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Agroponic Industries Ltd.

Root Seller

# ALBERTA NEWS

Production Growing Facility  
Fort Saskatchewan,  
Alberta



How to Control Five Independent Zones ?

## FREESTANDING HOUSES 1, 2, 3, 4 AND 5

Environmental Control Upgrade

### The Question and the Solution.

*“ How do you control five independent freestanding greenhouses, each requiring separate environmental control, with an easy to install, easy to program, easy to use, central controller. And to make the task a bit more daunting, to control of roof vents, two stages of heating, have wind protection override and provide 12 irrigation and mist control zones and still have the ability to add future equipment and sensors. And finally, to be very affordable..”*

**The solution was simple.** Simply start off with a basic Microgrow Growmaster Procom control unit. Add five temperature sensors, one for each house. Add a Microgrow Weatherstat for basic wind protection, a Microgrow Procom Expansion Module ( additional 12 control outputs ) and finally a 12 zone Water Max Irrigation and Misting Control and still provide future space for future sensors and control outputs.

**Costly .... No. Affordable ... Yes**

Let's look inside.



Control of Freestanding Greenhouses.

## INDEPENDENT ZONES



### Five Independent Zones

Control for each roof vent.  
( Up to eight stages of opening and closing )

Control for each unit heater  
( 2 heaters per zone capable of 2 stages of heating )

Wind speed protection

12 Irrigation Zones

Central Controller Location

### System Notes.

For this project, all the controls were located in the client's central heated pack/storage/header building.

The independent freestanding houses were comprised of five 30 foot wide structures, of which four were 96 feet long and one at 144 feet long. All the houses were standing in line and were about 12 feet apart.

All control cabling (ie 24 VAC cabling was 18 gauge LVW and the sensor cabling was 22 gauge stranded cabling). All cabling was daisy chained from freestanding greenhouse to freestanding greenhouse via flexible waterproof conduit and weatherproof service junction boxes. The cables were all routed back into the central header room area. Considering there was still snow on the ground the installation of all the service cabling went in quite easily.

All the equipment was installed in a small clear wall and accessible location in the central pack/header room.

An exterior weather sensor set c/w wind speed, temperature and rain provided exterior weather data to the Weatherstat which in turn relayed this information to the Procom unit to provide basic vent/greenhouse protection against high wind and or rain protection.

Now all control operations, viewing, setting the set points etc. were now all possible from the central header area. The client no longer had to walk outdoors to each freestanding greenhouse to see if "things" were actually okay in both terms of temperature and equipment operation. And if the previous historical data was needed it was at their finger tips.

No more fighting between independent sensors ( energy savings ), proper controlled heating stages ( more increased energy savings ) and true eight stage cooling/ventilation control ( more increased energy savings ), which leads to a more favorable environment for optimal plant growth.



Various  
Crops require  
Various  
Conditions

## System Installation at a Glance

Take a close look at the Microgrow System Photo below. A photo of a Microgrow Procom Unit with and expansion module. Notice the LED display is currently indicating the indoor temperature and humidity. ( The unit can be programmed in Imperial or Celsius. ) Notice that the top LED light is lit, indicating the unit is running. Right now nothing is running but notice on each of the outputs a toggle switch is provided for hand-off-auto control. All the switches are in the off mode. That is the reason there are no running lights. The hand-off-auto switches are a real time saver. If you don't wish for something to run, well, just turn off the switch.

The Procom unit is on the left. The expansion module is on the right. Notice 8 of the expansion module outputs are not assigned or presently used. This is called expansion. Say some time in the future the grower wishes to add carbon dioxide, energy curtains, fog, photo lighting etc. Well these control features can be

added simply by wiring up the outputs and telling ( programming the controller ).

This system is currently controlling just under 43,000 sq. feet of greenhouse space with three zones. And it only takes less than 4 feet feet of wall space. Wow .....

At a flick of a switch the grower can change all heating, cooling, humidity set points, review the previous 21 days of historical information, adjust day, mid day, evening and night temperatures or DIF. Basically the whole nine yards.

There is no line voltage wiring any where. All control is via 24 VAC low voltage wiring to relay or contactor boxes out in the greenhouse near the equipment serviced. This really ( significantly ) reduces the electrical installation costs.

**Welcome to the big bang for the buck and it doesn't stop here.** Add on energy savings and dependability and the savings multiply.



## COMPONENTS



### The basic building blocks

Start off with a basic Procom Unit as illustrated on top photo.

Add a Weatherstat for wind and rain protection for the vents

Add a 12 zone Water Max for irrigation and mist control.

**And ... bingo, a system.**

# GROWMASTER PROCOM

The power, flexibility and features at a glance

## Input Points List.

The Input Points List for this Project

- Input one : Temp Sensor for FS # 1
- Input two : Temp Sensor for FS # 2
- Input three : Temp Sensor for FS # 3
- Input four : Temp Sensor for FS # 4
- Input five : Temp Sensor for FS # 5
- Input six : Future / Spare
- Input seven : Future / Spare
- Input eight : Future / Spare

Note: when reviewing the above list there are three locations where future sensors could be added. These could be humidity sensors, carbon dioxide sensors etc.

## Output ( Controls ) Points List.

These are the devices that do the equipment controlling.

- Output 1 : Vent open FS # 1
- Output 2. Vent close FS # 1
- Output 3 : Vent open FS # 2
- Output 4. Vent close FS # 2
- Output 6 : Vent open FS # 3
- Output 7. Vent close FS # 3
- Output 8 : Vent open FS # 4

- Output 9 : Vent close FS # 4
- Output 10 : Vent open FS # 5
- Output 11 : Vent close FS # 5
- Output 12 : Heating FS # 1
- Output 13 : Heating FS # 1
- Output 14 : Heating FS # 2
- Output 15 : Heating FS # 2
- Output 16 : Heating FS # 3
- Output 17 : Heating FS # 3
- Output 18 : Heating FS # 4
- Output 19 : Heating FS # 4
- Output 20 : Heating FS # 5
- Output 21 : Heating FS # 5
- Output 22 : Future / Spare
- Output 23 : Future / Spare
- Output 24 : Future / Spare

Note: When reviewing the above lists there still remain three future control outputs for future equipment or control use. If at this time the panel becomes full another zone expander module can be added to provide an additional 12 control points. ( The building block feature. It is a great design method ).

## Programming

All of the inputs and outputs are field programmable. They can be changed into any combination that of zones, sensors and equipment that a grower may have. The only limitation that each Growmaster Procom unit has is :



We work hard for you

- Five zones maximum.
- Eight input sensors maximum.
- 36 control outputs maximum. ( two extra zone expansion modules added.

In the real world this doesn't happen often and if it does, due to greenhouse size and layout etc. it maybe more beneficial to install an additional Procom unit. This cost of course could be easily displaced by the increase in installation costs resulting from greater cabling costs.

## Remote Computer Control

Yes, via our Growlink software loaded onto your PC, the controls can be operated remotely and very easily I might add.

## Microgrow Controllers

Wide range of control devices, from the small single function, single zone controllers to large computer/ microprocessor based multi zone, multi function controllers. **We have a solution for you.**

## Reputation

- over 20 years of active greenhouse control innovation, products and service
- control solutions that make common sense.

## Contact Us

Let's explore your control solutions together.

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