Magnetic Switch Controller User Guide

www.iVACswitch.com

Introduction

This User Guide covers the General Description, Features and Programming of the iVAC Pro Magnetic Switch Controller (iVAC Pro MSC). The iVAC Pro MSC is the module within the iVAC Pro System that is used to control the Dust Collector and turn it on or off by interfacing with its magnetic switch. It works in conjunction with an iVAC Pro Tool Plus and/or the iVAC Pro Remote. The iVAC Pro MSC receives digital wireless commands instructing it to turn the Dust Collector on or off.

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1.0 Warnings

iVAC Pro MSC should only be installed and wired by a licensed electrician following all applicable local and national electrical codes. If you are unsure about the electrical codes in your area, consult a licensed electrician. When completed, your dust collector, with iVAC Pro MSC installed, must conform to all applicable local and national electrical codes.

Please read the operating instructions before use.
The iVAC Pro System is intended for indoor use in dry locations only.

2.0 Cautions

2.1 Minimum Run Time

The iVAC Pro MSC is designed to prevent the Dust Collector from being turned On/Off too frequently and possibly damage its motor. However it is possible that during set up and other times a user can, by using the Mode Switch turn the Dust Collector on and off too often.
The iVAC Pro MSC cannot protect against this situation.

2.2 Wait until Dust Collector Stops

The iVAC Pro MSC can be programmed to wait for the Dust Collector to come to a complete stop before restarting. The Oneida SMART™ dust collection systems have this requirement. However it is possible that during set up and other times a user can, by using the Mode Switch to turn the Dust Collector on/off too quickly.
The iVAC Pro MSC cannot protect against this situation.

2.3 Mounting iVAC Pro Modules

When mounting the iVAC Pro units they should NOT be mounted on large metal objects, since this can affect the communication range.

3.0 General Descriptions.

3.1 General Description of the iVAC Pro System

The iVAC Pro System consists of several different components:

- The iVAC Pro Tool Plus (Tool Plus). This module is used to sense the On/Off status of the power tool.
- The iVAC Pro Remote. This module enables manual control of the Dust Collector through the MSC.
- The iVAC Pro MSC. This module controls the Dust Collector via the Dust Collector's Magnetic Switch.
- Automated Blast Gates.

The following description will refer only to the iVAC Pro Tool Plus version. (Tool Plus.)

A work shop system may consist of up to eight Tool Plus units and at least one iVAC Pro MSC unit.

If a Tool Plus unit is in the Auto mode when its related power tool is powered on or off, the Tool Plus unit will transmit a command by means of a digital wireless signal to the iVAC Pro MSC, instructing it to turn on or off.

Both the Tool Plus and the iVAC Pro MSC have a series of programmable features that are set by means of the Program Switches. The Program Switches are accessible through the small removable cover in the base.

3.2 General Description of the iVAC Pro MSC

The iVAC Pro MSC has been designed to directly control the Magnetic Switch (or Magnetic Motor Controllers) used in larger Dust Collectors. It interfaces with the Magnetic Switch by means of two pairs of dry contacts. A Normally Open (NO) pair for On and a Normally Closed (NC) pair for Off. It is powered from a 5Volt USB Power Supply.

The iVAC Pro MSC receives RF commands from either iVAC Pro Remotes or iVAC Pro Tool Plus units and then either turns the Dust Collector on or off via its Magnetic Switch.

The first power tool to turn on will turn on the Dust Collector. The last power tool to turn off will turn off the Dust Collector.

It essentially operates with connections to the Dust Collectors Start and Stop switches. The Dust Collector will continue to operate normally with the Dust Collectors Start and Stop switches when connected to the iVAC Pro MSC

Operating Features.

3.2.1 Turn On Delay

When a Power Tool is turned on, the Tool Plus associated with it, sends an RF On command.

When the iVAC Pro MSC receives this On Command, it delays for 1.5 seconds (set by Switch 3 of the Program switch) and then turns on the Dust Collectors Magnetic Switch via the NO Dry Contacts.

In Auto mode, the iVAC Pro MSC now waits for any more RF Commands from any of the other Tools in its system

3.2.2 Turn Off Time

The iVAC Pro MSC remembers all the Tools that have been turned on and when all of the Tools have been turned off it starts a Turn Off Time timer which is set by the Program switches S4, S5 and S6 to 0, 5, 15, or 45 seconds.

The LED indicator on the iVAC Pro MSC is turned on when the Dust Collector is turned on. When all of the Tools have been turned off, the LED indicator will flash at a fast rate (approximately 5 x per second) for the duration of the Off Time period. At the end of this time it turns off the LED indicator, and the Dust Collectors Magnetic Switch via the NC Contacts. The LED indicator will now flash at the Standby Rate. (0.5 sec on. 4 seconds off)

3.2.3 Minimum Run Time

If in Minimum Run Time mode MRT. (see Sec 5.4.2 for a detailed description), the iVAC Pro MSC keeps track of the time when it was turned on and will not turn off the Dust Collector until the Minimum Run Time has been completed. The LED indicator will flash at a slow rate (approximately 2 x per second) for the duration of the Minimum Time period.

During Minimum Run Time the LED will flash at a rate of 2 times per second.

When all the Tools have been turned off in MRT Mode and the Minimum Run Time has been satisfied; the LED indicator and the Dust Collectors Magnetic Switch will be turned off via the NC contacts.

The LED indicator will flash at the Standby Rate.

3.2.4 Power Up Delay sequence

On initial power up of the iVAC Pro MSC there is a power up delay of 5 seconds before responding to the Mode Switch. During this time it opens the NC Dry Contacts to turn Off the Dust Collector. The LED is turned on 3 times and after the LED is turned off the 3rd time the iVAC Pro MSC is ready to operate

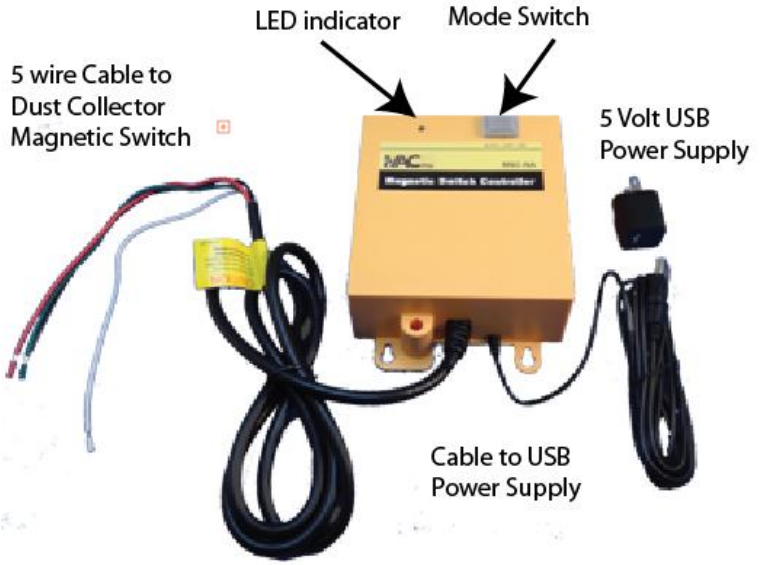
3.2.5 Wait for Dust Collector to Stop (see Sec 5.3)

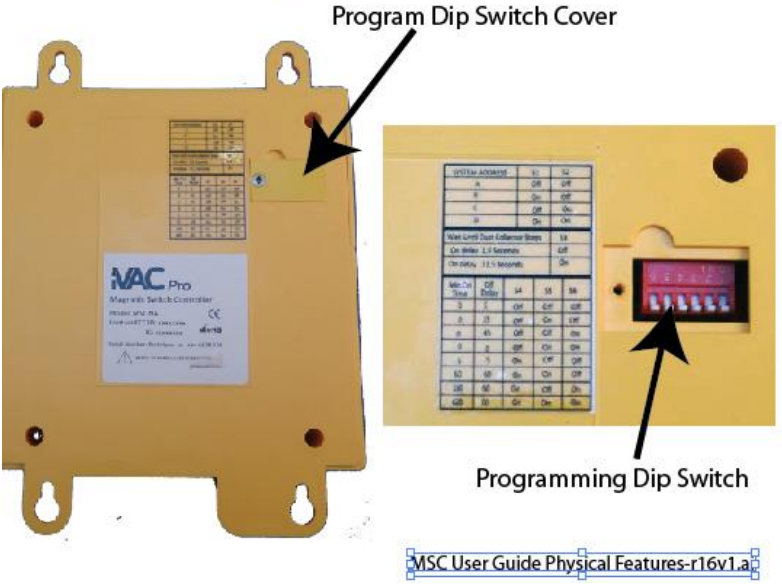
This is a safety feature required by the Oneida SMART™ dust collection systems.

If S3 is in the On position, the MSC will wait 30 seconds after it has turned Off the Dust Collector before it will restart the Dust Collector.

Any RF commands from any Pro Tool Plus or Remote units will be saved and acted upon when this 30 second delay is complete. During this time the LED will repeat a pattern of pulsing on rapidly 2 times then off for 1/2 second

3.3 Physical Features





MSC User Guide Physical Features-r16v1.a

4.0 Mode Switch Features

The iVAC Pro MSC has three modes of operation; Auto – Off – On, as set by the Mode Switch.

Auto Mode,

When the iVAC Pro MSC receives information from a Tool Plus, or iVAC Pro Remote it will turn the Dust Collector on or off as instructed.

Off Mode,

The iVAC Pro MSC will maintain the Dust Collector in an off state.

On Mode,

The iVAC Pro MSC will turn the Dust Collector on.

5.0 Programmable Features

5.1 System Address

By means of the Program Switch the iVAC Pro MSC can be assigned to work on one of four System Addresses, A, B, C or D. The System Address is to enable up to four systems to operate independently while within communication range of each other.

All units required to operate together must be set to the same System Address.

System Address	S1	S2
A	Off	Off
B	On	Off
C	Off	On
D	On	On

System Address Programming. All switches shown in Off position.

Note: All changes to Program Switch settings must be made with the Mode Switch OFF.

5.2 Turn On Delay

The Turn On Delay is to avoid two power surges occurring at the same time on an AC mains circuit that is feeding both the power tool and the dust collection system. This feature is to avoid tripping the main circuit breaker.
The Turn On Delay time can be set to 1.5 seconds by means of the Program Switch.

Note: All changes to Program Switch settings must be made with the Mode Switch OFF.

On delay Time	S3
1.5 Seconds	Off
1.5 Seconds And Wait until dust collector stops (30 sec wait)	On

5.3 Wait until Dust Collector Stops

If S3 is in the On Position the iVAC Pro MSC will wait 30 seconds after it has turned off the Dust Collector before it will it will restart the Dust Collector.

Any RF commands from any Pro Tool Plus or Remote units will be saved and acted upon when this 30 second delay is complete.

During this time the LED will repeat a pattern of pulsing on rapidly 2 times then off for 1/2 second.

5.4 Turn Off Time and Minimum Run Time

5.4.1 Turn Off Time

The Turn Off time is to allow the Dust Collector to continue to run after a power tool has been turned off. This feature is to clear up any remaining debris at the power tool and in the ducting. It may also be used to avoid quick cycling of the dust collection system.

This is the delay time from when the iVAC Pro MSC receives a valid RF Off command from an iVAC Pro Remote or Tool Plus telling it to turn off. The times are: 0, 5, 15, and 45 Seconds

5.4.2 Minimum Run Time

Larger Dust Collectors can be damaged if they are turned On/Off too frequently. The iVAC Pro MSC has the ability to make sure that the Dust Collector runs for a Minimum Run Time. The iVAC Pro MSC calculates the time since the Dust Collector was turned on and ensures that the Dust Collector has run for at least the Minimum Run Time as programmed. The Minimum Run Time is either 2, 4, or 8 minutes. For example, if the Minimum Run Time setting is for 8 Minutes, and the iVAC Pro MSC receives an RF Off Command after only 3 minutes, it will wait for another 5 minutes before turning off the Dust Collector. If the iVAC Pro MSC receives an RF Off Command after the Minimum Run Time is met, then the iVAC Pro MSC will delay by the Turn Off Time before turning off the Dust Collector.

Note: All changes to Program Switch settings must be made with the Mode Switch OFF.

S4	S5	S6	Off Time	Min Run Time
Off	Off	Off	5 sec	0
Off	On	Off	15 sec	0
Off	Off	On	45 sec	0
Off	On	On	0	0
On	Off	Off	5 secs	0
On	On	Off	1 MINUTE	1 MINUTE
On	Off	On	1 MINUTE	3 MINUTES
On	On	On	1 MINUTE	7 MINUTE

5.5 Mode Switch

The Mode Switch can be set to Auto, OFF or ON.

When no USB Power is supplied to the iVAC Pro MSC, regardless of the Mode Switch position (Auto or OFF or ON) The iVAC Pro MSC will have no impact on the Dust Collector.

NOTE: This will allow the ON/OFF switches on the Magnetic Switch Device to operate as they normally would without the iVAC Pro MSC attached.

After Power is supplied to the iVAC Pro MSC the Initial Power Up Delay sequence is performed (Sec 3.2.4)

NOTE: When operating normally after the initial Power Up Delay the iVAC Pro MSC only saves the Program Switch information while it is in OFF Mode.

5.5.1 AUTO Mode

After the initial Power Up Delay, if the Mode Switch is in AUTO Mode, the iVAC Pro MSC starts to respond to commands from Tool Plus and iVAC Pro Remote units

5.5.2 ON Mode

If the Mode Switch is in the ON mode when it is powered up, it WILL NOT turn on the Dust Collector, but when moved to OFF mode, it will turn Off the Dust Collector and the settings of the Program Switch will be saved.

If the Mode Switch is now set to On, the Dust Collector will be turned On.

5.5.3 OFF Mode

If the Mode Switch was in OFF mode at the time of the Power Up Delay sequence it will maintain the Dust Collector in an Off state.

The Program Switch setting will be stored.

NOTE: The Turn On Delay setting by the Program Switch #3 is ignored when the Mode Switch is moved from Off to On.

When the Mode Switch is moved back to the Off position the Dust Collector will be turned off immediately.

When the Mode Switch is moved to the Auto position, the iVAC Pro MSC will delay for approximately 2 seconds and then begin responding to Tool Plus Commands.

NOTE: there will be no significant delays so it is important the operator does not move the Mode switch too quickly, AND the operator is responsible for not violating the Dust Collectors Minimum Run Time conditions

6.0 Master Reset

In today's environment there are many house hold items that use radio frequency communications. In the event that the iVAC Pro MSC stays on due to a collision of radio frequency transmissions, the iVAC Pro MSC can be reset by removing its power by disconnecting its USB Power Supply for approximately 5 seconds.

7.0 LED Indicator

The LED indicator has several different states:

Power Up Sequence

LED flashes, 1 second On, 1 second Off, repeats 3 times.
During Power Up Sequence.

Standby Rate

LED flashes 0.5 second On, 4 seconds Off. .
The iVAC Pro MSC has turned the Dust Collector Off and maybe in Auto or Off Mode.

Dust Collector On

LED is On. .

Minimum Run Time. (Sec 3.2.3)

LED is flashing at a slow rate of approx. 2 times per second.

Turn Off Time (Sec 3.2.2)

LED is flashing at a fast rate of approx. 5 times per second. ()

Wait for Dust Collector to Stop. (Sec 3.2.5)

LED flashes a repeating pattern of pulsing on rapidly 2 times then off for 1/2 second.

8.0 . iVAC Pro Magnetic Switch Controller Specifications:

8.1 Physical/ Electrical

- Housing is approximately 5” x 5” x 2” ABS 94V0 plastics.
- One set of normally open Relay contacts and one set of normally closed Relay contacts
- Contact rating is 1 Amp, 250VAC
- Relays are pulsed for 700msec for Turn On and Turn Off

5 conductor Control Cable 2Meters

External Ground terminal

- Range, forty feet, line of sight.
- Ambient operating temperature range, 0 – 30C

8.2 Programmable features.

- One of four System Addresses. A, B, C or D.
- One Turn On Delay (1.5 Sec) or Wait for Dust Collector to Stop. (30Sec)
- One of four Turn Off Times. 0, 5, 15 or 45 Sec
- One of four Minimum Run Time settings of 5 sec, 2 min, 4min or 8 min.

8.3 Regulatory Approval.

- CE certification

9.0 System Set Up

9.1 Location

When mounting the iVAC Pro Tool Plus and iVAC Pro MSC units they should NOT be mounted onto large metal objects, since this can impact the operational range between the units. The range of forty feet is based on line of sight communications. Communications through walls may impact the forty foot range.

9.2 Setting System Address

It should be noted that for Tool Plus and iVAC Pro MSC units to work together they must be set to the same System Address. Both the Tool Plus and iVAC Pro MSC are shipped with the system address set at Address A. This can be changed if there is a clash with an adjacent system or if two systems are used in the same workshop.

The System Address is set by means of positions 1 and 2 on the Program Switch.

9.3 Setting Turn Off Time

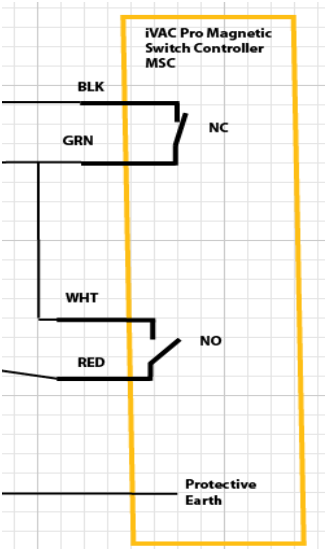
After the iVAC Pro MSC has been instructed to turn off by an iVAC Pro Tool Plus or iVAC Pro Remote there is a programmable delay to enable all dust to be cleared from the system. The iVAC Pro MSC is shipped with the Turn Off time set at 5 seconds. The time can be set to 0, 5, 15 or 45 seconds.

The Turn Off time is set by means of Program Switches 5 and 6.

10. Technical Information

The following pages contain technical information relating to the connection of the iVAC Pro MSC to a Dust Collector Magnetic Switch (NVR switch.) or Magnetic contactor or Magnetic Motor Starter. These terms (names) tend to be used interchangeably, although there are some differences mainly whether the units have Over Current protection and/or auxiliary Start/Stop switches integrated with them.
The 5 wire cable from the iVAC Pro MSC is connected to the Start and Stop switches of the Magnetic Switch.
The Normally Open Contacts (NO), wire color White and Red, are connected across the Start Switch.
The Normally closed contacts (NC), wire color Black and Green are connected in series with the Stop Switch
The Protective Earth wire is connected to a grounded surface at the Dust Collector.

The two relays in the iVAC Pro MSC are type C contacts, meaning they have a Common connection and a normally closed contact and a normally open contact.

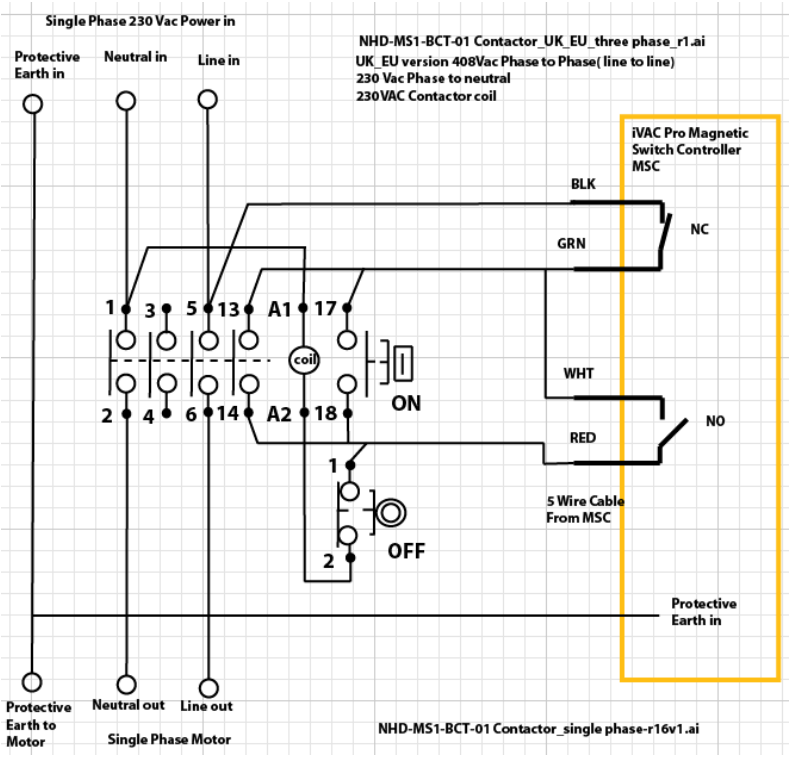

iVAC Pro Magnetic
Switch Controller
MSC
BLK
NC
GRN
WHT
NO
RED
Protective
Earth

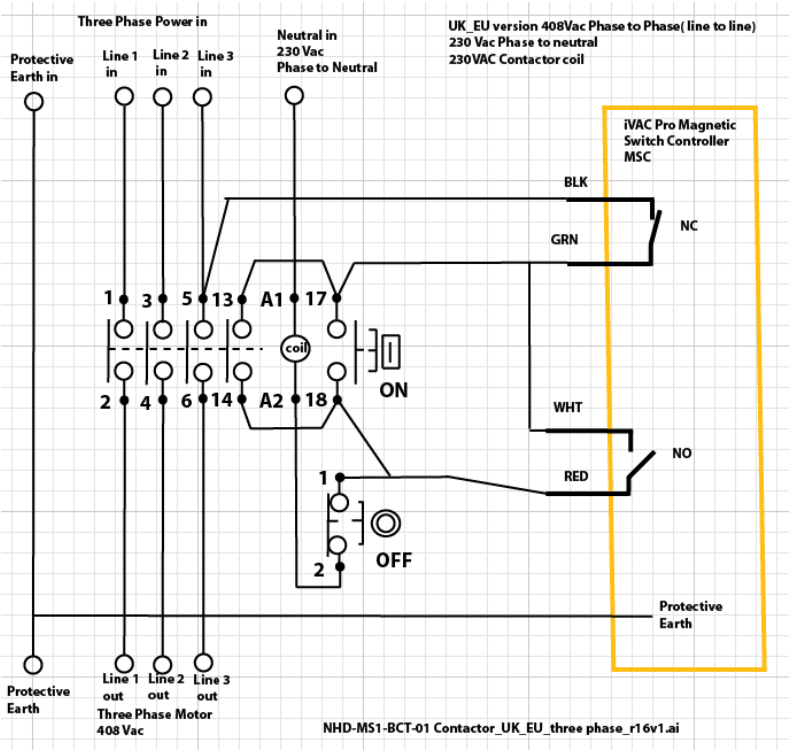
11.0 Typical wiring circuit from the iVAC PRO MSC to Dust Collector.

NOTE:

The following examples show how to connect the iVAC Pro MSC to single and three phase Contactors.

For more examples connecting to specific Dust Collector go to the iVAC SWITCH web site at: https://ivacswitch.com





All Wiring should be made by a licensed electrician due to electric shock hazard.

12 Warranty

See attached Information sheet from local supplier

13. Contact:

See attached Information sheet from local supplier