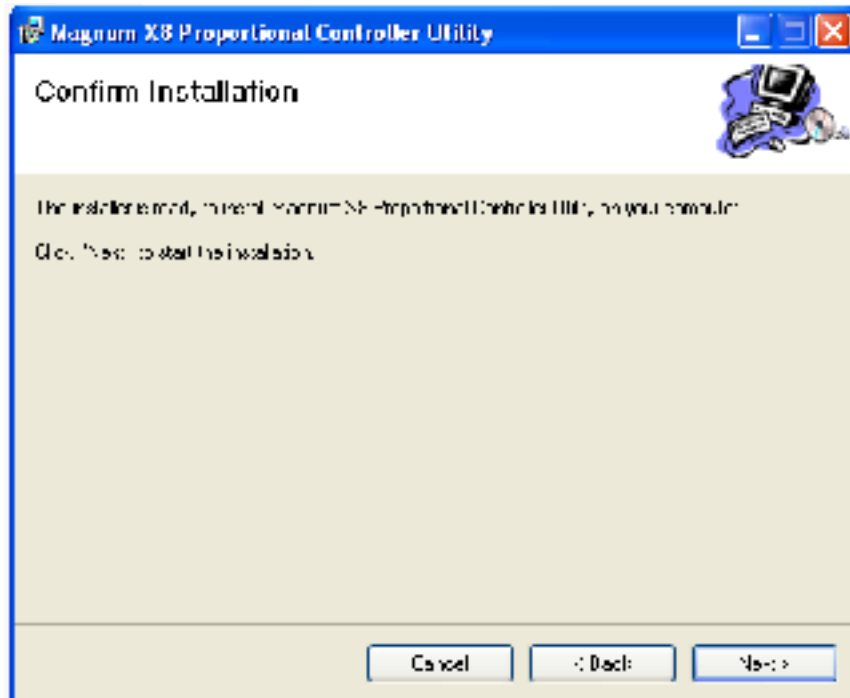a download location.

(continued)

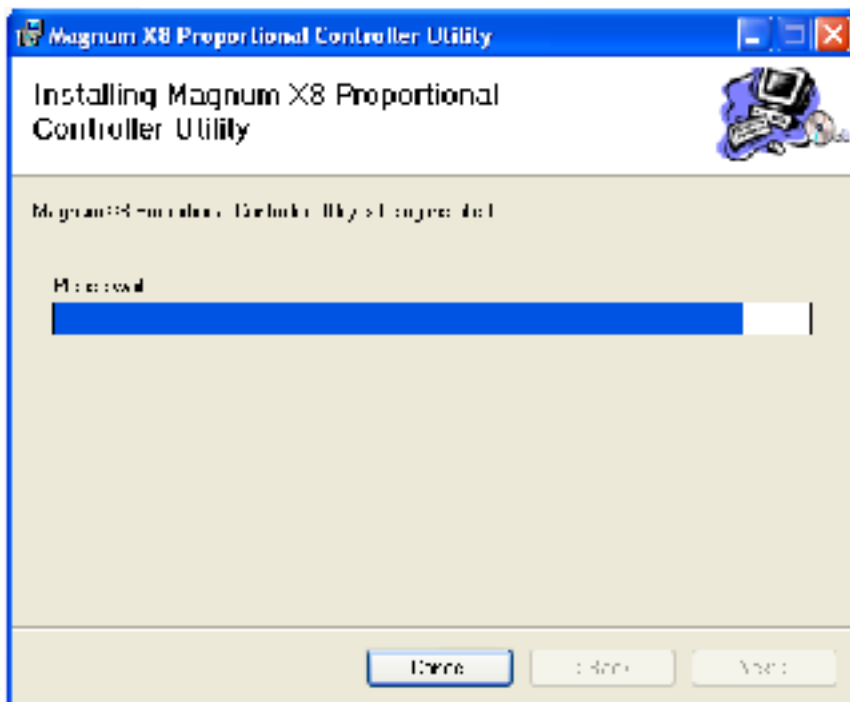**Figure 8. Installation Welcome Dialog**
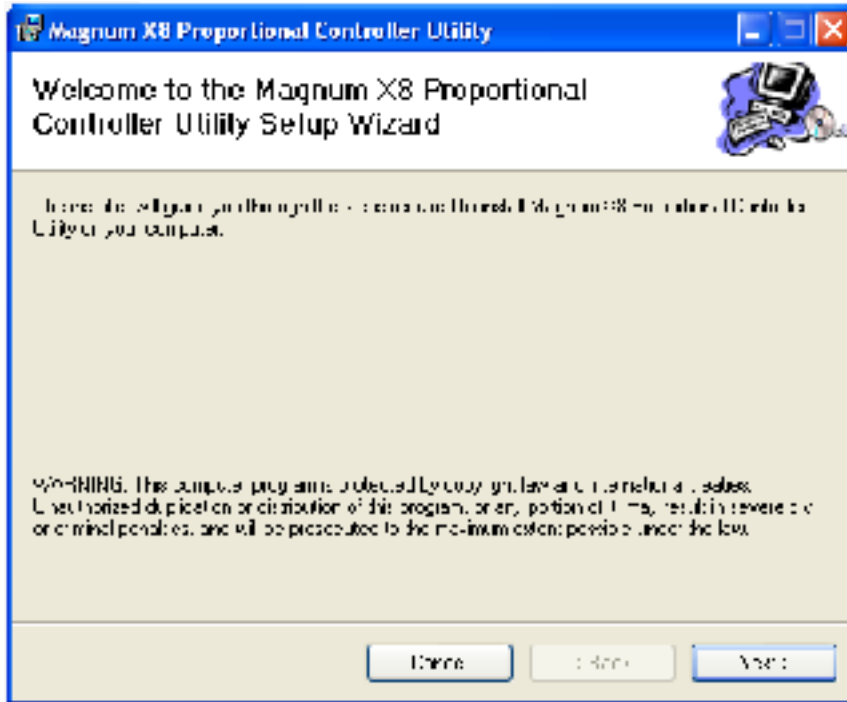
Figure 9. Select Installation Folder
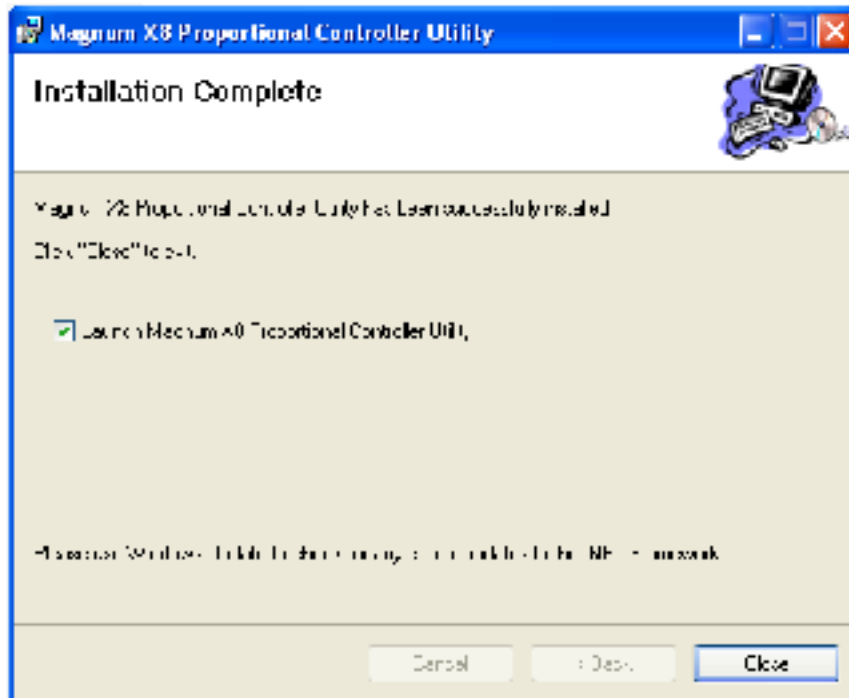
Figure 10. Confirm Installation

Figure 11. Installation Progress

Figure 12. Installation Complete

VERSION HISTORY

Version	Date	Author	Description
2.00	12/11/2012	BJS	Document Created
2.01	05/06/2013	BJS	Update Function Wires
2.02	08/02/2013	BJS	Cover and 2nd page format
3.00	06/03/2014	BJS	Serial #1050 V3 Updates
3.01	01/28/2015	BJS	Update text
3.02	09/08/2015	BJS	Added Latched Toggle Unloader Full On
3.03	10/01/2015	BJS	Update Latched Toggle Unloader FullOn
3.04	12/01/2015	BJS	Update Charging Notes
3.05	03/08/2016	BJS	Update Charging & LED Notes

Midcom X8Pro Users Guide v3.05.docx