

THE FUTURE OF INTELLIGENT FARMING

FALL 2022

THINK BIG GROW FAST

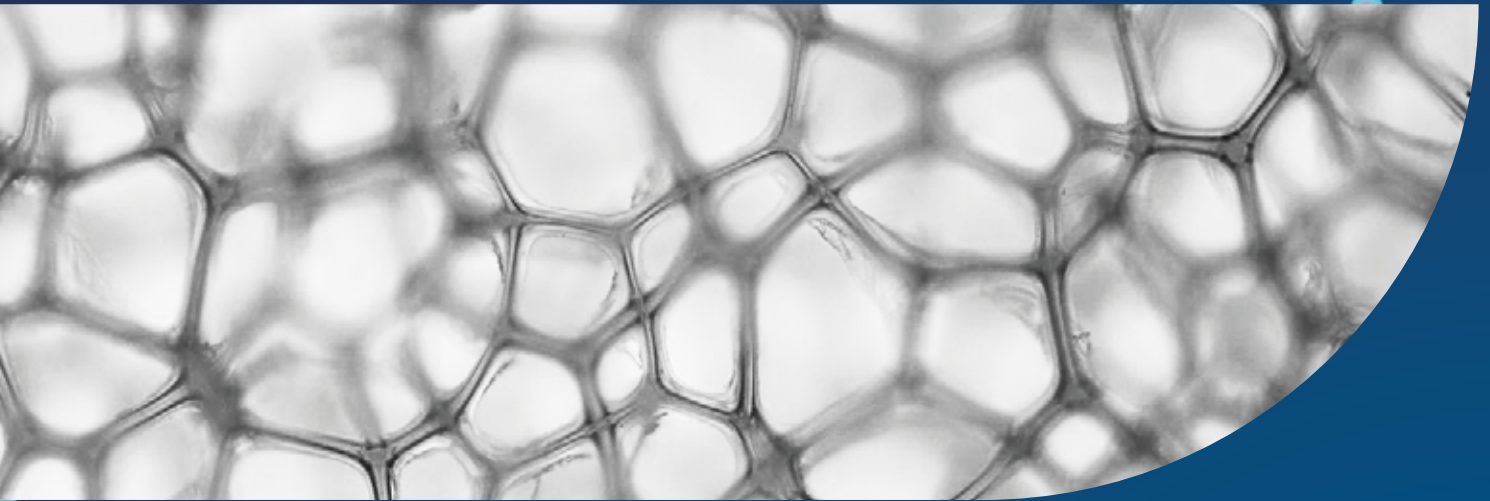
/ TROLMASTER

Hydro-X Environmental Control System
Aqua-X Irrigation Control System
Carbon-X CO2 Alarm System
Controller Cabinets
Single Task Controllers

/ THINKGROW

Multiple-Bar LEDs
Single-Bar LEDs
Smart Light Lifter System
Daisy Chain Power Cord System
Accessories

TrolMaster
ThinkGrow



About Us

TrolMaster Agro Instruments Co., Ltd. is an agriculture technology company, offering professional-grade environmental control systems within the horticultural market. All of TrolMaster's equipment is designed to be easy to use and reliable. Another main advantage we offer is the ability to expand or upgrade your control system as your facilities' needs evolve. Our controllers are cost-effective, and are simple to operate providing the greatest efficiency possible for your grow facility. Here at TrolMaster, we strive for excellence in providing customers with first-class products, and great service with complete customer satisfaction being our only goal.

TrolMaster has deep roots in the horticulture and controller industries. Our Hydro-X series covers each grower's needs with incredible flexibility, from small home hobby growers to large industrial facilities. Our control system platform offers remote access capabilities that enable our customers to manage every aspect of their grow facilities from anywhere anytime. We deliver automation, control, data collection, monitoring, and crop optimization. We ensure that we provide our growers with the most innovative and reliable environmental control system possible, while also focusing on designing simple-to-use and easy-to-understand reliable control systems.

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ThinkGrow

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Alerts and Remote Control: APP Web-based

Main Controller

Hydro-X Controller (HCS-1)

Level 1



Temp 4 Humid 2 CO2 2 Time 9		
Complete Single-room Environmental Control System	Control up to 512 light fixtures (256 per channel)	Modular Design & Fully Customizable
Complete Controlled Device Capacity	Historical Chart	Compatible with the free TrolMaster App

The Hydro-X (HCS-1) system is a complete environmental control system, designed to automatically control indoor and greenhouse environments. It is designed to be **modular and fully customizable**, optimized to control all devices within a single growing zone.

The HCS-1 comes standard with a multipurpose 3-in-1 (temperature/humidity/photocell) combination sensor, the MBS-TH. The MBS-TH sensor, an optional CO2 sensor, smoke and water detectors can be **daisy-chained** to the HCS-1 SENSOR port using the provided RJ12 communication cables. There are 2 lighting control channels on HCS-1 that

can control 98% of the grow lights sold in the market. The HCS-1 control system can operate **two different lighting systems** at the same time, with separate setpoints. HVAC systems, mini-split air conditioners, commercial dehumidifiers/humidifiers, as well as CO2 generators or regulators and even basic irrigation/fertigation systems can be controlled by the HCS-1.

The HCS-1 comes with an Ethernet connection and with the free TrolMaster App, users could access/change settings and receive user alerts (notifications) on their smartphone from anywhere, anytime.

Hydro-X PLUS Controller (HCS-3)

Level 2



	Temp 8 Humid 8 CO2 4 Time 12		
Advanced Environmental Control System	Control up to 512 light fixtures (256 per channel)	Advanced Lighting Control Function	Modular Design & Fully Customizable
7" LCD Touchscreen	Expanded Controlled Device Capacity	Historical Chart	Compatible with the free TrolMaster App

The Hydro-X Plus (HCS-3) controller is an **upgraded version** of the Hydro-X controller. It features a 800x480 7" LCD touchscreen, multiple advanced light control functions and expanded device control capacity. The HCS-3 can control up to 512 light fixtures connected to two separate "channels", 8 temperature devices, 8 humidity devices, 4 CO2 devices, and 12 programmable timer devices (with up to 50 schedules per day each). Having the option to use multiple control modules also allows the user to create multiple "stages" of temperature and humidity control, which will provide a more stable environment in the grow area.

The HCS-3 comes with a MBS-PRO 4-in-1 sensor to measure temperature, humidity, CO2 ppm, and a photocell to detect the presence of light. The optional MBS-PAR light sensor can be added

to the system. It will automatically adjust light intensity to precisely provide the exact amount of illumination for optimum plant growth. Up to 10 smoke detectors and 10 water leak detectors can be connected to the HCS-3 which will alert you if there is smoke in the grow area or water leaks. If a problem is detected by the HCS-3, a warning user notification will be sent to your smartphone App.

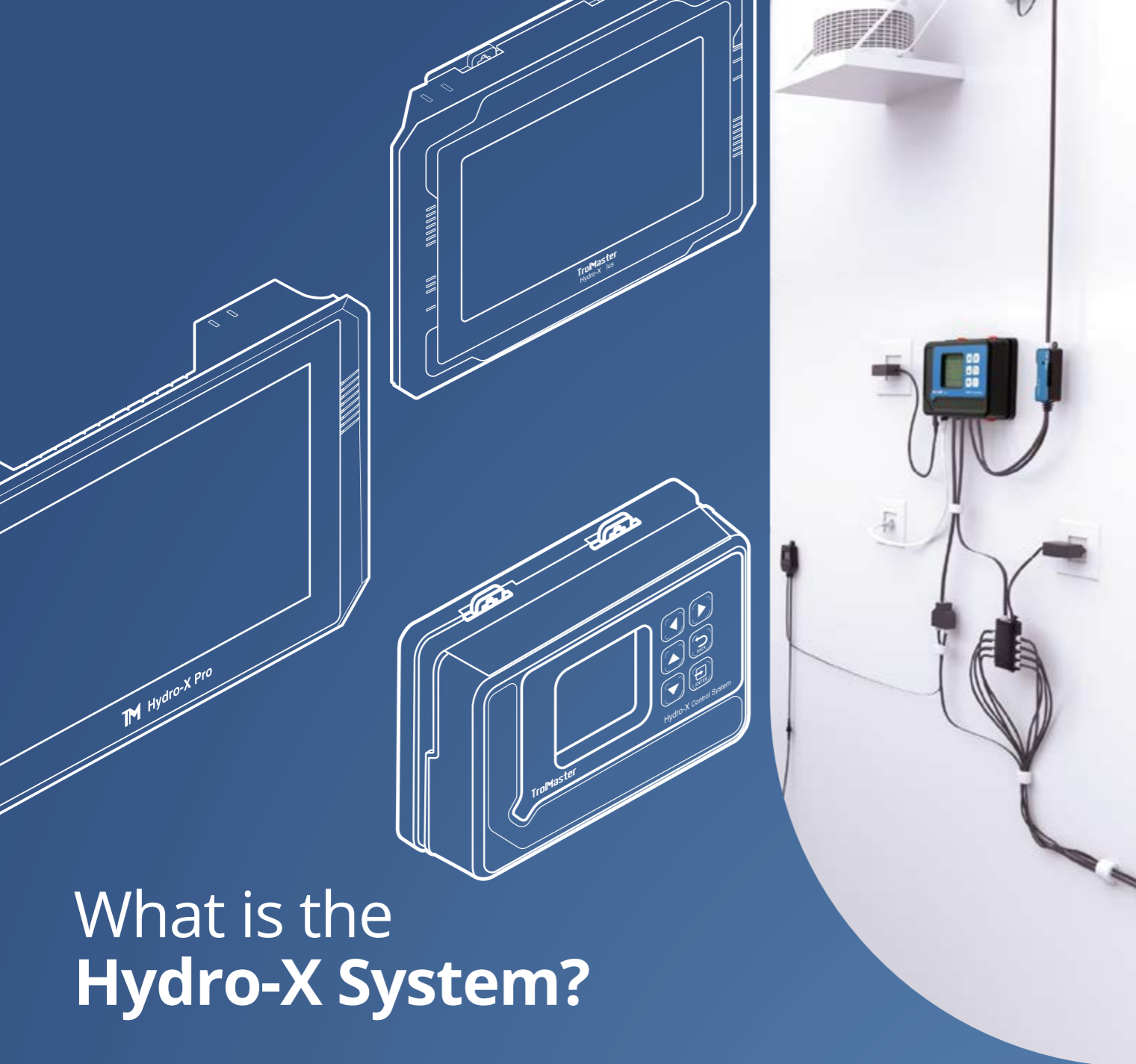
Having 2 separate lighting control channels allows the users to create multiple lighting layouts and dimming sequences based on their individual preferences. Advanced lighting control functions including DLI Control, Spectrum Control, Group Control, and Cloud Control can also be operated on the HCS-3. With incredible controllability and the expanded capacity of HCS-3, users can easily customize their grow room control system for maximum yields.

What is the Hydro-X System?

The Hydro-X/HCS series of controllers are professional-grade and modularly designed environmental control systems. The HCS controller is the "brain" of the system which is capable of supporting and connecting to various TrolMaster control modules and sensors. Most TrolMaster modules and sensors are forward and backwards compatible which allows them to be used with any of the HCS / Hydro-X controllers. By offering several models of HCS / Hydro-X controllers, each customer can choose the PERFECT controller for their facility ranging

from a single small grow room, to a large professional-grade and modularly designed environmental control systems. The HCS controller is the "brain" of the system which is capable of supporting and connecting to various TrolMaster control modules and sensors. Most TrolMaster modules and sensors are forward and backwards compatible which allows them to be used with any of the HCS / Hydro-X controllers. By offering several models of HCS / Hydro-X controllers, each customer can choose the PERFECT controller for their facility ranging

Hydro-X System Overview Video



Main Controller

Alerts and Remote Control: APP Web-based

Hydro-X Pro Controller (HCS-2)

Level 3



Professional Environmental Control System	Up to 50 sensors and control modules can be connected	Control up to 512 light fixtures (256 per channel)	Modular Design & Fully Customizable
10.1" LED Touchscreen	Multiple Sub-zones by linking sensors to control modules	Historical Chart	Free Smartphone App plus Web-based control system

The Hydro-X Pro (HCS-2) is a professional-grade environmental control system. It features a 10.1" touchscreen and is backward compatible with all current Hydro-X control & device modules. What sets the HCS-2 apart from the HCS-1 and HCS-3 is how it provides greater flexibility and more advanced functions that are unique to the HCS-2 controller. The Hydro-X Pro expands the capability by allowing up to **50 sensors and 50 control modules** to be connected to HCS-2. Multiple sub-zones can be created within the single grow space by linking a specific sensor to specific control

functions. The HCS-2 comes standard with a 4-in-1 (Temp/Humidity/CO2/Photocell) sensor. For more accurate measurements, the user can add multiple MBS-PRO sensors to take measurements from multiple locations within the room. Each of the variables can be controlled independently, meaning a customized ramp-up/down can be created to closely simulate natural outdoor conditions, and to allow complete customization of the environment by the user. The customized line chart is displayed on an easy-to-read graph.

The Hydro-X Pro controller, DESIGNED for growers, by growers.

Provide the greatest controllability and features, covering all commercial growers' needs.

The Hydro-X Pro can control almost all horticultural lighting systems (LED/HID) in the market using one of TrolMaster's LMA series of lighting adapters. Two separate lighting control channels allow users to control two different lighting systems with separate set points.

Spectrum Control: (with ThinkGrow "PLUS" series LEDs)

Provide the ability on adjusting UV, White, Deep Red and Far Red spectrum individually for creating special light recipes.

Group Control: (Up to 10 groups of lighting & spectrum groups)

Lighting control for ThinkGrow LEDs allows a customized combination of light settings for up to 10 separate groups & spectrum groups of LEDs on a single HCS-2 controller.

DLI Control (Daily Light Integral) (with MBS-PAR Full Spectrum Quantum Sensor)

Calculate the amount of light needed based on the PPF to enhance growth rates and save energy.

Cloud Effect: Simulate natural cloud movements to mimic a natural outdoor environment, ensuring less plant stress and saving electricity.

Built-in Calendar Control

Calendar presets allow the user to schedule an entire crop's recipe within the system. All environmental settings can be specified by the user as they "build" their multi-week crop schedules. When complete, the user then activates the Calendar Control function and the HCS-2 will take over all daily/weekly changes automatically. Reminders can also be programmed into the calendar to ensure critical tasks are not forgotten.

Free App + Web-based console

The HCS-2 is also compatible with the app to receive live notifications. The web-based console provides easy access to remote control ability using a desktop, laptop or tablet through the internet. Onboard data acquisition and the ability to store and share settings between multiple devices, means that user-defined programs & settings can be saved and loaded into multiple Hydro-X Pro units with ease.

Hydro-X Controllers Comparison

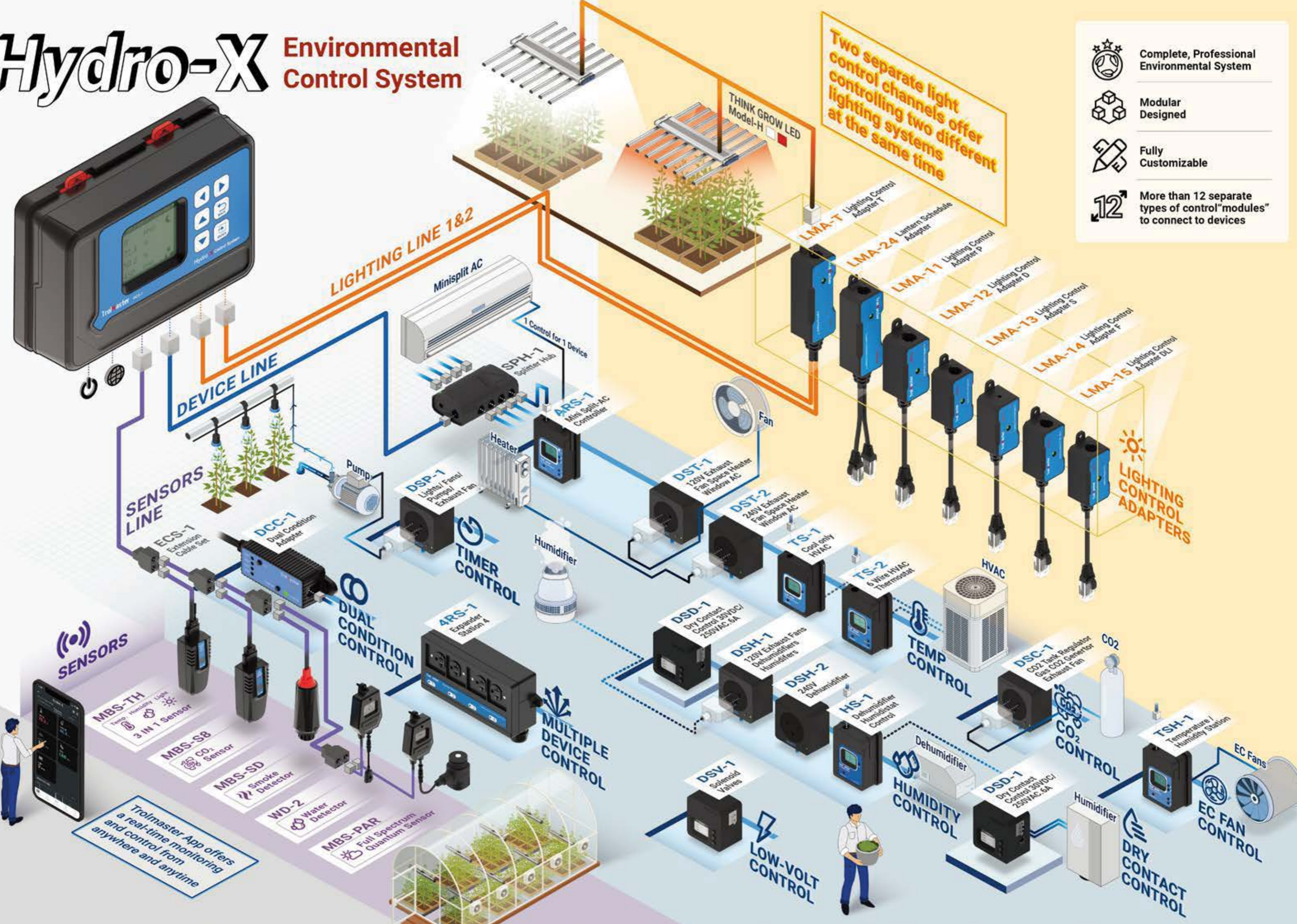
	Hydro-X (HCS-1)	Hydro-X PLUS (HCS-3)	Hydro-X PRO (HCS-2)
Quick Look			
Display	Backlit 128 x 128 LCD Display	7" LCD Color Display	10.1" LED Color Display
Control	Button Control	Touchscreen Control	Touchscreen Control
Save / Copy / Import / Export Data	Micro-SD	Micro-SD	Micro-SD
Firmware Update	Micro-SD	Micro-SD / Online	USB / Online
Package Content	Hydro-X Controller x 1 Commercial 3-in-1 Sensor x 1 RJ12 Cable Set x 1 Mounting Plate x 1	Hydro-X Plus Controller x 1 Commercial 4-in-1 Sensor x 1 RJ12 Cable Set x 1 Mounting Plate x 1	Hydro-X Controller x 1 Commercial 4-in-1 Sensor x 1 RJ12 Cable Set x 1 Mounting Plate x 1
Product Capacity			
MAX. Number Of Sensors			
3-in-1 Sensor (Temperature, Humidity, Day/Night)	Max. 1 pc	-	-
CO2 Sensor	Max. 1 pc	-	-
4-in-1 Sensor (Temperature, Humidity, CO2, Day/Night)	-	Max. 6 pcs	-
Full Spectrum Quantum Sensor	Max. 1 pc	Max. 1 pc	Up to 50 Different Sensor In Combination
Water Detectors	Max. 5 pcs	Max. 10 pcs	-
Smoke Detectors	Max. 5 pcs	Max. 10 pcs	-
MAX. Number Of Control Modules			
Temperature Device Stations	Max. 4 pcs	Max. 8 pcs	-
Humidity Stations	Max. 2 pcs	Max. 8 pcs	Up to 50 Different Control Modules In Combination
CO2 Device Stations	Max. 2 pcs	Max. 4 pcs	-
Program Device Stations	Max. 9 pcs	Max. 12 pcs	-
Internet Connectivity			
Remote Control / Monitoring	APP	APP	Web-based Program / APP
Lighting Control			
Sunrise / Sunset Lighting Control	✓	✓	✓
2 Separate Lighting Channels	✓	✓	✓
Controls Lights Using PPF / PAR meter	✓	✓	✓
Auto PPF Light Control	✓	✓	✓
DLI Monitoring	-	-	✓
4 Spectrum Control (ThinkGrow LEDs)	-	✓	✓
Group Control (10x2)(ThinkGrow LEDs)	-	✓	✓
Cloud Effect (ThinkGrow LEDs)	-	✓	✓
Climate Control			
Separate Day/Night Settings	✓	✓	✓
Controls HVAC & Mini-Split Acs	✓	✓	✓
Controls Commercial Humidifiers / Dehu	✓	✓	✓
Controls Timer Devices	✓	✓	✓
Controls Supplemental CO2	✓	✓	✓
Sub-zone Monitoring & Control	-	Monitoring Only	✓
Advanced Features			
Sunrise/Sunset Transition Settings	-	-	✓
Calendar Reminders	-	-	✓
Calendar Control - Predetermined "Recipes"	-	-	✓
Spray Mode (Temporarily Shuts Off Devices)	-	-	✓
Smoke Alarm Control	-	-	✓
Monitors Media Moisture Level	-	-	✓

Hydro-X Environmental Control System



Environmental Control System

- Complete, Professional Environmental System
- Modular Designed
- Fully Customizable
- More than 12 separate types of control "modules" to connect to devices



Two separate light control channels offer controlling two different lighting systems at the same time

LIGHTING CONTROL ADAPTERS

SENSORS

Trolmaster App offers a real-time monitoring and control from anywhere and anytime

LOW-VOLT CONTROL

HUMIDITY CONTROL

TEMP CONTROL

MULTIPLE DEVICE CONTROL

DUAL CONDITION CONTROL

TIMER CONTROL

SENSORS LINE

DEVICE LINE

LIGHTING LINE 1&2

DRY CONTACT CONTROL

EC FAN CONTROL

CO2 CONTROL

CO2

HVAC

Fan

Minisplit AC

Heater

Humidifier

Pump

Plants



Hydro-X PRO Control System

All DS modules are universal and multiple purposes in the Hydro-X Pro system
 Included products: DST-1, DST-2, DSC-1, DSP-1, DSD-1, DSH-1, DSH-2, DSV-1

Two separate light control channels offer control of two different light systems and up to almost 512 light fixtures at the same time

- Multiple sub-zones - within a single grow space
- Built-in Calendar - Presets to schedule crops recipe and reminder
- Customized Programming with graph - Construct graph to control setting on touch screen
- 50 By allowing up to 50 sensors and up to 50 separate control modules



The web-based software provides easy access and more advanced remote control options with the same upgradeable feature as the Hydro-X.

Allowing up to 50 Sensors

Allowing up to 50 devices

LIGHTING CONTROL ADAPTERS

LOW-VOLT CONTROL

DRY CONTACT CONTROL

HUMIDITY CONTROL

TEMP CONTROL

MULTIPLE DEVICE CONTROL

DUAL CONDITION CONTROL

TIMER CONTROL

SENSORS LINE

DEVICE LINE

LIGHTING LINE 1&2

THINK GROW LED Model-I PLUS

Sensors



4-in-1 Sensor (MBS-Pro)

Temperature / Humidity / Light / CO2

The MBS-PRO 4-in-1 sensor combines a precision air temperature, relative humidity, CO2 (PPM) sensor and a photocell to create the perfect all-in-one environmental sensor. It is designed to be used with the Hydro-X Pro and Hydro-X Plus controller systems.

Constructed using a new self-aspirated, water-resistant, thermoplastic enclosure, the MBS-PRO can be placed in multiple locations throughout the growing area to provide spot measurements from multiple sensors when used with the HCS-2 or HCS-3 controllers. The MBS-PRO sensors can then be used together

(averaged) or linked separately to specific device control modules in order to control a specific section (sub-zone) of the grow area. The MBS-PRO features a built-in LCD display to show the current conditions of that sensor which provide ease of on-site monitoring. It also features a new "push-lock" connection to make installation easy.

**When using multiple MBS-PRO sensors on a single HCS-2 or HCS-3 controller, the MBS-Pro requires the SPH-1 Splitter Hub for supplemental power.*

HCS-2 50

HCS-3 6



HCS-1 1

HCS-2 50

HCS-3 1

Full Spectrum Quantum Sensor (MBS-PAR)

PAR (umol) light levels

The Full Spectrum Quantum Sensor (MBS-PAR) provides the accurate and cost-effective measurement of photosynthetically active radiation (PAR) from all light sources used to grow plants. The MBS-PAR sensor module has an LCD module that will display the current light level in PPF (umol/s). When connected to the Hydro-x controllers, the user can monitor and/or actively control the light levels within their rooms by using the MBS-PAR sensor. The full-spectrum quantum sensor has a spectral range of 389 to 692 nm ± 5 nm. The improved spectral response increases the accuracy of LED measurements.

Used in conjunction with any of the HCS controllers, the PPF sensor will automatically increase or decrease the output level of your supplemental lighting systems to continuously maintain the exact lighting level (in PPF) that the user selects.



HCS-1 1

3-in-1 Sensor (MBS-TH)

Temperature / Humidity / Light

The MBS-TH sensor comes within the Hydro-X controller's (HCS-1) package. It measures the air temperature and relative humidity level within the growing area. It also allows the system to monitor the light status by using the photocell built into the sensor.

Sensors

CO2 Sensor (MBS-S8)

CO2 PPM levels

HCS-1 1



The optional CO2 Sensor (MBS-S8) measures the CO2 PPM within the growing area. Using the MBS-S8 allows the users to connect and control their supplemental CO2 system when using the Hydro-X control system.

Smoke Detector (MBS-SD)

HCS-1 5

HCS-2 50

HCS-3 10



The optional Smoke Detector (MBS-SD) can alert the user of smoke within their growing area at ALL TIMES. Up to 5 MBS-SD smoke detectors can be connected to a single Hydro-X controller. If ANY of the smoke detectors determine there is smoke in the area, the user will receive a user alert on their phone to alert them to the potential problem BEFORE the problem gets out of hand. When using the HCS-2 controller, an optional audiovisual alarm module (AS-1) can be connected for local notification of smoke within the area being monitored.

Water Detector (WD-1)

Water leak Detector

HCS-1 5

HCS-2 50

HCS-3 10



The WD-1 Water Detector can be used as a leak detector when used with any of the Hydro-X control systems. It can be used to simply monitor the floor or a specific space for the presence of water. If ANY of the water detectors determine there is water in the area, the user will receive a user alert on their phone to alert them to the potential problem BEFORE the problem gets out of hand.

Water Content Sensor (WCS-1)

Water content of the grow medium

HCS-2 50



The WCS-1 water content sensor allows the user to monitor the % of water content within the growing medium. The moisture level/water content is displayed in real-time on the WCS LCD module, the Hydro-X Pro, and the APP. That data is displayed on a graph and helps the user visualize the dry-down time, and to make adjustments to their irrigation timers & irrigation cycles.



Water Content Sensor (WCS-2)

Water content of the grow medium

HCS-2 50

The WCS-2 Water Content Sensor provides the users with an accurate and simple way to monitor your grow medium. The WCS-2 consists of a multi-prong sensor assembly that is inserted into your grow medium. Once the WCS-2 is calibrated to your grow medium and your nutrients, you will get constant readings from the WCS-2 providing the actual water content within the grow medium, the temperature of the grow medium and also the EC within the grow medium. You can even select alarm "limits" for each variable monitored by the WCS-2 to send remote notifications through the TrolMaster or TM+ apps. The moisture level, EC and the grow medium temperature are displayed in real-time on the WCS LCD module, the Hydro-X Pro and on the APP. That data is displayed on a graph and helps the user visualize the dry-down time, and to make adjustments to their irrigation timers & irrigation cycles.

Lighting Control Adapters

The Hydro-X system can control most lighting systems that offer a "low-volt" control option. The LMA adapters allow the Hydro-X system's main controller to be used with many brands of HID, CMH, and LEDs to control the dimming and On/Off functions. Certain light manufacturers use a special communication protocol that requires one of the following LMA in order to control these lights.

Lighting Adapter F (LMA-14)

For lights with 0-10V protocol control
*Most commonly used



Lighting Adapter T (LMA-T)

Specially designed for ThinkGrow LEDs
*For ThinkGrow ONLY



Group Control Lighting Adaptor (LMA-G)



Specially designed to be used with the ThinkGrow single-bar LEDs i.e. Model-I and I Plus



10 Group Control / Spectrum Group Control channels available



Lighting Adapter P (LMA-11)

For Phantom ballast



Lighting Adapter D (LMA-12)

For Dimlux ballast



Lighting Adapter S (LMA-13)

For Sun Systems ballast



Lighting Adapter DLI (LMA-15)

For DLI ballast



Lantern Schedule Adapter (LMA-24)

For lights with 0-10v protocol control



Temperature Control Modules

HCS-1	4
HCS-2	50
HCS-3	8

Temperature Device Station (DST-1 & DST-2)

Rated @10-amps

The TrolMaster DST-1 & DST-2 temperature control modules allow the user to easily connect and control standard heating or cooling devices to the Hydro-X controllers. Any heating or cooling device that is 10-amps @ 120/240-volt or less can be controlled by the DST-1/2.

DST-1
120 Volt Power (Nema 5-15)

DST-2
240 Volt Power (Nema 6-15)

HCS-1	4
HCS-2	50
HCS-3	8

AC Remote Station (ARS-1)

Mini-split AC Controller
*Compatible with MOST brands of mini splits

TS-1
4 wire HVAC Thermostat (cool only)

TS-2
6 wire HVAC Thermostat (heat + cool, heat pump & 2-stage)

Thermostat Station (TS-1 & TS-2)

The TS-1 and TS-2 Thermostat Stations are designed to replace a thermostat connected to a standard HVAC unit. The TS-1 and TS-2 are wired to the HVAC system using the same low-voltage thermostat cable and have the standard color-coded wiring as most thermostats. The Hydro-X controllers allow separate Day and Night settings for each of the connected TS modules, so multiple HVAC systems can be controlled by a single Hydro-X control system. This also provides the ability to set slightly different temperature settings for each TS module and HVAC unit, to provide multiple "stages" of heating or cooling control.

The ARS-1 mini-split air conditioner controller is a unique product that solves the age-old problem of having separate day and night temperature settings on your mini-split air conditioners. The ARS-1 is a universal controller that works with most mini-split air conditioners (and some window-type AC units too), as long as the unit comes with an IR / infrared remote controller. We use the remote controller that came with the AC unit to "teach" those IR signals to the ARS-1 module. Once the ARS-1 "learns" those remote control codes, the ARS-1 will send those same signals to the indoor mini-split head unit changing the set point to the desired Day or Night temperature setting automatically based on the photocell sensor status on the controller's sensor.

Humidity Control Modules



DSH-1
120 Volt Power (Nema 5-15)



DSH-2
240 Volt Power (Nema 6-15)

- HCS-1 2
- HCS-2 50
- HCS-3 8

Humidity Device Station (DSH-1 & DSH-2)

The TrolMaster DSH-1 & DSH-2 humidity control/device modules allow the user to easily connect and control standard humidification or dehumidification devices to the Hydro-X controllers.

**To be used with dehumidifiers less than 7-amps to avoid overcurrent.*

Commercial Dehumidifier Humidistat (HS-1)

Dehumidifier Humidistat



- HCS-1 2
- HCS-2 50
- HCS-3 8

The HS-1 from TrolMaster is used to control commercial dehumidifiers. Most larger/commercial dehumidifiers have a "low-volt" control option so the dehumidifier can be controlled by an external humidistat. The HS-1 works and is wired exactly like an external humidistat. The HS-1 is the best way to control your commercial dehumidifiers by eliminating the need to control the high-amperage / inrush current associated with dehumidifiers upon startup.

Program Timer Modules



DSP-1
120 Volt Power (Nema 5-15)



DSP-2
240 Volt Power (Nema 6-15)

Program Device Station (DSP-1 & DSP-2)

Lights / Fans / Pumps / Exhaust Fan
Rated @10-amps

The TrolMaster DSP-1 & DSP-2 program device module (Timer Module) works like a multi-function timer. It is a plug-in style control module that will allow the user to easily connect any device that needs to be controlled by TIME to the Hydro-X controllers.

- HCS-1 9
- HCS-2 50
- HCS-3 12

CO2 Control Module



CO2 Device Station (DSC-1)

120 Volt Power (Nema 5-15)
Rated @10-amps

The TrolMaster DSC-1 CO2 control / device module allows users to easily connect and control standard supplemental CO2 devices or CO2 exhaust controls to the Hydro-X systems. Users can configure the DSC-1 to increase or decrease the CO2 level within their grow area.

- HCS-1 2
- HCS-2 50
- HCS-3 4

Dry Contact Modules

Dry Contact Station (DSD-1)

Rated @30VDC/250VAC up to 6-amps



The TrolMaster DSD-1 Dry-contact module provides a simple and flexible solution to users who want to connect & control devices to the Hydro-X system using a "dry-contact" or relay to activate the device. Some equipment requires either normally open or normally closed contact closure in order to activate the equipment. The DSD-1 is the product that you need to control those types of devices. The DSD-1 can be configured to work as the other plug-in style of TrolMaster power modules work.

The DSD-1 connects to the "Devices" line on the Hydro-X controllers and can be set to control an almost infinite number and types of devices. Such as lighting contactors, light deprivation curtains, pump contactors, temperature devices, humidity devices or CO2 devices.

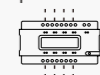


Dry Contact Board (OM-8)

Rated @30VDC/250VAC up to 12-amps



For Hydro-X Pro (HCS-2)



Counts as 8 Dry-contact modules in combination

The OM-8 dry contact board allows for each output activated. That minimizes high start-up (inrush current) when multiple devices are activated at the same time.

*The OM-8 is suggested to be mounted inside an electric control cabinet, and connected to a power supply between 100-240 VAC.

Low-volt Control Module



Low-volt Station (DSV-1)

Rated @12/24 VDC @ 0.5-amps or 12/24 VAC @ 4.8 VA

The TrolMaster DSV-1 is a low-voltage output module that can be used on the Hydro-X controllers. The DSV-1 can be addressed to be used as a temperature, humidity, CO₂, or program device module. Multiple voltage outputs on the

DSV-1 are selectable by the user. The DSV-1 can output either 12 or 24 VDC up to 0.5-amps, or 12 or 24 VAC up to 4.8VA. Once the module is configured, it will activate the low-volt device wired to the DSV-1.

Dual Condition Control Module



Dual Condition Adapter (DCC-1)

For HCS-1 and HCS-3 controllers

The TrolMaster DCC-1 provides a simple solution to control a single device with more than one condition. For example, it allows the user that would like to turn on their exhaust fans when either temperature or humidity is too high; to shut off CO₂ when turning on the exhaust fan. The DCC-1 can be used in different two conditions scenarios that can be applied either combined or split.

The DCC-1 is designed to be used in combination with one of the TrolMaster plug-in-style modules (DS modules). Once connected to the DS module using the RJ12 cable built into the DCC-1, the DCC-1 will act in concert with that DS module to control whatever device is connected to the DS module. The DCC-1 can also be set to work in two distinct ways using the "Interlock" function.

**The DCC-1 is not needed on the HCS-2 controller because the HCS-2 has internal dual-condition functions.*

Multiple Device Control



Expander Station 4 (4RS-1)

Rated @120/240 volts, up to 50-amps total / 20-amps per power outlet

The 4RS-1 is a universal 4-outlet power expansion module. It can be used with any of TrolMaster's "plug-in" style device modules to expand the number of devices that can be controlled by the Hydro-X. A single 120-240 volt "trigger" cable on the 4RS-1 connects to your device/control module. When the device module is activated by the Hydro-X, the 4RS-1 trigger cable will turn on each of the 4 universal 120/240V receptacles on the 4RS-1 with a 3-second time delay between each outlet being activated. That minimizes high start-up (inrush current) and allows up to 4 devices to be safely controlled. The 4RS-1 must be installed with a 120/240-volt power circuit (up to 50-amps @ 240vac). Three wire terminals inside the unit accept up to #6 AWG wire making connections to the power source easy.

Multiple Device Control



Temperature / Humidity Station (TSH-1)

The TrolMaster TSH-1 Temperature/ Humidity Station is a 0-10 volt analog output control station that works with the HCS-1, HCS-2 and HCS-3 controllers. The TSH-1 can be configured to control either a temperature or a humidity device that requires a variable 0-10 volt input signal.

The TSH-1 is capable of controlling variable speed fans, vents or any other device that accepts a 0-10 volt input. It features separate day and night "idle" speed settings and maximum speed settings built into the TSH-1 as well as separate Day / Night set points accessed through any of the Hydro-X / HCS controllers.

Industrial Fan Control



Only For
HCS-2

Industrial Fans Inverters Control Station (VFD-1)

Industrial Fan / Inverter / Control Station

The TrolMaster VFD-1 Variable Frequency Drive is specifically designed to control VFD Inverters including the TECO E510, DELTA ME300, ABB ACS355 (with an FMBA-01 module). When used with the Hydro-X Pro controller, the user can precisely control the power and speed of multiple industrial 3-phase fans within the growing area.

Industrial Fans Inverters (DELTA-1)

Industrial Fan / Inverter

Use with
VFD-1



The TrolMaster's Delta-1 is a customized made variable-frequency drive (VFD) by Delta company. It can be used with the TrolMaster Hydro-X Pro system to control the speed of 3-phase AC fan motors, (industrial fans etc). Up to 5HP motors can be operated by the Delta-1, or multiple smaller motors can be connected to a single Delta-1. (Ask TrolMaster for details) A RJ45 cable is included for connecting the Delta-1 VFD drive to the TrolMaster VFD-1 module. This customized version of the Delta VFD drive has had all the parameters preset and ready to be operated with the VFD-1 module straight out of the box.

Grow Camera

TrolMaster Grow Camera (TC-1)



940nm Invisible IR Illuminator



Heavy Duty IP66 Rated



Specially Designed for Plants

The TrolMaster Grow Camera (TC-1) is a high-quality surveillance camera specially designed for grow rooms and can be linked to any of the Hydro-X controllers. The invisible IR light ranges from 700nm to 1mm. Most security cameras use night-vision IR illuminators with 700-850nm wavelength that can negatively affect a plant's photoperiod. TrolMaster Grow Camera's built-in night vision

has been engineered to use invisible IR illuminators with a 940nm wavelength to prevent disrupting the morphology of the plant during the dark period. It is fully compatible with TrolMaster Apps TM+ to provide easy visual monitoring for your grow area 24-7. Using the TC-1 and the TM+ app provides 3 megapixels of low latency internet live footage. A built-in Micro-SD card slot is also available for video recording.



Audible and Visible Alarm

Alarm Station 5 (AS-5)



The AS-5 audiovisual alarm module can be connected to the (HCS-2 or HCS-3), so that if the controller detects any alarm conditions, the AS-5 will immediately alert the user. The user can then acknowledge the alarm and silence it directly on the controller touchscreen.

Connection

RJ12 Splitter Hub (SPH-1)



The RJ12 Splitter Hub (SPH-1) has been designed to connect up to 8 sensors or device modules together to provide a super-clean and effective wiring alternative to the provided RJ12 Y-splitters. The SPH-1 uses a single RJ12 cable input jack and provides 8 individual RJ12 output jacks that can be connected to various TrolMaster sensors, adapters and device modules.

The SPH-1 is also a powered hub, meaning that it will boost the signals passing through the SPH-1 allowing more modules, sensors and light adapters to be connected to the TrolMaster controllers. By using the SPH-1, an almost unlimited number of LED/HID lights can be controlled using a single TrolMaster controller.

Connection

Only For
HCS-2

TrolMaster Wireless Station (TWS-1)

The TWS-1 Wireless Station enables you to use TrolMaster sensors and devices wirelessly with your existing Hydro-X Pro Controller (HCS-2). The TWS-1 is designed to convert wired and wireless protocols, thus building a scalable, solid communication link between the

HCS-2 controller, sensors, and devices. The TWS-1 provides a wiring-free option for TrolMaster's future wireless product development, to enhance user experiences by offering the option to connect sensors and devices wirelessly.



RJ12 to RJ12



RJ12 25' Coiled Communication Cable (ECS-10)

The ECS-10 is a 25' coiled RJ12 communication cable. It comes with a 15' coiled cable with 5' straight cables on each end. When connecting fixtures that are installed on a lifting system or movable vertical racking, you can use the RJ12 coiled communication cable ECS-10 to allow the fixtures to be mobile and to be moved freely.

RJ12 to RJ12

500ft RJ12 Cable Roll (ECS-500)

Comes with TrolMaster 500ft RJ12 cable roll x1, RJ12 crystal heads x100, crystal head protectors x100



Most sensors and control modules are connected by using standard RJ12 cable and splitters, making installation as simple as plug-and-play. TrolMaster provides the ECS-500 cable roll package for users to customize their own cables when the standard cables provided are not satisfying their needs.

Connection

RJ12 to RJ12

RJ12 Extension Cable Set (ECS-1)

Comes with a 16ft(4.88 m) cable x1, 4ft (1.22 m) cable x1, Y-splitter x1



TrolMaster modules and sensors all come complete with a RJ12 16ft cable, Y-splitter and RJ12 4ft cable to connect to the Hydro-X system main controller. When connecting modules that are farther apart, you can use the ECS-1 cable extension kit to extend the length of your pre-made RJ12 cables.

RJ12 to Threaded Connector



RJ12 to Threaded Waterproof Connector Converter Cable (ECS-3)

Comes with a 4ft (1.22 m) RJ12 to Pigtail cable x 1, 16ft (4.88 m) RJ12 cable x1, Y-splitter x 1

The ECS-3 provides a 5/8" diameter connector for some Fluence brands LED fixtures using Threaded Waterproof Connectors for interconnecting. Like the other ECS kits, the ECS-3 comes with a 16ft RJ12 cable, a Y-splitter and a special 4ft RJ12/Threaded Waterproof Connector cable.

IR Emitter Extension Cable

32ft Extension Cable for IR Emitter on ARS-1/Beta-1 (ECS-8)

Comes with 32ft (9.75 m) ECS-8 32ft Extension cable x1

The ECS-8 extension cable is simply a 32 ft extension cable to use with the IR emitter on the AC Remote station ARS-1 and Digital Day / Night Remote Controller Beta-1. It has a male and female 3.5mm end and can extend the distance between the IR emitter and AC Remote station ARS-1 and Digital Day / Night Remote Controller Beta-1.



RJ12 to Pigtail connection

RJ12 to Pigtail Connection Cable Set (ECS-2)

Comes with a 4ft (1.22 m) RJ12 to Pigtail cable x 1, 16ft (4.88 m) RJ12 cable x1, Y-splitter x 1



The ECS-2 cable set is designed to connect the Hydro-X controller's Light control ports to most LED drivers with Pigtail wiring. The special cable connects to your lighting fixture/LED driver using the two-screw terminal block to connect to loose wires on the LED driver. Simply connect the two wires from your LED driver to the terminal block, each of the lights being controlled is wired in a "daisy-chain" configuration back to the Hydro-X LMA adapter.

**You will still need one of the LMA-14 light adapters connected between the ECS-2 and the Hydro-X controller.*

RJ12 to M16

RJ12 to Push Lock Waterproof Connector Converter Cable (ECS-5)

Comes with 4ft (1.22 m) RJ12 to Push Lock waterproof connector converter cable x1, 16ft RJ12 cable x1, Y-splitter x 1



The ECS-5 provides a 5/8" diameter connector for some Fluence brand newer LED fixtures using Push Lock Waterproof Connectors for interconnecting. Like the other ECS kits, the ECS-5 comes with a 16ft RJ12 cable, a Y-splitter and a special 4ft RJ12/Push Lock Waterproof Connector cable.

Connection

RJ12 to 4-pin connector

12ft RJ12 to 4-pin IP65 connector cable (ECS-9)

Comes with 12ft (3.66 m) RJ12 to 4-pin IP65 connector cable x1



The ECS-9 RJ12 to 4pin connector cable is simply a 12 ft cable to use with Lighting Control Adapter T (LMA-T) and ThinkGrow LEDs with Threaded Waterproof Connectors for interconnecting.

**Each LMA-T comes with a ECS-9 cable. Additional cables can be purchased separately to allow customer cable configurations.*

TrolMaster Sensor Bracket (TSB-1)



The TSB-1 TrolMaster Sensor Bracket is an optional wall mount bracket specially designed for the MBS-K30 & MBS-PRO sensors. Users can attach their MBS PRO or MBS K30 sensor on the wall, instead of allowing it to hang freely.

Weatherproof Box (BM-1)

The BM-1 weatherproof box is designed to protect the TrolMaster TS-1/2, HS-1 and ARS-1 controllers from water and low-pressure sprayed water inside the growing area.

RJ12 Extension Coupler

RJ12 Waterproof Straight-Through Inline Coupler (ECW-1)

Comes with RJ12 waterproof straight-through inline coupler x2



The TrolMaster ECW-1 RJ12 Waterproof Straight-Through Inline Coupler (2-Pack) is designed to extend the connection between two RJ12 cables such as one of the TrolMaster sensors and a RJ12 extension cable. Its sealed waterproof connectors prevent water intrusion, thus maintaining a long-lasting and stable connection with high performance between the controller, sensors and devices.

Multifunction Crimper (MC-1)



TrolMaster MC-1 Multifunction Crimper and Cable Tester is a premium-quality, all-in-one crimping tool, network cable tester, wire stripper and cutter. Network professionals can easily terminate and test network cables for wiring continuity, open configurations, shorts and other wiring defects within their cables. Excellent addition to any network toolbox, this crimping tool and cable tester can quickly check terminations before IT staff install the customized cable. It also allows for quick identification and repair of connection problems in an existing installation.



Alerts and Remote Control: APP Web-based

Main Controller

Aqua-X Controller (NFS-1)

Level 1



Complete Irrigation Control System	12 Individual customized daily irrigation schedules	Control up to 30 separate Zones individually
Monitor up to 8 Water Content Sensors	Historical Chart	Compatible with the free TrolMaster App

The Aqua-X (NFS-1) is a rugged and reliable irrigation control system. It is a **fully customizable and modular system** that is easy to install and expand. It can control up to 30 separate irrigation zones (24vac solenoid valves or 120vac pumps). The Aqua-X not only monitors the pH/EC and water temperature of your nutrients, but it can also monitor the actual growing medium moisture levels EC and temperature by using up to 8 Water Content Sensors connected to a single Aqua-X controller. The irrigation timers can be set to work as **recycling timers** or to operate at a specific time of day and duration. With the free TrolMaster App, users can access all settings and alerts on the NFS-1 system anywhere, anytime.

Control:
(with Aqua-X System)

Device modules like the OA6-110, OA6-24, and DSP-1&2 allow the Aqua-X to control devices like pumps and valves with 110/240 V and 24V control.

OA6-110 110 / 240V

Small 110V
Pumps / Valves (<1.5A)

OA6-24 24V

24 VAC devices
e.g. solenoid valves/pumps (< 0.2A)

DSP-1 / 2

Any device up to 10 amps
* at 120V or less for DSP-1
* at 240V or less for DSP-2

The OA6 series both have 6 separately controlled outlets, each with individual time setting.

Each NFS-1 allows up to 5 control modules to be connected. A maximum of 30 devices can be controlled (e.g. Solenoid Valves and Pumps), when using the OA6 series of control modules.

Our exclusive Master Pump Link allows the user to automatically control a central pump if used with the OA6-24 control module. When any of the 24 volt solenoids are activated, the pump will automatically operate eliminating the need to coordinate two separate timers for the pump and solenoids.

*NOTE *An OA6-24 connected with a DSP module using the master pump link function will only be counted as 1 control module.*

Examples of Possible Combinations (5 modules in total) :

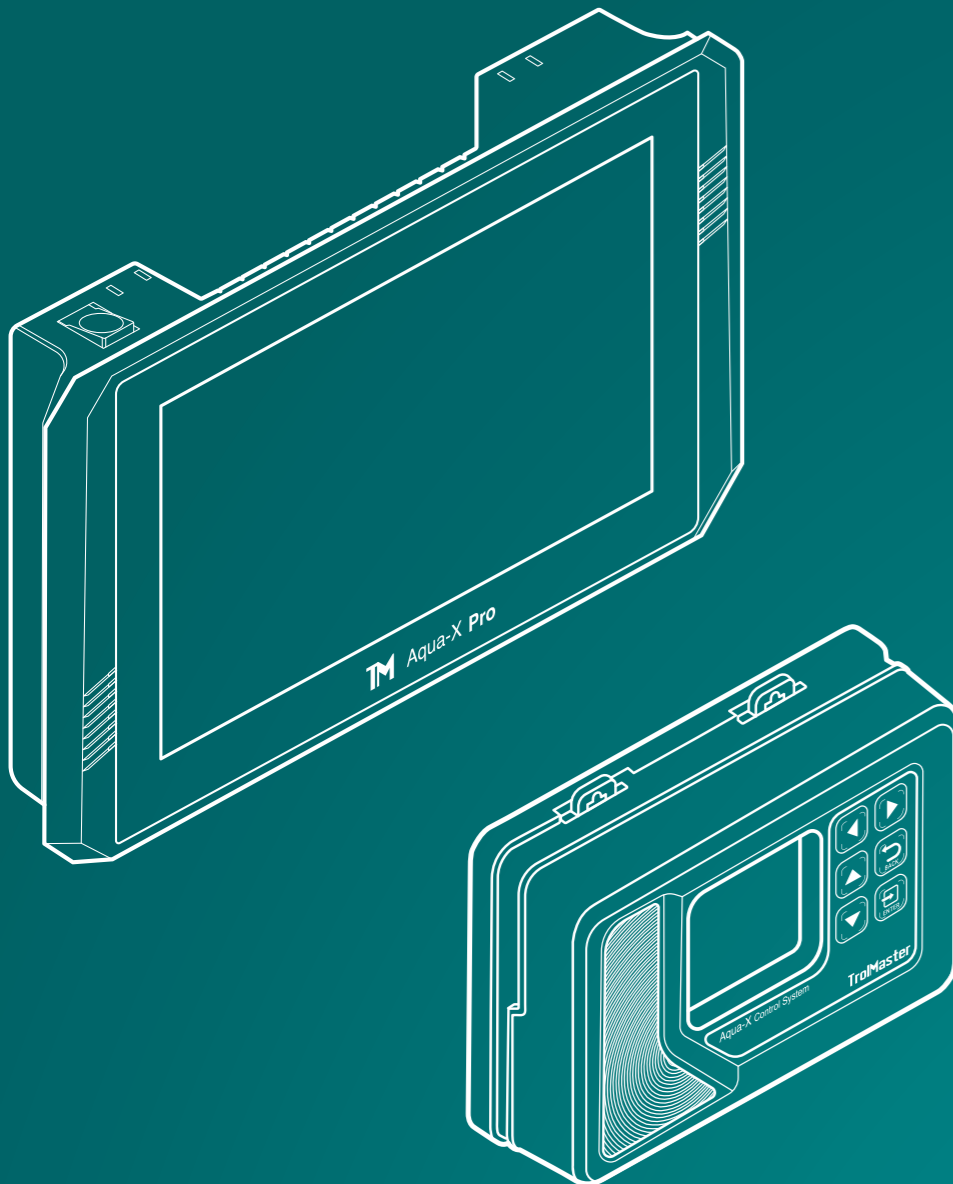
OA6-110 x 3
OA6-24 x 1
DSP module x 1

or

OA6-110 x 1
DSP module x 2
OA6-24 (+DSP module) x 2
master pump link

or

OA6-110 x 1
DSP module x 4



What is the Aqua-X System?

Fertigation & Irrigation control in modern commercial horticulture is more than just the process of applying controlled amounts of water to grow crops. To be successful, growers must also constantly monitor their grow medium and the condition of the nutrient solution that is being fed to the plants. The Aqua-X system is a professional-grade irrigation system, which provides 24/7 monitoring of those critical variables, and will control multiple schedules for irrigation. Its modular design provides complete customization and flexible expansion to best suit each grower's needs. There are 2 main controllers available: Aqua-X (NFS-1) and Aqua-X Pro (NFS-2). By offering two different controllers each with its own mixtures of available functions and features, users can select the right one based on their needs.

Aqua-X System Overview Video



Main Controller

Alerts and Remote Control: APP Web-based

Aqua-X Pro Controller (NFS-2)

Level 3



Professional Irrigation Control System	50 Individual customized daily irrigation schedules	Control up to 600 separate Zones individually	Monitor up to 50 sensors (pH/EC, Water Content & Water Flow)
10.1" LED Touchscreen	Advanced features designed for Aqua-X Pro (NFS-2)	Historical Chart	Remote access by using the free APP & web-based console

The Aqua-X Pro (NFS-2) is a **multi-functional "PRO" Level** fertigation controller. It can control literally hundreds of irrigation solenoids and pumps, as well as monitor multiple water sensors that can measure pH, EC / PPM, temperature, water flow and water content. Up to **50 sensors** can be connected to a single NFS-2 controller. The NFS-2 allows the user to easily collect and review historical data of all of the measured parameters available on the NFS-2.

With the NFS-2 you have the ability to customize all of the irrigation cycles including **unlimited timer schedules** and the ability to link pumps and solenoids to work in tandem. But where it really sets itself apart is when you utilize the new and advanced features created just for the NFS-2.

With the Aqua-X Pro Controller, YOU decide!

There are several new sensors and modules which will unlock some amazing new and advanced features on the NFS-2.

Feed by Volume function with DFM-1/2/3	Feed on Demand function with WCS-1/2	Water Tank Auto-filling function with WD-1	Built-in Calendar Control function
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Feed by Volume: (with DFM-1 / 2 / 3)

By using one of our DFM digital flow gauges you will be able to control the amount of water you want to feed the plants by entering gallons or liters directly. No more guesswork or math to determine how long to activate your solenoids and pumps.

Feed on Demand: (with WCS-1 / 2)

The WCS-1 or WCS-2 water content sensor allows the user to automatically monitor the moisture level of your grow medium, and initiate irrigation cycles "on demand" when the plants need more water.

Water Tank Auto-filling: (with WD-1)

The Auto-fill function on the Aqua-X Pro uses 2 water detectors which will be installed in your nutrient tank. One water detector will be positioned at the bottom of the tank and one at the top of the tank. When the liquid level drops below the bottom sensor, the Aqua-X Pro will activate a solenoid, or pump and the tank will fill back up to the sensor at the top.

Calendar Control:

TrolMaster has also made your job easier by allowing the user to build and schedule their entire crop's fertigation recipe with the NFS-2's built-in Calendar function on the Aqua-X Pro. Create a custom-built multi-week crop schedule that will automatically initiate your pre-set changes in a matter of minutes, and you can be worry-free for the rest of the growing period. Reminders can also be programmed to ensure critical tasks are never forgotten.

Aqua-X Controllers Comparison



Aqua-X (NFS-1)



Aqua-X PRO (NFS-2)

Quick Look

Size	Backlit 128 x 128 LCD Display	10.1" LCD Screen
Control	Button Control	Touchscreen
Save / Copy / Import / Export Data	Micro-SD	USB
Firmware Update	Micro-SD	USB / Online
Package Content	Aqua-X Controller x 1 Water Detector Sensor x 1 Touch Spot x 1 Mounting Plate x 1	Aqua-X Pro Controller x 1 AMP-3 Sensor Board x 1 RJ12 Cable Set x 1 Mounting Plate x 1

Product Capacity

MAX. Number Of Water Sensors

Sensor Board (Module to connect the Aqua-X & Water Sensor)	Max. 1 pc (AMP-2)	Up to 50 Sensor Board (AMP-3) & Water Detectors in Combination
PPH-1/2/3 (Water pH Sensor)	Max. 1 pc	
PCT-1/2/3 (Water EC & Temp Sensor)	Max. 1 pc	

MAX. Number Of Water Detector

WD-1/2 (Water Detectors)	Max. 25 pcs	Up to 50 Control Modules in Combination In Each Pumps & Valves Channels (Up to 600 pumps + Valves in total)
WCS-1/2 (Water Content Sensors)	Max. 8 pcs	
DFM-1/2/3 (Digital Flow Meter)	-	

MAX. Number Of Control Modules in Combination

OA6-24 (24V - 6 outputs)	Up to 5 pcs in Combination Up to 30 individual schedule outputs	Up to 50 Control Modules in Combination In Each Pumps & Valves Channels (Up to 600 pumps + Valves in total)
DSV-1 (12-24V AC/DC)		
OA6-110 (120V@1.5A x 6 outputs)		
DSP-1/2 (120/240V @ 10amps)		
DSD-1 (Dry-contact 250VAC/30VDC @ 6 amps)		
OM-8 (8x Dry-contact 250VAC/30VDC @ 12 amps)	-	

Internet Connectivity

Remote Control / Monitoring	App	Web-based Program / App
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Irrigation Control

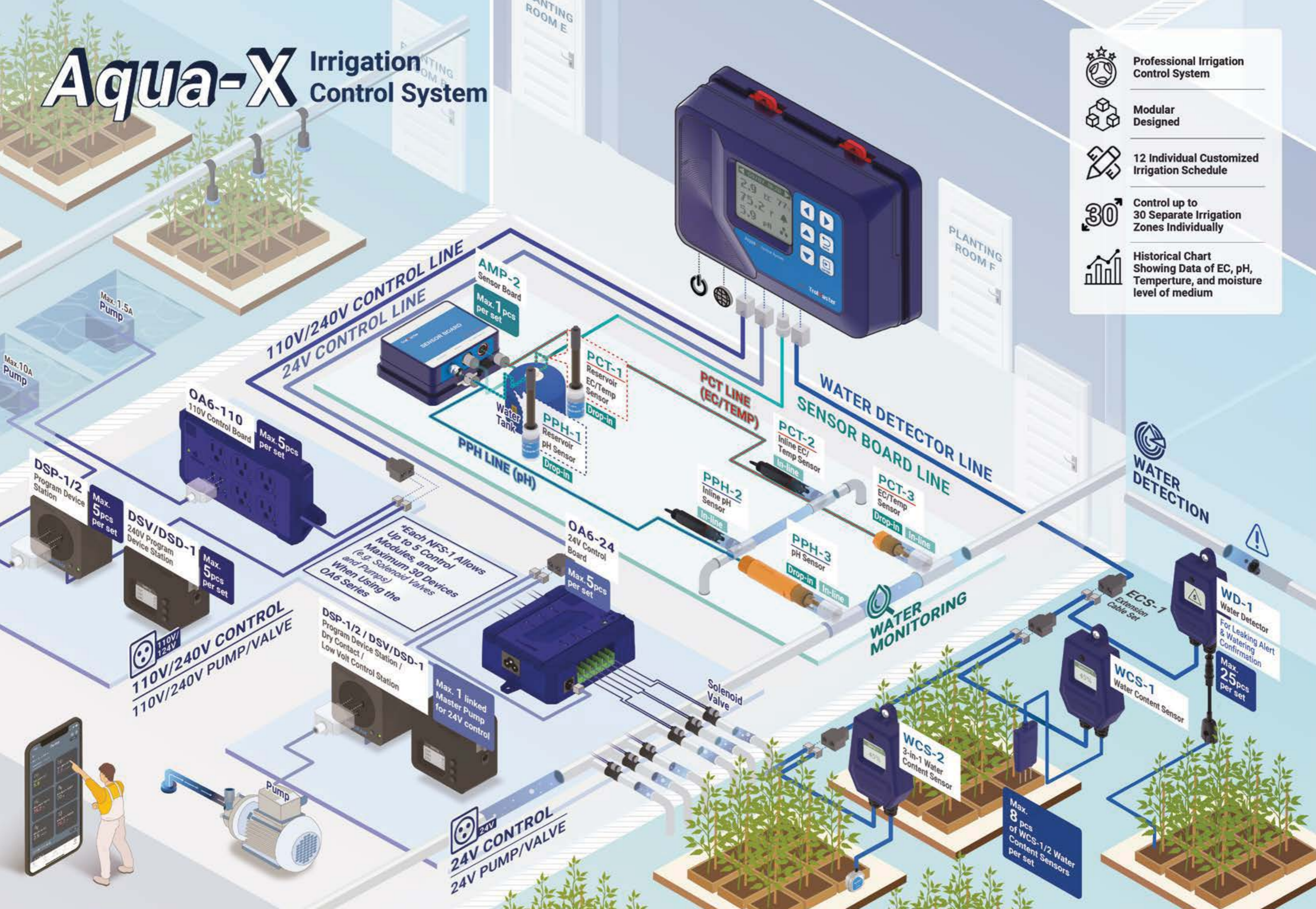
Water EC & pH & Temp Monitoring	✓	✓
Medium EC & Temp Monitoring	✓	✓
Medium Moisture Level Monitoring	✓	✓
Watering Confirmation Monitoring	✓	-
Leaking Detection	✓	✓
Recycle Timer	✓	✓
Individual Time Schedules	12 schedules Per Day	Up to 50 Schedules Per Day
Linked Master Pump	Max. 1 pc	Max. 300 pcs

Advanced Features

Multiple room/zone Control & Monitoring	-	✓
Feed by Volume (with DFM-1/2)	-	✓
Liquid Volume Monitoring	-	✓
Feed On Demand (with WCS-1/2)	-	✓
Automatically Fill Water Tanks	-	✓
Calendar Reminders	-	✓
Calendar Control - Predetermined "Recipes"	-	✓

Aqua-X Irrigation Control System

-  Professional Irrigation Control System
-  Modular Designed
-  12 Individual Customized Irrigation Schedule
-  30 Control up to 30 Separate Irrigation Zones Individually
-  Historical Chart Showing Data of EC, pH, Temperature, and moisture level of medium



Aqua-X PRO Irrigation Control System

-  Feed by Volume with DFM-1/2/3
-  Feed on demand With WCS-1/2
-  Water Tank Auto Fill
-  Calendar Control with Predetermined Recipes
-  Up to 50 Individual Customized Irrigation Schedule per Day
-  Multi-zone Monitoring



PUMP LINE

MEDIUM LINE

NUTRIENT LINE

VALVES LINE

NUTRIENT MONITORING

MEDIUM DETECTION

OA6-110
110V Control Board
Up to 50 Control Modules in Each Pump and Valves Channels
Max 300 outputs in each channel

OA6-24
24V Control Board
Control Up to 6 24-vac Solenoid Valves

DSP-1/2
Program Device Station
Control Small 110V Pump or Solenoid Valves (less than 1.5 amps)

DSP-1/2
240V Program Device Station
Control Up to 6 240V Solenoid Valves

DSV-1
Program Device Station
Control Up to 8 Multiple Master Pumps that can be Linked to Solenoid Valve

DSD-1
240V Program Device Station
Control Up to 8 Multiple Master Pumps that can be Linked to Solenoid Valve

OM-8
Dry Contact Board
Control Up to 8 Multiple Master Pumps that can be Linked to Solenoid Valve

SPH-1
Splitter Hub

PPH-1
Reservoir pH Sensor
Drop-in

PCT-1
Reservoir EC/Temp Sensor
Drop-in

PCT-2
EC/Temp Sensor
In-line

PPH-2
pH Sensor
In-line

PCT-3
EC/Temp Sensor
Drop-in

PPH-3
pH Sensor
Drop-in

DFM-1
1" Digital Flow Meter

DFM-2
1.25" Digital Flow Meter

WCS-2
3-in-1 Water Content Sensor
For monitoring the water content % temp and EC

WCS-1
Water Content Sensor

WD-1/2
Water Detector
For Auto-Filling

WD-1/2
Water Detector
For Auto-Filling

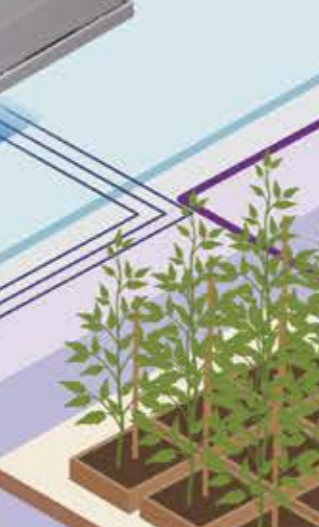
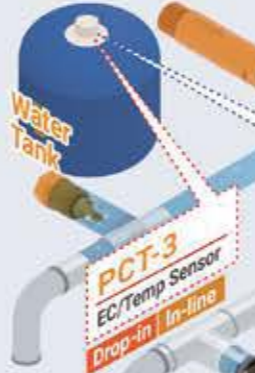
SPH-1
Splitter Hub

AMP-3
Sensor Board

AMP-3
Sensor Board

AMP-3
Sensor Board

Up to 50 Sensors and Detectors in Combination



Sensor Board

Sensor Board (AMP-2)

NFS-1
Max. 1 pcs



The AMP-2 Sensor Board connects the Aqua-X controller (NFS-1) to a set of precision pH/EC & temperature probes to constantly measure the pH/EC & temperature of the water being sampled. The AMP-2 works with the TrolMaster PCT-1/2/3 and the PPH-1/2/3 probes. Once connected to the Aqua-X, the AMP-2 will display the sensor data on the Aqua-X and on the TrolMaster APP. The minimum and maximum "limits" can be set on the Aqua-X providing 24/7 remote notification if the pH/EC or temperatures are out of limits.

pH Sensors

Reservoir pH Probe (PPH-1)

Use with
AMP-2/3



The TrolMaster PPH-1 pH probe is a standard drop-in tank style of probe that provides accurate and reliable monitoring of the pH of the water being monitored by the Aqua-X and Aqua-X Pro. The PPH-1 probe can be connected to the Aqua-X through the AMP-2 or to the Aqua-X Pro through the AMP-3.

Inline pH Probe (PPH-2)

Use with
AMP-2/3



The TrolMaster PPH-2 pH probe is an inline 3/4" probe that provides accurate and reliable monitoring of the pH of the water being monitored by the Aqua-X and Aqua-X Pro. The PPH-2 probe is a commercially rated

inline probe and it connects to the Aqua-X through the AMP-2 or to the Aqua-X Pro through the AMP-3. It is intended to be used inline with existing PVC piping and also can be placed into a water tank.

Sensor Board for Aqua-X Pro only (AMP-3)

The AMP-3 Sensor Board is used as a bridge between the sensors (pH sensor & EC/Temp sensor) and the Aqua-X Pro controller. It is specially designed for the Aqua-X Pro system. It can be connected to the main controller with a standard RJ12 cable. Multiple AMP-3 units can be

connected to one system to be able to monitor multiple stock tanks, or inline nutrient dosing systems. The pH level, EC level and water temperature will be displayed on its LCD screen and the Aqua-X Pro master controller screen.



NFS-2
Max. 50 pcs
in combination

pH Sensors



Use with
AMP-2/3

Drop-in / inline Heavy Duty Nutrient pH Sensor (PPH-3)

The TrolMaster PPH-3 pH probe is a commercially rated 3/4" inline probe that provides accurate and reliable monitoring of the pH of the water being monitored by the Aqua-X systems. The TrolMaster PPH-3 pH probe is a commercially rated 3/4"

inline probe that provides accurate and reliable monitoring of the pH of the water being monitored by the Aqua-X systems. It is intended to be used inline with existing PVC piping and also can be placed into a water tank.

EC / Temp Sensors



Use with
AMP-2/3

Reservoir EC & Temp Probe (PCT-1)

The TrolMaster PCT-1 EC & Temperature probe is a standard drop-in tank style of probe that provides accurate and reliable monitoring of the EC and temperature of the water being monitored by the Aqua-X and Aqua-X Pro. The PCT-1 probe can be connected to the Aqua-X through the AMP-2 or the Aqua-X Pro through the AMP-3.



Use with
AMP-2/3

Inline EC & Temp Probe (PCT-2)

The TrolMaster PCT-2 EC & Temperature Probe is an inline 3/4" probe that provides accurate and reliable monitoring of the EC and temperature of the water being monitored by the Aqua-X system. The PCT-2 probe is a commercially rated inline probe which

can be connected to the Aqua-X through the AMP-2 or the Aqua-X Pro through AMP-3. It is intended to be used inline with existing PVC piping and also can be placed into and water tank.



Use with
AMP-2/3

Drop-in / inline Heavy Duty Nutrient EC / Temp Sensor (PCT-3)

The TrolMaster PCT-3 EC & Temperature probe is a commercially rated 3/4" inline probe that provides accurate and reliable monitoring of the EC & temperature of the water being monitored by the Aqua-X systems. It is

intended to be used inline with existing PVC piping. The new short body design also provides easier installation using standard PVC fittings and provides an option for run-off monitoring.

Digital Flow Meters



DFM-1
1" Digital Flow Meter



DFM-2
1.25" Digital Flow Meter



DFM-3
1.5" Digital Flow Meter

Digital Flow Meter (DFM-1 & DFM-2 & DFM-3)

The DFM-1/2/3 is a digital inline flow meter, specially designed for the Aqua-X Pro (NFS-2). It will accurately measure and display liquid flow rate, and the total amount of water. It can be easily connected to the NFS-2 by using an RJ12 cable. Once installed users can activate the powerful advanced feature called "Feed By Volume", which allows the DFM-1/2/3 to measure and control the desired volume of nutrient solution to be used.

NFS-2

Max. 50 pcs
in combination

Medium Monitoring



3-in-1 Water Content Sensor (WCS-2)

Monitoring your grow medium for proper water content % and EC is an important factor in high-yield growing applications. TrolMaster understands that today's method of "crop steering" involves more precise control of the amount of nutrients and the nutrient strength within the grow medium in order to achieve the best results. The WCS-2 Water Content Sensor provides the users with an accurate and simple way to monitor your grow medium.

The WCS-2 consists of a multi-prong sensor assembly that is inserted into your grow medium. Once the WCS-2 is calibrated to your grow medium and your nutrients, you will get constant readings from the WCS-2 providing the actual water content within the grow medium, the temperature of the grow medium and also the EC within the grow medium. You can even select alarm "limits" for each variable being monitored by the WCS-2 to send remote notifications through the TrolMaster or TM+ apps.

NFS-1

Max. 8 pcs
in combination

NFS-2

Max. 50 pcs
in combination

NFS-1

Max. 8 pcs
in combination

NFS-2

Max. 50 pcs
in combination

Water Content Sensor (WCS-1)

The WCS-1 water content sensor allows the user to monitor the % of water (water content) within the growing medium. The moisture level/water content is displayed in real-time on the WCS module itself, the Aqua-X controllers and the TrolMaster APP. That data is displayed on a graph (through the APP) and helps the user visualize the dry-down time, and to make adjustments to their irrigation timers/fertigation cycles. Up to 8 WCS-1 can be connected to a single Aqua-X.



Watering Confirmation / Auto-filling for Reservoirs



Water Detector (WD-1)

The WD-1 Water Detector can be used in THREE different ways:

Water Leak Detection:
Monitor and push an APP alert if water is detected on the floor or any space that should not be exposed to water.

Water Confirmation:
By assigning the WD-1 to the particular output (solenoid or pump), an alert of "Irrigation Failed" will be pushed through the APP if water is not detected.

Auto-fill (Only available on Aqua-X Pro):
By positioning one Water Detector at the bottom of the nutrient tank and another one at the top of the tank, the auto-fill function will be activated once the liquid level drops below the bottom sensor.

NFS-1 Max. 25 pcs in combination	NFS-2 Max. 50 pcs in combination
--	--

24V Control



24V Control Board (OA6-24)

The OA6-24 control board is designed to control multiple 24VAC solenoid valves. It provides an easy and efficient method to control up to 6 valves with individual timer settings. The Aqua-X can also provide a "master pump link" by using a DSP-1/2, DSD-1, or DSV-1 along with the OA6-24. Connecting a DSP-1/2, DSD-1, or DSV-1 to the OA6-24 provides an automatic "pump link" between the DSP-1/2, DSD-1, or DSV-1 and the OA6-24. When any of the 24VAC irrigation zones are activated on the OA6-24, the DSP-1/2, DSD-1, or DSV-1 will automatically turn on the pump.

**Max. ONE linked Master Pump for 24V control on Aqua-X(NFS-1). Up to 50 Master Pump links can be used on the NFS-2 / Aqua-x Pro controller.*

NFS-1 Max. 5 pcs in combination	NFS-2 Max. 50 pcs in combination
---------------------------------------	--

24V Control

Low-Volt Station (DSV-1)

Rated @12/24 VDC @ 0.5-amps or 12/24 VAC @ 4.8 VA

NFS-1 Max. 5 pcs in combination	NFS-2 Max. 50 pcs in combination
---------------------------------------	--



The DSV-1 is a low-voltage output module that can be used on the Aqua-X systems. Multiple voltage outputs are selectable by the user. The DSV-1 can output either 12 or 24 VDC up to .5 amps, or 12 or 24 VAC up to 4.8VA. Once the module is configured it will activate the low-volt device wired to the DSV-1, such as solenoid valves, contactors or audiovisual alarms.

110V Control



110V Control Board (OA6-110)

The OA6-110 control board is designed to control small 110V pumps or solenoid valves (less than 1.5 amps). The OA6-110 has 6 separately controlled 110-volt outlets. Each has an LED indicator to show whether the outlet is ON or OFF.

NFS-1 Max. 5 pcs in combination	NFS-2 Max. 50 pcs in combination
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110V Control



DSP-1
120 Volt Power (Nema 5-15)



DSP-2
240 Volt Power (Nema 6-15)

Program Device Station (DSP-1 & DSP-2)

Rated @10-amps

The TrolMaster DSP-1 & DSP-2 program device module (timer module) works like a multi-function irrigation timer. The timers for the DSP-1 / DSP-2 can be set to activate at a specific time(s) of day or night, as well as configured to function as a recycling timer with or without a maximum number of cycle settings. The DSP-1/2 can also be used as a "master pump" controller on the Aqua-X (NFS-1).

NFS-1 Max. 5 pcs in combination	NFS-2 Max. 50 pcs in combination
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110V Control



Expander Station (4RS-1)

Rated @120/240 volts, up to 50-amps total / 20-amps per power outlet

The 4RS-1 is a universal 4-outlet power expansion module. It can be used with any of TrolMaster's "plug-in" style device modules to expand the number of devices that can be controlled by the Hydro-x. A single 120-240 volt "trigger" cable on the 4RS-1 connects to your device/control module. When the device module is activated by the Hydro-x, the 4RS-1 trigger cable will turn on each of the 4 universal 120/240V receptacles on the 4RS-1 with a 3-second time delay between each outlet being activated. That minimizes high start-up (inrush current) and allows up to 4 devices to be safely controlled. The 4RS-1 must be installed with a 120/240-volt power circuit (up to 50-amps @ 240vac). Three wire terminals inside the unit accept up to #6 AWG wire making connections to the power source easy.

Use with
DSP-1/2
&
OA6-110

Dry Contact

Dry Contact Station (DSD-1)

Rated @30VDC/250VAC up to 6-amps



NFS-1
Max. 5 pcs
in combination

NFS-2
Max. 50 pcs
in combination

The TrolMaster DSD-1 Dry Contact Station provides a simple and flexible solution to users who want to connect & control devices to the Aqua-X systems using a "dry contact" or relay to activate the device. Some equipment requires either Normally Open or Normally Closed contact closure in order to activate the equipment. The DSD-1 is the product that you need to control those types of devices. The DSD-1 can be configured to work as the other TrolMaster DS modules work. The DSD-1 connected to the Aqua-X systems can be set to control as a program device module (timer module) that works like a multi-function irrigation timer, which can be set to activate at a specific time(s) of day or night, as well as configured to function as a recycling timer with or without a maximum number of cycle settings.

Dry Contact Board (OM-8)

Rated @30VDC/250VAC up to 12-amps



For Aqua-X Pro (NFS-2)



Counts as 8 Dry-contact modules in combination



The OM-8 dry contact board is designed primarily to control up to 8 separate pumps. It allows the NFS-2 controller to "link" the 8 individual outputs on it to any of the solenoids also controlled by the NFS-2 in order to create an intelligent controller. It is specially designed for the Hydro-X Pro and Aqua-X Pro systems. It has 8 individual electrical Normally Open contacts and allows up to 12 Amps @ 240VAC current through each contact. The OM-8 can activate pumps or solenoids when used with the Aqua-X Pro.

*The OM-8 should be connected to a power supply between 100-240vac.

NFS-2
Replace up to
8
DSD-1 modules

Audible and Visible Alarm

Alarm Station 5 (AS-5)



The AS-5 audiovisual alarm module can be connected to the NFS-2, so that if the controller detects any alarm conditions, the AS-5 will immediately alert the user. The user can then acknowledge the alarm and silence it directly on the controller touchscreen.

Connection

Extension Cable



16ft Extension Cable for AMP-2 Sensor Board (ECS-4)

The ECS-4 extension cable is a 16 ft extension cable to use with the AMP-2 sensor board. It has a male and female end which can extend the distance between the AMP-2 sensor board and the main controller.

*Only a single ECS-4 can be used inline with the AMP-2 to add 16ft to the existing ECS-2 cable.

RJ12 to 4-pin connector

16ft 4-Pins Waterproof Extension Cable (ECS-6)



The ECS-6 Extension Cable is simply a 16ft extension cable to use with the WCS-1 / 2 moisture content sensor. It has a male and female end which can extend the distance between WCS-1/2 module and the sensor probe.

*Only a single ECS-6 can be used inline with the WCS-1/2 to add 16ft to the existing WCS-1/2 sensor cable.

RJ12 Extension Coupler

RJ12 Waterproof Straight-Through Inline Coupler (ECW-1)



The TrolMaster ECW-1 RJ12 Waterproof Straight-Through Inline Coupler (2-Pack) is designed to extend the connection between two RJ12 cables, its sealed waterproof connectors prevents water intrusion, thus maintaining a long-lasting and stable connection with high performance between controller, sensors and devices.



Touch Spot Set (TSS-1)

Additional detector can be added to the WD-1 by using the TSS-1 / T-splitter and water detector (sensor) set. In order to monitor multiple points by using a single WD-1. The package comes with a T-splitter and an additional water detector. It helps monitoring for water spills, floods or any water run-off at multiple locations.

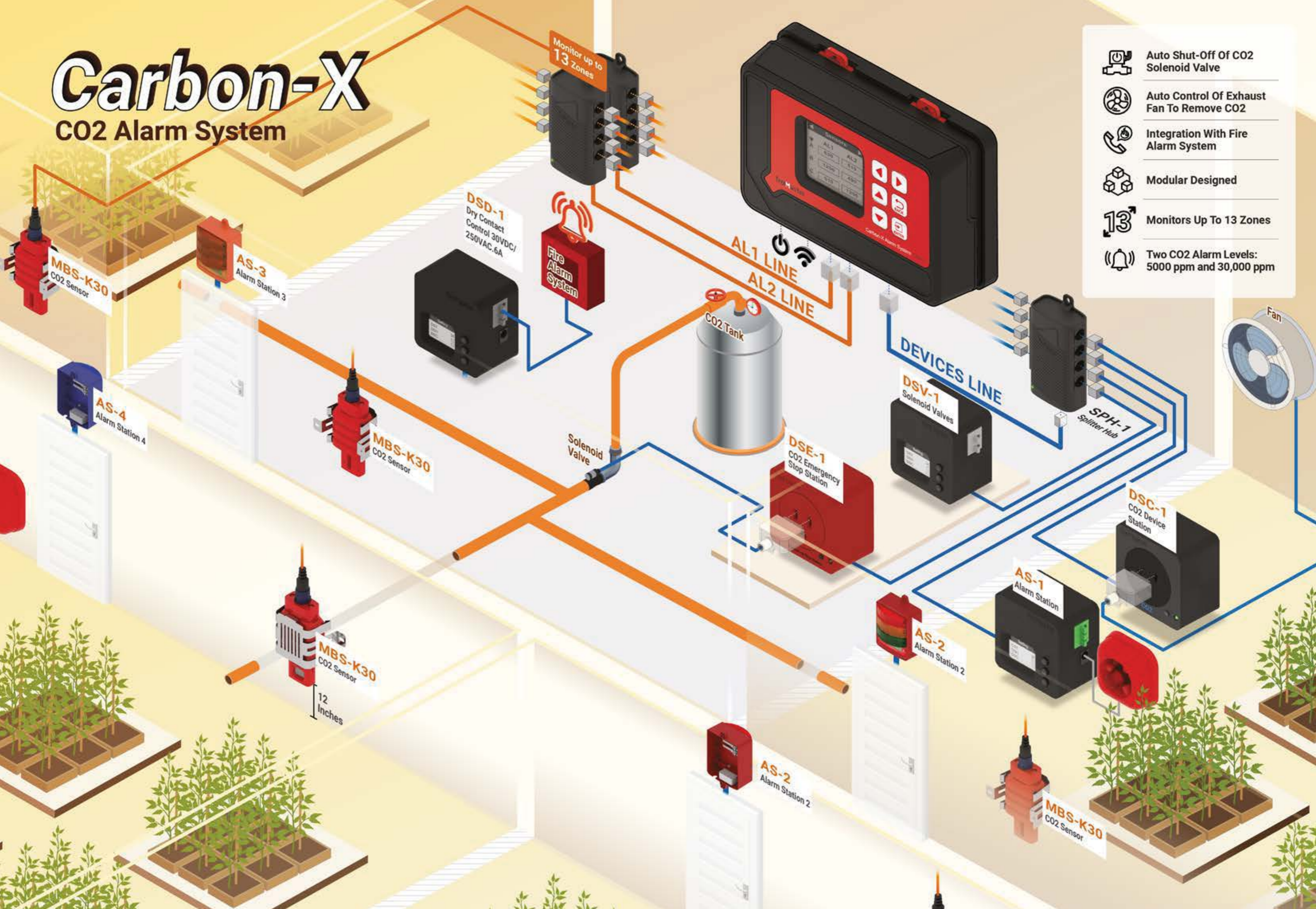
Touch Spot Extension Cable (TSS-2)



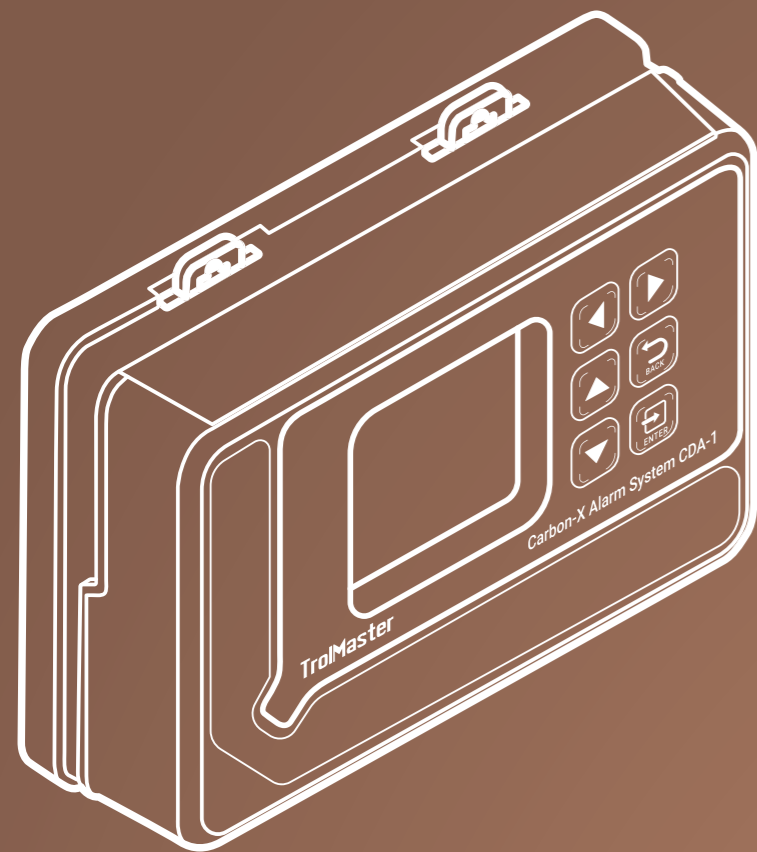
The TSS-2 extension cable is a 16 ft extension cable to use with the WD-1 water detectors. It has a male and female end which can extend the distance between 2 sensors (or distance between WD-1 module and the sensor).

Carbon-X

CO2 Alarm System



-  Auto Shut-Off Of CO2 Solenoid Valve
-  Auto Control Of Exhaust Fan To Remove CO2
-  Integration With Fire Alarm System
-  Modular Designed
- 13**  Monitors Up To 13 Zones
-  Two CO2 Alarm Levels: 5000 ppm and 30,000 ppm



What is the Carbon-X System?

The Carbon-X (CDA-1) System is designed to protect customers and employees working within commercial indoor growing areas that use supplemental CO2. When using CO2 indoors, it is critical to be able to monitor the overall CO2 level and activate an alarm and safely shut down the CO2 if the CO2 level gets above safe levels. The CDA-1 has been designed to satisfy all local and state regulations, related to the use of CO2 indoors. The CDA-1 is NOT a CO2 controller, it is a redundant CO2 Emergency Shutdown system that is required by most municipalities within N. America and beyond.

A single CDA-1 controller provides critical monitoring of CO2 levels in up to 13 separate zones. The Carbon-X System offers both high and low-level CO2 alerts. The specially designed CO2 sensors will constantly monitor the CO2 level of the areas. If an unsafe level of CO2 is detected, the system can shut down CO2 flow, ventilate the area, turn on visible and audible alarms and even send signals to a fire alarm panel and an emergency call to the fire department by interfacing with the fire/ alarm panel in the facility. The Carbon-X System can also control various devices such as ventilation fans, dampers, and main CO2 valves.

Carbon-X System
Overview Video



Master Controller

Alerts and Remote Control:  APP  Web-based

Carbon-X Controller (CDA-1)



13



Auto Shut-Off
Of CO2 Solenoid
Valve

Monitors Up To 13
Zones/Rooms

Auto Control Of
Exhaust Fan To
Remove CO2

Auto Integration
With Facility's Fire
Alarm System



The TrolMaster Carbon-X system provides critical monitoring of CO2 levels for up to 13 separate zones/rooms. The system can have both high-level (up to 30,000ppm) alerts, and low-level (5,000ppm) alerts. Both high and low-level limits are user-adjustable to meet local regulations for supplemental CO2 use indoors.

The Carbon-X system can also control various devices such as ventilation fans, dampers, and main CO2 valves as well as to send a signal to the fire department by interfacing to the fire/ alarm panel in the facility. Automatic shut-off of CO2 is accomplished by wiring the facility's main CO2 solenoid in series with one of the system control modules. The settings

for each of the devices connected to the system are user-selectable for easy customization. Each room monitored by the Carbon-X will also require one of the 5 available audiovisual alarm stations, to alert the personnel to the unsafe/ high level of CO2 in the area, and whether it is safe to occupy the area.

The TrolMaster app can be used to remotely monitor the Carbon-X as well as to receive user alert/notifications in case high CO2 levels are detected within one of the monitored spaces. If the alarm is triggered due to high CO2 levels, the CDA-1 must be manually reset by the user to deactivate the alarm system.

Sensor



CO2 30,000PPM Sensor (MBS-K30)

The ability to read up to 30,000 ppm CO2 is critical to the proper operation and safety of an emergency CO2 system like the Carbon-X. The MBS-K30 is TrolMaster's newest CO2 sensor, which incorporates a NDIR 0-30,000 ppm sensor in a self-aspirated enclosure. The MBS-K30 also features a built-in LCD display that will constantly display the current CO2 level (ppm). Each of the zones/rooms monitored by the Carbon-X can have 1 or 2 MBS-K30 CO2 sensors installed in order to satisfy local code requirements.

**The MBS-K30 requires the SPH-1 for supplemental power.*

Audible and Visible Alarm

Alarm Station (AS-1)



The AS-1 CO2 Alarm Station is an audio / visual alarm to be mounted inside or outside the room to be monitored, and sound an alarm (both visible and audible) in the event of the CO2 level going above normal or safe levels. It can be linked to either the low or the high level CO2 sensors, or it can be linked to both sensors for complete redundancy.

Audible and Visible Alarm



Alarm Station 2 (AS-2)

The AS-2 CO2 Alarm Station combines an audiovisual alarm module with a color-coded LED display indicator and a LCD digital ppm level reading. It is designed to be mounted outside (or inside) of the space to be monitored and will display the current measured CO2 ppm level. The AS-2 can be linked to either the low or the high-level CO2 sensors, or it can be linked to both sensors for complete redundancy.

The green LED indicator on the AS-2 shows the CO2 level is below 800ppm which means the room is safe to enter. The yellow LED indicator shows a CO2 level equal to or above 800ppm which means supplemental CO2 is in use. The AS-2 will sound an audible alarm and blink a red LED indicator in the event of the CO2 level going above normal or safe levels.

**The AS-2 requires the SPH-1 for supplemental power.*



AS-3 Alarm Station 3



AS-4 Alarm Station 4

Alarm Station (AS-3 & AS-4)

The AS-3 / AS-4 CO2 Alarm Station combines an audiovisual alarm module with Amber-colored/Blue-colored LEDs and a digital LCD displaying the CO2 ppm level reading. Some municipalities require both low and high-level CO2 alarms. They require an Amber colored / Blue-colored alarm station to indicate the alarm has been activated. The AS-3/AS-4 is designed to be mounted outside of the area/space to be monitored.

**The AS-3/AS-4 requires the SPH-1 for supplemental power.*

Emergency Control

CO2 Emergency Stop Station (DSE-1)



The DSE-1 CO2 Emergency Stop Station provides a simple method to shut off the CO2 supply when any fault or high CO2 level is detected. It is a 120V controlled outlet that supplies the power to CO2 solenoid valves in normal operation. The DSE-1 is designed to "stack" on the existing CO2 control module like TrolMaster's DSC-1 to provide a redundant shut-off capability. The Carbon-X will then automatically shut off DSE-1 power if any fault or high CO2 level is detected within any of the installed CO2 sensors. If the DSE-1 loses communication with the Carbon-X, the power supply will also be disabled.

Emergency Control



CO2 Device Station (DSC-1)

120 Volt Power (Nema 5-15)
Rated @10-amps

The DSC-1 is a 120V controlled outlet that is designed to turn on devices like ventilation fans if any fault or high CO2 level is detected. Any CO2 device that is 10-amps @ 120v or less can be controlled by the DSC-1.

**Larger fans can be controlled using the DSC-1 and a 4RS-1 power expansion module.*

Dry Contact Station (DSD-1)

Rated @30VDC/250VAC up to 6-amps



The DSD-1 is a Dry Contact output. Both N/O normally open and N/C normally closed connections are provided on the DSD-1 module.

Almost any device up to 6-amps @ 240v or less, that requires a "dry-contact" or relay to activate will work with the DSD-1. The DSD-1 can also be used to interface with the fire/alarm panel in the facility.

Connection

TrolMaster Sensor Bracket (TSB-1)



The TSB-1 TrolMaster Sensor Bracket is an optional wall mount bracket specially designed for the MBS-K30 & MBS-PRO sensors. Users can attach their MBS PRO or MBS K30 sensor on the wall, instead of allowing it to hang freely.

RJ12 Splitter Hub (SPH-1)



The SPH-1 is a powered hub designed to allow multiple CO2 sensors and device modules to be connected to the Carbon-X. Sensors can be connected to one SPH-1, and the device modules and alarm stations can be connected to another SPH-1. Multiple SPH-1 can be "daisy-chained" together. All CO2 sensors and/or device stations connected to the Carbon-X by using the SPH-1 will have supplemental power provided through the single RJ12 communications cable making connections easy. This provides for a simple and clean installation of all sensors and devices connected to the Carbon-X without requiring separate power sources for each device.

500ft RJ12 Cable Roll (ECS-500)

RJ12 to RJ12

When doing commercial installations of the CDA-1 and other TrolMaster control systems, you will see that RJ12 / 6-wire cables are used throughout the system. TrolMaster offers a 500 ft roll of RJ12 cable that also comes with 100 of the correct 6P6C crimp-on ends and rubber boots. The ECS-500 allows customer cables to be made to the correct lengths.



RJ12 to RJ12

RJ12 Extension Cable Set (ECS-1)

TrolMaster modules and sensors all come complete with a RJ12 16ft cable, Y-splitter and RJ12 4 ft cable to connect to the Carbon-X. When connecting modules that are farther apart, you can use the Extension cable set ECS-1. The ECS-1 comes complete with another 16ft cable, Y-splitter and 4 ft cable.



Controller Cabinets

Applicable: Hydro-X Plus Hydro-X Pro Aqua-X Pro

25" Standard Controller Cabinet (SCC-1)



6.26" (D) x 18" (W) x 25" (H)

IP56 Rated

Detachable Design for OA6 module

47 Bi-directional RJ12 Ports

Cabinet Capacity

RJ12 Cable Splitter Board: 4 Boards & 39 ports in total

RJ12 Cable Splitter Bar: 2 Bars & 8 ports in total

Power Outlet Port: 11 ports

The SCC-1 Standard Controller Cabinet is the smaller version of the modular electrical and wire management enclosure for the TrolMaster HCS-2 and NFS-2 Control systems. A pre-cut opening on the front cover of the SCC-1 allows the main controller Hydro-X Pro (HCS-2) or Aqua-X Pro (NFS-2) to be easily installed.

35" Large Controller Cabinet (SCC-2)



6.26" (D) x 18" (W) x 35" (H)

IP56 rated

Detachable Design for OA6 module

55 Bi-directional RJ12 Ports

Cabinet Capacity

RJ12 Cable Splitter Board: 4 Boards & 39 ports in total

RJ12 Cable Splitter Bar: 4 Bars & 16 ports in total

Power Outlet Port: 15 ports

The SCC-2 Large Controller Cabinet is the larger version of the modular electrical and wire management enclosure for the TrolMaster HCS-2 and NFS-2 Control systems. A pre-cut opening on the front cover of the SCC-2 allows the main controller Hydro-X Pro (HCS-2) or Aqua-X Pro (NFS-2) to be easily installed.

25" Standard Controller Cabinet (SCC-3)



6.26" (D) x 18" (W) x 25" (H)

IP56 rated

Detachable Design for OA6 module

47 Bi-directional RJ12 Ports

Cabinet Capacity

RJ12 Cable Splitter Board: 4 Boards & 39 ports in total

RJ12 Cable Splitter Bar: 2 Bars & 8 ports in total

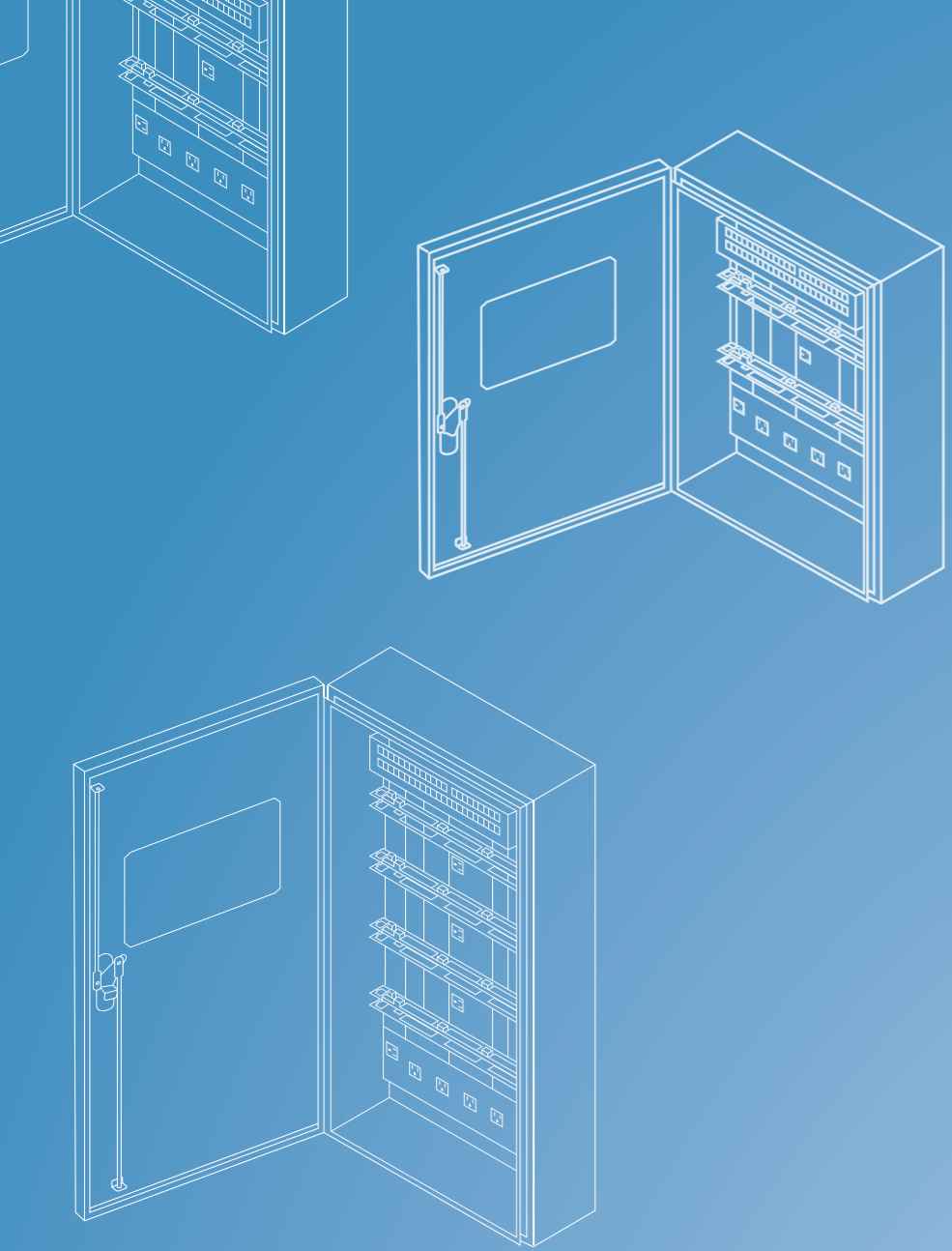
Power Outlet Port: 11 ports

The SCC-3 Standard Controller Cabinet is a modular electrical and wire management enclosure for the TrolMaster HCS-3 Control system. A pre-cut opening on the front cover of the SCC-3 allows the main controller Hydro-X Plus (HCS-3) to be easily installed.

What is the TrolMaster Controller Cabinets?

The SCC-1, 2 and 3 Controller Cabinets are pre-wired modular electrical enclosures for wire and control module management. It is specially designed for the TrolMaster environmental and irrigation control systems. TrolMaster's main controllers like the HCS-2, NFS-2 and HCS-3 install directly into the pre-cut opening in the front cover of the Controller Cabinet.

All of the TrolMaster device stations can also be mounted inside the controller cabinets to keep the device stations clean and dry. Users can also safely install mount and neatly organize the power supplies, plug in device modules, and RJ12 cables inside the IP56-rated electrical cabinets. The cabinet comes in THREE different models to select from.



Single Task Controller

Hawkeye (CM-1)



The Hawkeye is designed specifically to be used as a backup remote monitoring system to ensure environmental conditions within a grow space stay within acceptable limits. The Hawkeye comes COMPLETE with everything you will need to measure temperature, humidity, CO2 and will also provide an accurate VPD (Vapor Pressure Deficit) measurement. The user can select the minimum and maximum

allowable (limits) for temperature, humidity and CO2 levels. If those limits are exceeded, Hawkeye will notify the user via the TrolMaster APP and audible and visual alerts on the LED digital display.

**The Hawkeye is NOT a controller, it is a remote environmental monitoring system.*

BETA Series

The BETA series is a simple single-function controller line for people who prefer simple task controllers. These controllers have the same high accuracy and reliability as always based on our experience of over 10 years in the industry.



Digital Day/ Night Remote Controller (BETA-1)

The Beta-1 is a simple solution for Mini Split Air Conditioners to be able to have both Day and Night temperature settings. It uses the remote control that came with your mini-split air-conditioner to "learn" how to change the set points on the mini-split. Once the Beta-1 learns the signals from your remote controller, it will automatically change the set point on the mini-split to two separate Day and Night temperatures. It does this AUTOMATICALLY by using a small IR (infrared) emitter / sending unit that will send the same signal to the mini-split, as the remote control would normally send.

**The BETA-1 is currently not compatible with the following brands of devices: Daiken, Mr. Cool, Innovair, Cooper and Hunter.*



Digital Day/ Night Fan Speed Controller (BETA-2)

The BETA-2 can control variable-speed fans by using the current temperature to increase or decrease the fan speed. By increasing the fan speed, cooling is increased... decreasing fan speed will reduce cooling capacity. Using the BETA-2 in this way provides a VERY economical and efficient way of dealing with heat within an enclosed space.



Digital Day/ Night Temperature Controller (BETA-4)

The BETA-4 is capable of controlling any heating or cooling device that is 10-amps or less. Simply plug in your device to the power outlet on the bottom of the BETA-4. It uses 3-buttons, a LED digital display and offers separate "day/night" temperature settings and features a built-in photocell. The Beta-4 can control either cooling or heating devices.



Digital Day/ Night Humidity Controller (BETA-6)

The BETA-6 features a precision humidity sensor within a 16ft remote probe assembly. Simply plug in your humidifying/dehumidifying device to the power outlet on the bottom of the BETA-6. The user can select separate "day/night" humidity settings and the photocell built into the BETA-6 will automatically start controlling your device. (Settings from 20-90% RH) Either humidifiers or dehumidifiers can be controlled by the BETA-6.



Digital Day/ CO2 ppm Controller With Fuzzy Logic (BETA-8)

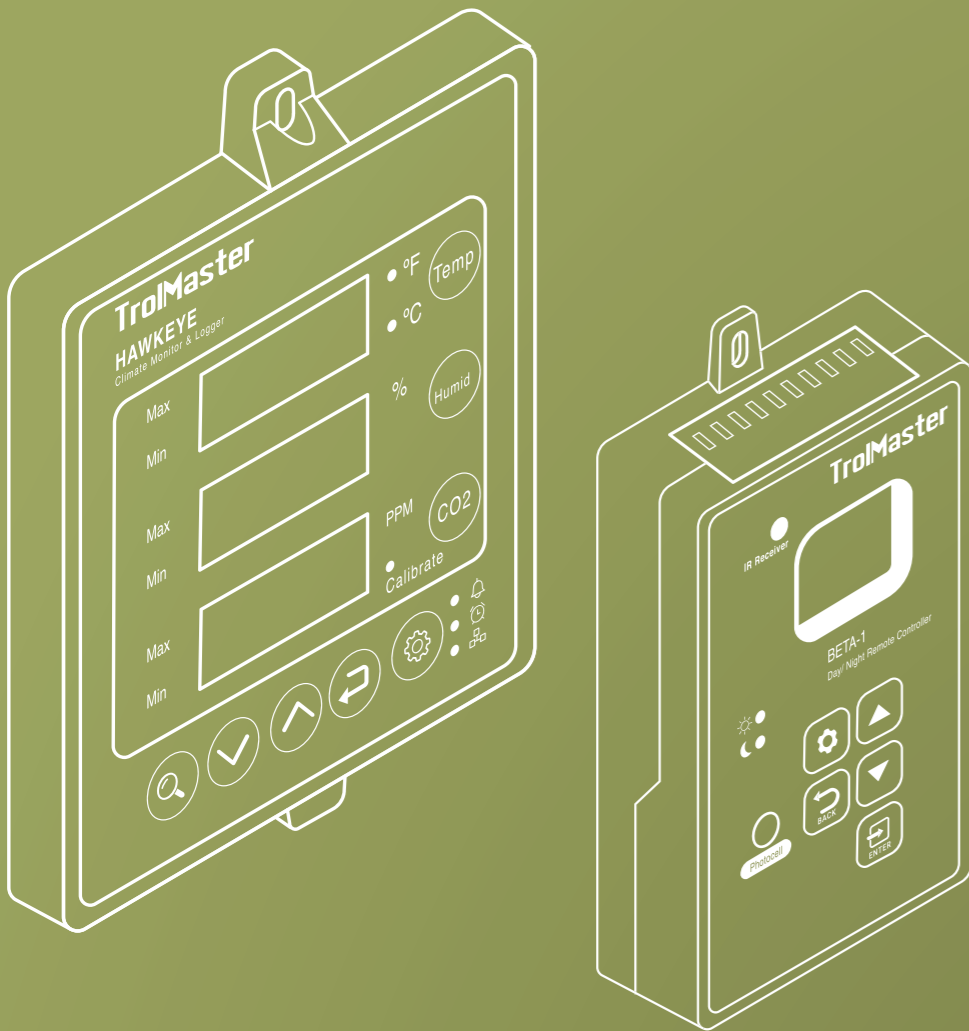
The BETA-8 CO2 controller offers a precision Carbon Dioxide / CO2 NDIR sensor / controller in an affordable easy-to-use package. The BETA-8 features a high-quality remote CO2 sensor (with 16ft cable) and built-in photocell to automatically activate your supplemental CO2 system to maintain CO2 PPM levels only during daylight hours. The BETA-8 also has an adjustable deadband and min-max recall. It also has a 'fuzzy-logic' feature which will more accurately control compressed CO2 systems.

What is the Single Task Controller?

Single Task Controllers provide an easy way for growers to control a single device within their grow room. Each of the Beta single-function controllers is designed to control ONE device. That device could be a fan, AC unit, heater, dehumidifier, humidifier, light, pump, CO2 device or other commonly used equipment within today's grow rooms.

The Beta unit comes complete with everything you would need including a precision sensor. So if you are looking for a simple, easy-to-use, and cost-effective controller, check out the complete line of Beta Single Task Controllers from TrolMaster.

Single Controller



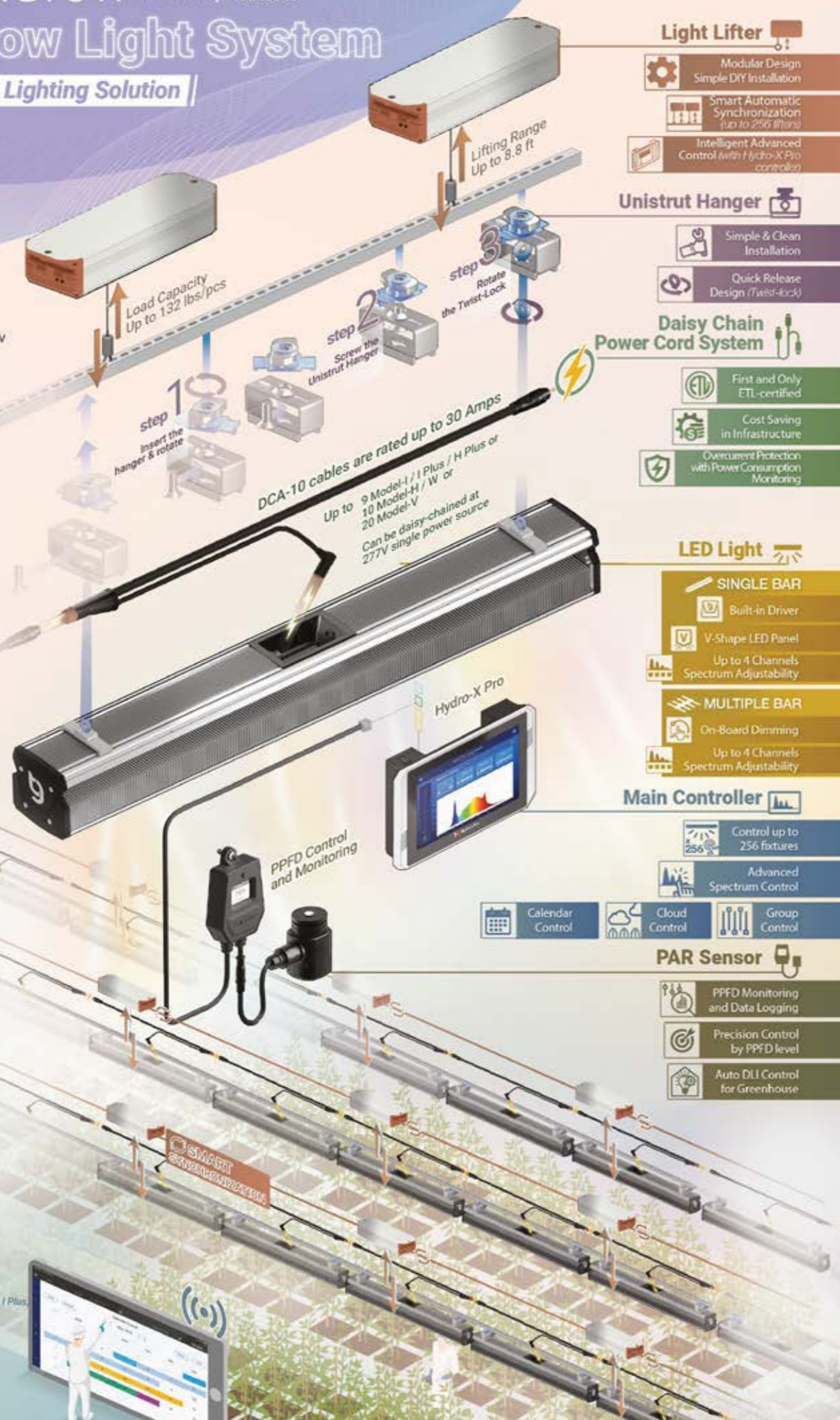
ThinkGrow Powered By TrolMaster

LED Grow Light System

Your One-Stop Lighting Solution

PRODUCT LIST

- LIGHT LIFTER
- LLT-1
- LIFTER REMOTE
- LRC-1
- UNISTRUT HANGER
- FOR MODEL - H-PLUS/H/W/V
- UH-1
- FOR MODEL - V1-PLUS
- UH-2
- 5' DAISY CHAIN Y SPLITTER CABLES
- 10 Gauge (DCA-10)
- 12 Gauge (DCA-12)
- 14 Gauge (DCA-14)
- 3' DAISY CHAIN EXTENSION CABLES
- 10 Gauge (DEA-10L)
- 10 Gauge (DEA-10)
- 12 Gauge (DEA-12)
- 14 Gauge (DEA-14)
- SMART JUNCTION BOX
- OPA-1
- MULTIPLE BAR LED GROW LIGHTS
- Model-H Plus
- Model-H
- Model-W
- Model-V
- SINGLE BAR LED GROW LIGHTS
- Model-I Plus
- Model-I
- MAIN CONTROLLERS
- Hydro-X Pro (HCS-2)
- Hydro-X Plus (HCS-3)
- Hydro-X (HCS-1)
- LIGHTING ADAPTER
- LMA-T (for all ThinkGrow LEDs)
- LMA-G (for Group Control on Model-I & I Plus)
- FULL SPECTRUM QUANTUM SENSOR
- MBS-PAR



Light Lifter

- Modular Design
- Simple DIY Installation
- Smart Automatic Synchronization (up to 256 fixtures)
- Intelligent Advanced Control with Hydro-X Pro controller

Unistrut Hanger

- Simple & Clean Installation
- Quick Release Design (Twist-Lock)

Daisy Chain Power Cord System

- First and Only ETL-certified
- Cost Saving in Infrastructure
- Overcurrent Protection with Power Consumption Monitoring

LED Light

- SINGLE BAR**
 - Built-in Driver
 - V-Shape LED Panel
 - Up to 4 Channels Spectrum Adjustability
- MULTIPLE BAR**
 - On-Board Dimming
 - Up to 4 Channels Spectrum Adjustability

Main Controller

- Control up to 256 fixtures
- Advanced Spectrum Control
- Calendar Control
- Cloud Control
- Group Control

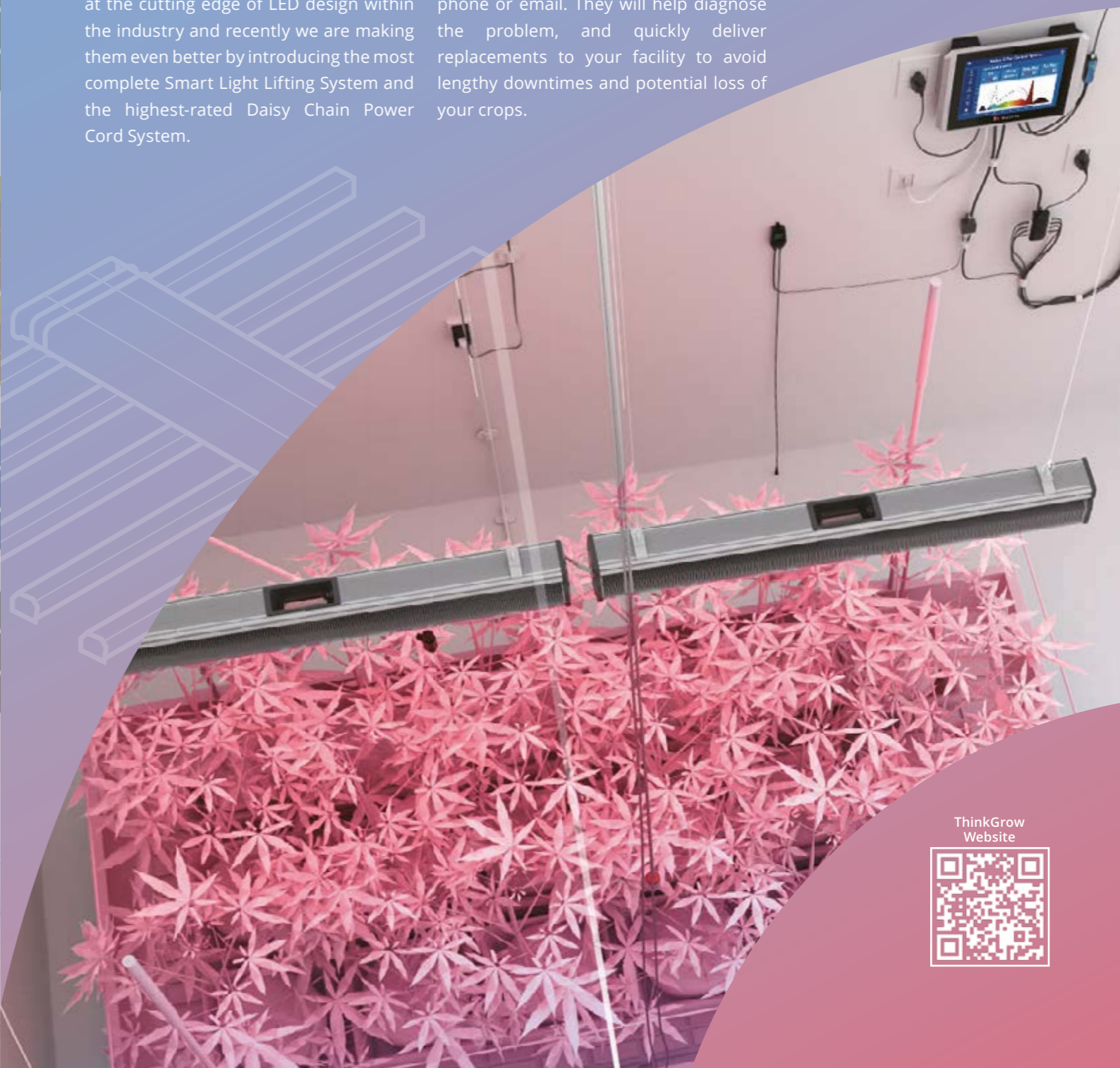
PAR Sensor

- PPFD Monitoring and Data Logging
- Precision Control by PPFD level
- Auto DLI Control for Greenhouse

Why ThinkGrow?

ThinkGrow is committed to providing our customers with the most advanced horticulture lighting solutions by using only top-quality components, coupled with the optimum controllability of the TrolMaster control systems, enabling growers to create the perfect grow room, from a single growing zone to large industrial facilities. ThinkGrow LEDs are at the cutting edge of LED design within the industry and recently we are making them even better by introducing the most complete Smart Light Lifting System and the highest-rated Daisy Chain Power Cord System.

We also offer a hassle-free full 5-year warranty on all our products. Here at ThinkGrow, we strive to solve your problem quickly and professionally. In the unlikely event of a malfunction, there's no need to wait weeks to process a return. If you have a problem with any of the ThinkGrow fixtures, you simply have to contact our tech support by phone or email. They will help diagnose the problem, and quickly deliver replacements to your facility to avoid lengthy downtimes and potential loss of your crops.



ThinkGrow Website



Multiple-Bar LEDs

Authorized partner of Samsung electronics



True 5' Wide Fixture



Outstanding Efficiency



4 Adjustable Spectrum Channels



Patented Plug and Play LED bar



10 Spectrum Group Control



Model-H Plus

The Model-H Plus is a **true 5' wide** LED grow light designed to be used in indoor grow rooms for high PPF cultivation practices in multi-tier vertical farming or single level indoor horticulture. The Model-H Plus fixture has an amazing 3368 individual LED diodes. Each of the 3368 are highly efficient top-bin diodes with a total wattage of 720 watts, resulting in an **18% PPF** increase in performance over the Standard Model-H LED. Features include onboard dimming and the ability to adjust the spectrum and light intensity by connecting the Model-H Plus fixtures with a controller. Four spectrum channels including UV, White (full spectrum), Deep Red and Far Red are fully controllable to customize your desired spectrum/recipe of light your plants need. (Spectrum Control is only available on the TrolMaster HCS-2/3). The ThinkGrow **patented plug-and-play LED light bar design** also offers ease of installation and facilitates future maintenance.

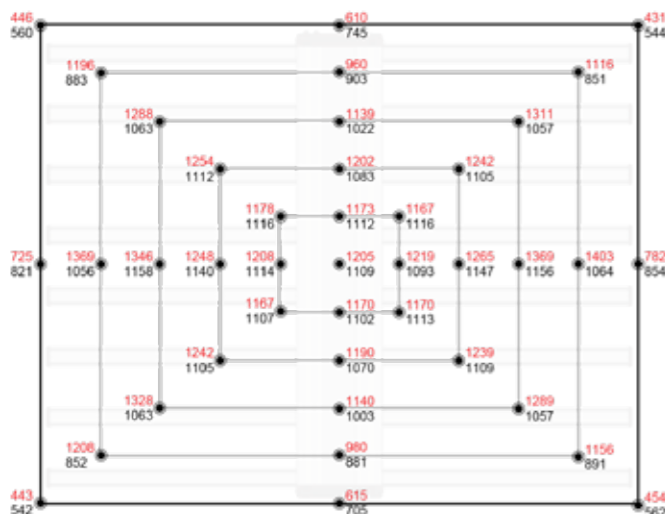


Specifications

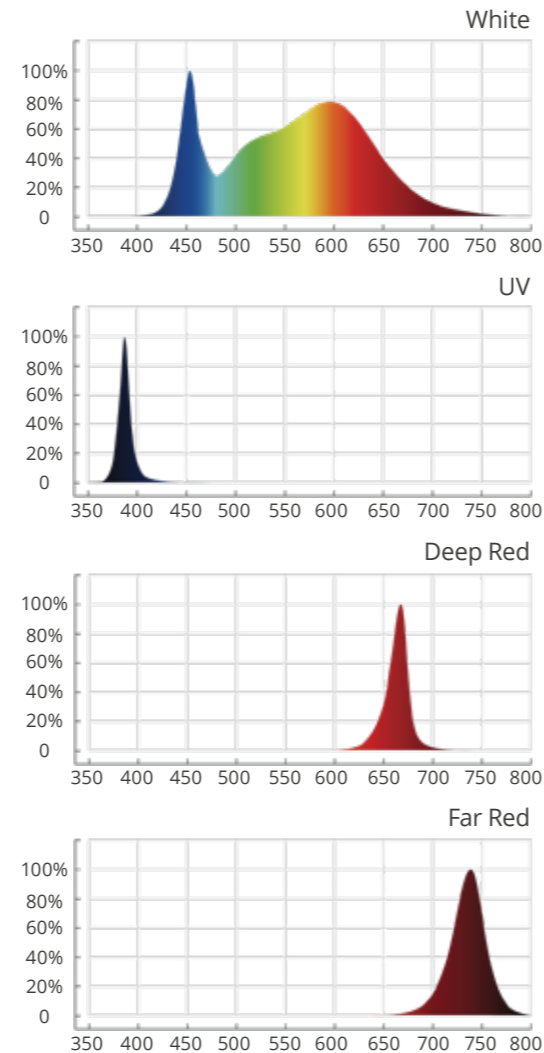
PPF :	>2016 $\mu\text{mol/s}$
Efficacy :	>2.8 $\mu\text{mol/J}$
Input Power :	720 W
Power Factor :	$\geq 96\%$
LED Diodes :	3368 diodes
Dimensions :	57"L x 44.6"W x 4.44"H
Weight:	41.8 lbs
Mounting Height :	> 6" (15.2cm) Above Canopy
Lifetime:	L90: > 54,000hrs
Warranty:	5 Years Standard Warranty
Input Voltage :	Autosensing 100-277 V
Amp Draw:	120V/6.23A, 240V/3.09A, 277V/2.71A

Model-H Plus (Tested at 6" Tested at 12")

Average PPF **1089 / 979**



Spectra



Multiple-Bar LEDs

Authorized partner of Samsung electronics



Outstanding Efficiency



Adjustable Full Spectrum



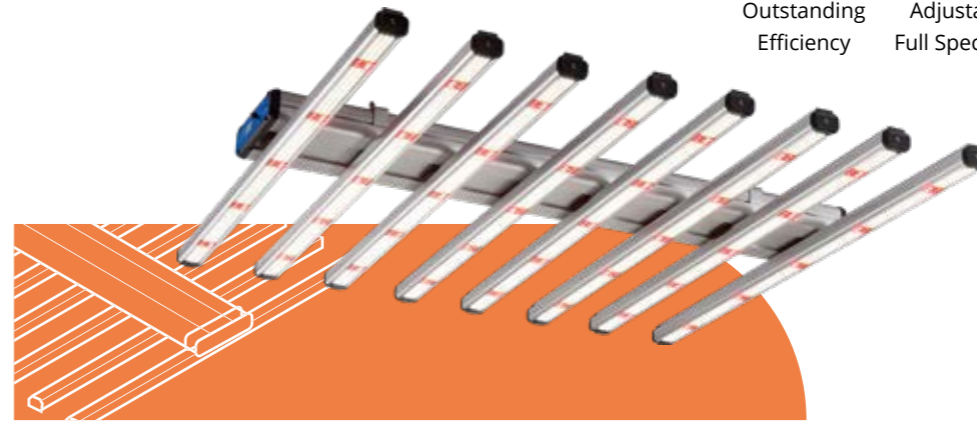
Patented Plug and Play LED bar



10 Group Control



On-Board Dimming



Model-H

The Model-H is a 4' wide LED grow light designed to cover 4' wide grow racks or tables for **high PPF cultivation** practices in multi-tier vertical farming or single level indoor horticulture. The full spectrum diodes on the Model-H are designed to cover each phase of plant growth from vegetative to flowering. The supplemental 660 nm Deep Red diodes provide spectral tuning capability and allows growers to selectively boost the amount of Red light for increased flower production.

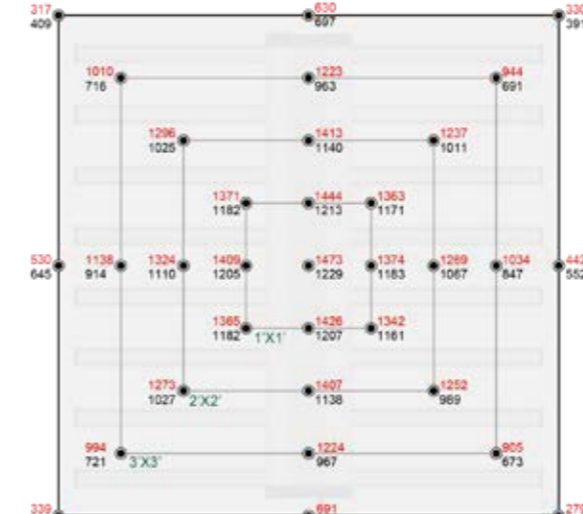


Specifications

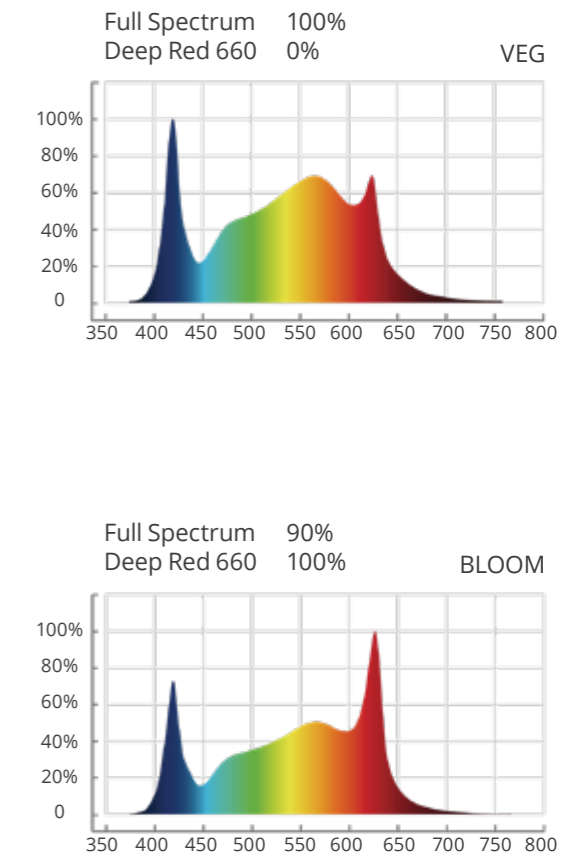
PPF :	>1700 $\mu\text{mol/s}$
Efficacy :	>2.7 $\mu\text{mol/J}$
Input Power :	630 W
Power Factor :	$\geq 90\%$
LED Diodes :	2320 diodes
Dimensions :	45"L x 44.6"W x 4.44"H
Weight:	38.8 lbs
Mounting Height :	> 6" (15.2cm) Above Canopy
Lifetime:	L90: > 54,000hrs
Warranty:	5 Years Standard Warranty
Input Voltage :	Autosensing 100-277 V
Amp Draw:	120V/5.24A, 240V/2.67A, 277V/2.35A

Model-H (Tested at 6" Tested at 12")

Average PPF **1079 / 904**



Spectra



Multiple-Bar LEDs

Authorized partner of Samsung electronics



Outstanding Efficiency



Efficient Full Spectrum Design



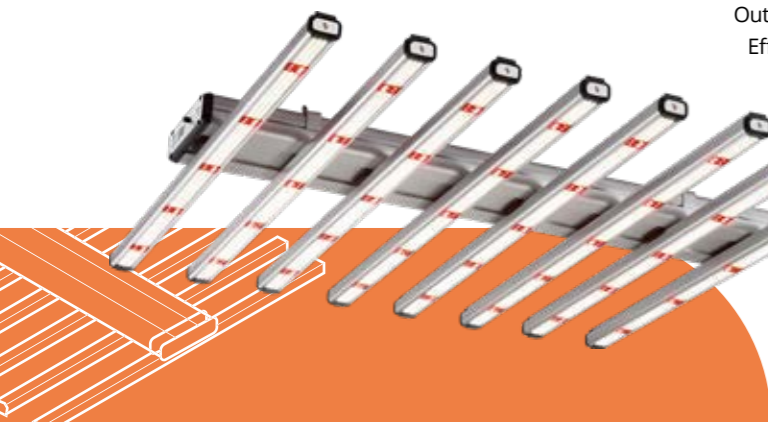
Patented Plug and Play LED bar



Independent Far Red Channel



10 Group Control



Model-W

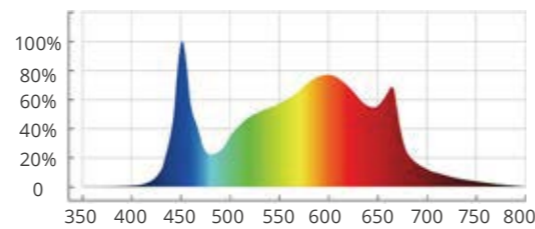
The Model-W is a **high-performance** and economical LED grow light for indoor horticulture. It is designed for high PPFD cultivation practices in multi-tier vertical farming or single level indoor horticulture. The Model-W's full spectrum design covers **each critical phase of growth from vegetative to flowering**. An independent Far Red 730 nm channel is designed to target Phytochrome Far Red in photomorphogenic lighting applications. Based on research, introducing far-red light after the full spectrum lights have been turned off will allow the plants to go to "sleep" faster, which can encourage the flowering process to be accelerated.

**ThinkGrow recommends introducing Far Red light for 10-15 mins after the day cycle is complete. A light controller like the TrolMaster HCS-1, 2 or 3 is required to manipulate and control the Far Red spectrum and timing.*

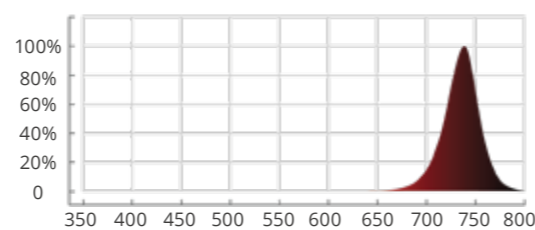


Spectra

Full Spectrum



Far Red

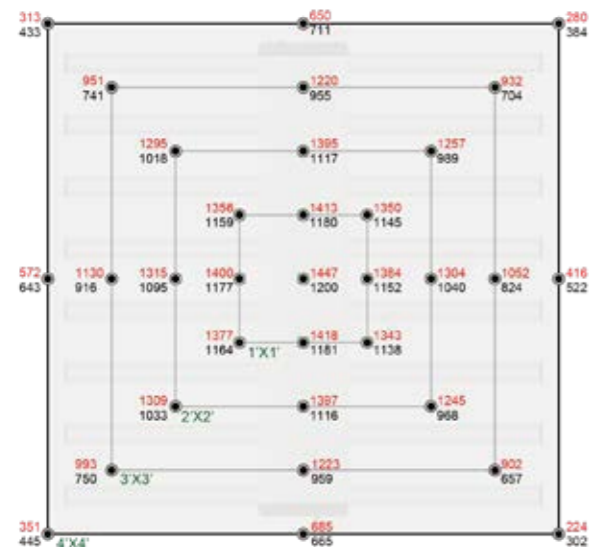


Specifications

PPF :	>1600 μmol/s
Efficacy :	>2.6 μmol/J
Input Power :	Max 630W (Full Spectrum) / 20W (Far Red)
Power Factor :	≥ 90%
LED Diodes :	2320 diodes
Dimensions :	45"L x 44.6" W x 4.44" H
Weight:	38.8 lbs
Mounting Height :	> 6" (15.2cm) Above Canopy
Lifetime:	L90: > 54,000hrs
Warranty:	5 Years Standard Warranty
Input Voltage :	Autosensing 100-277V
Amp Draw:	120V/5.26A, 240V/2.68A, 277V/2.38A

Model-W (Tested at 6" Tested at 12")

Average PPFD **1042 / 894**



Multiple-Bar LEDs

Authorized partner of Samsung electronics



Outstanding Efficiency



Efficient Full Spectrum Design



Patented Plug and Play LED bar



Independent Far Red Channel



10 Group Control



Model-V

The Model-V is a **high-performance** LED grow light primarily designed for lighting plants in the vegetating stage. It is designed to produce the perfect amount of light, with the correct spectrum. The Model-V's full spectrum design covers each critical phase of growth from early through late vegetation. An independent Far Red 730 nm channel is designed to target Phytochrome Far Red in photomorphogenic lighting applications.

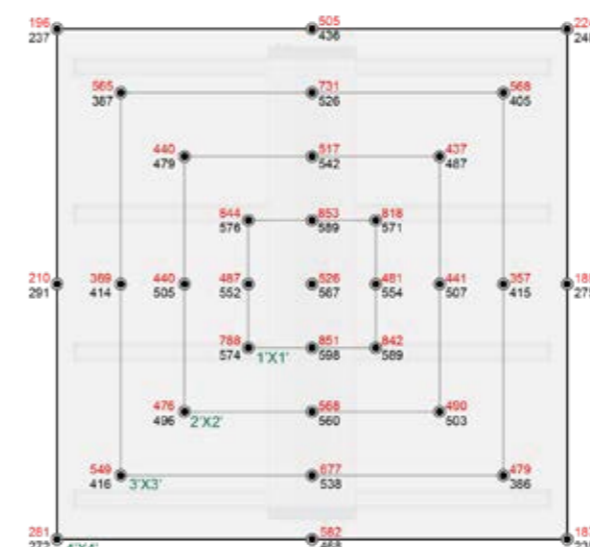


Specifications

PPF :	>900 μmol/s
Efficacy :	>2.6 μmol/J
Input Power :	Max 350W (Full Spectrum) / 10W (Far Red)
Power Factor :	≥ 90%
LED Diodes :	1160 diodes
Dimensions :	45"L x 44.6" W x 4.44" H
Weight:	23.62 lbs
Mounting Height :	> 6" (15.2cm) Above Canopy
Lifetime:	L90: > 54,000hrs
Warranty:	5 Years Standard Warranty
Input Voltage :	Autosensing 100-277V
Amp Draw:	120V/3.05A, 240V/1.55A, 277V/1.39A

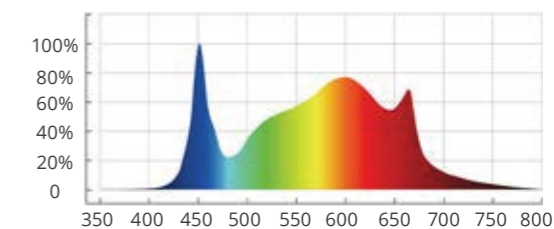
Model-V (Tested at 6" Tested at 12")

Average PPFD **514 / 461**

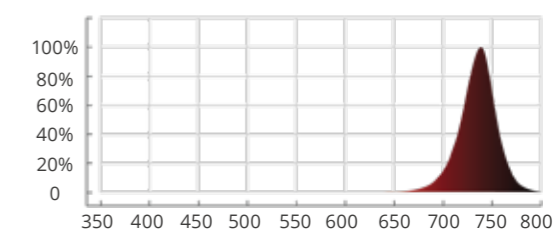


Spectra

Full Spectrum



Far Red



Single-Bar LEDs

Authorized partner of Samsung electronics



Outstanding Efficiency



Built-In Driver



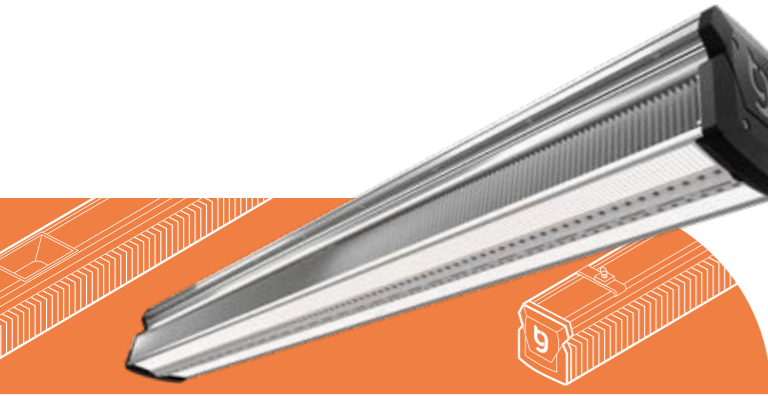
V-Shape LED Panel Design



4 Adjustable Spectrum Channels



IP66 Rated



Model-I Plus

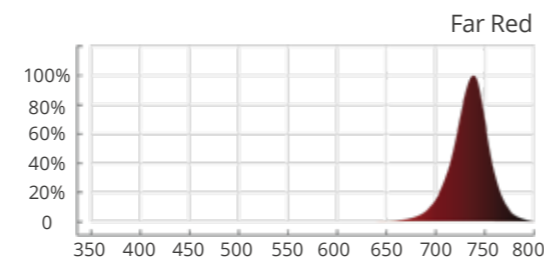
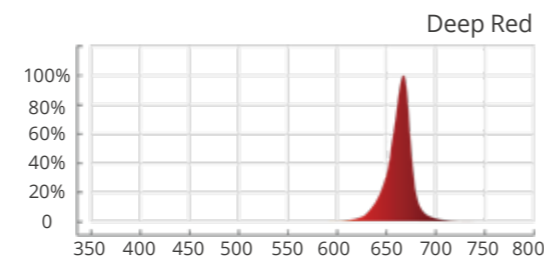
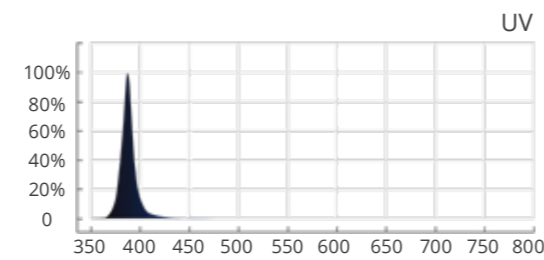
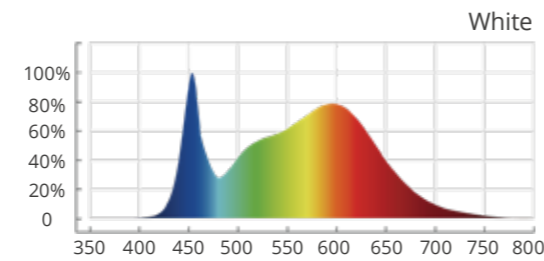
The Model-I Plus is ThinkGrow's best -performing LED grow light for single-tier cultivation applications. The compact design with a **built-in LED driver** results in an easy-to-install and reliable lighting solution. It is ideal for greenhouse and single-tier level indoor cultivation and was designed to be a 1 to 1 replacement for a 1000 watt HPS DE fixture. The innovative **V-shape design** of the LED panel improves light distribution to spread light over a wide area... up to 5 x 5ft. **Four individual spectrum channels including UV, White, Deep Red and Far Red** are independently controllable to dial in the exact recipe (spectrum) of light your plants need. (only available on the TrolMaster HCS-2/3 controller).



Specifications

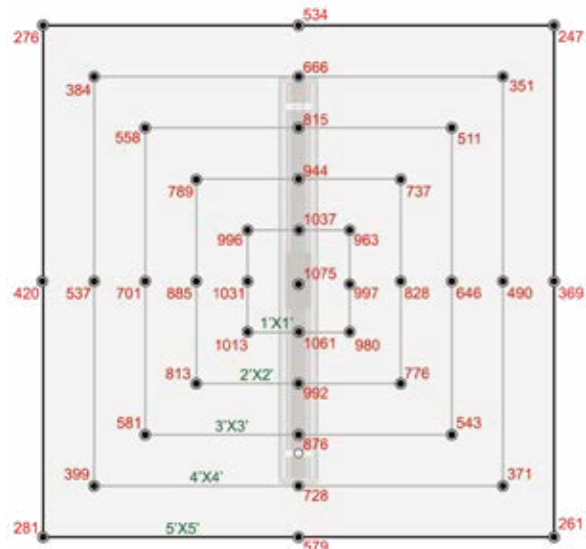
PPF :	>1944 $\mu\text{mol/s}$
Efficacy :	>2.7 $\mu\text{mol/J}$
Input Power :	720 W
Power Factor :	$\geq 96\%$
LED Diodes :	3326 diodes
Dimensions :	45.24"L x 4.36"W x 6.46"H
Weight:	22.33 lbs
Mounting Height :	> 2.5ft Above Canopy
Lifetime:	L90: > 54,000hrs
Warranty:	5 Years Standard Warranty
Input Voltage :	Autosensing 100-277 V
Amp Draw:	120V/6.23A, 240V/3.09A, 277V/2.71A

Spectra



Model-I Plus (Tested at 30")

Average PPFD **684**



Single-Bar LEDs

Authorized partner of Samsung electronics



Outstanding Efficiency



Built-In Driver



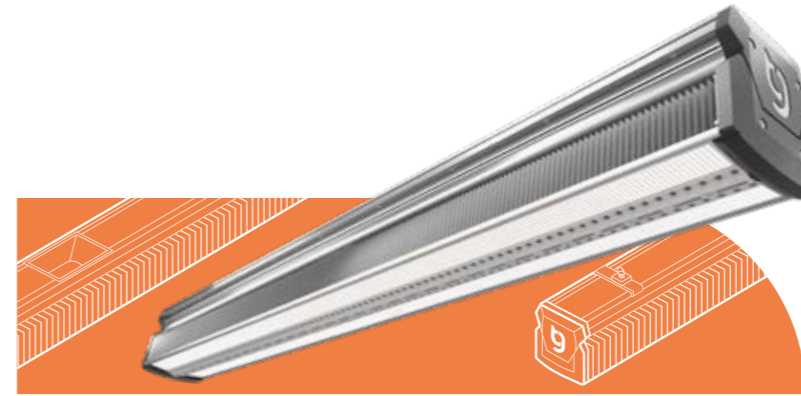
V-Shape LED Panel Design



Full Spectrum with UV Design



Individual Far Red Channel



Model-I

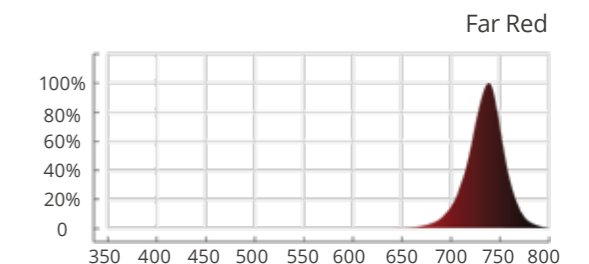
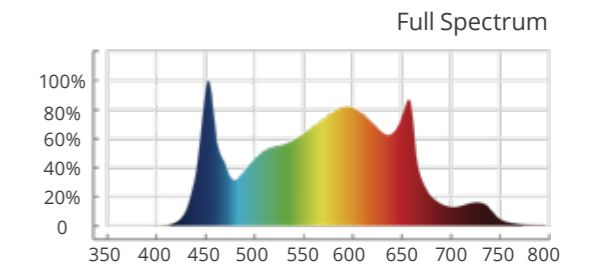
The Model-I is ThinkGrow's most affordable LED system. The Model-I produces the same amount of usable light as a 1000 watt HID does. It is PERFECT for use in traditional single-tier cultivation facilities. The compact design with a **built-in LED driver** results in an easy-to-install and reliable lighting solution. It is ideal for greenhouse or single-tier level indoor cultivation and was designed to be a 1-to-1 replacement for a 1000-watt HPS DE fixture. The innovative **V-shape design** on the LED panel improves light distribution to spread light over a wide area... up to 5 x 5ft. The Model I's Full spectrum design with UV produces a spectrum similar to natural sunlight, providing the perfect spectrum of light for each critical phase of growth from vegetative to flowering. An independent Far Red 730 nm channel is designed to target Phytochrome Far Red in photomorphogenic lighting applications. Based on research, introducing far-red light after the full spectrum lights have been turned off will allow the plants to go to "sleep" faster, which can encourage the flowering process to be accelerated.



Specifications

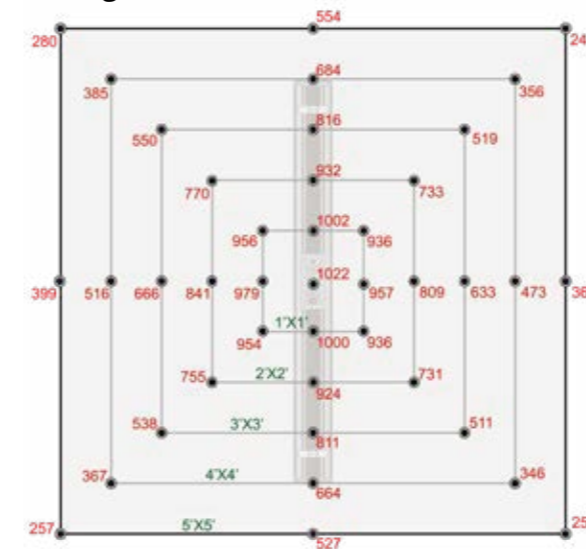
PPF :	>1829 $\mu\text{mol/s}$
Efficacy :	>2.54 $\mu\text{mol/J}$
Input Power :	720W
Power Factor :	$\geq 96\%$
LED Diodes :	2654 diodes
Dimensions :	45.24"L x 4.36" W x 6.46" H
Weight:	22.33 lbs
Mounting Height :	> 2.5ft Above Canopy
Lifetime:	L90: > 54,000hrs
Warranty:	5 Years Standard Warranty
Input Voltage :	Autosensing 100-277 V
Amp Draw:	120V/6.23A, 240V/3.09A/277V/2.71A

Spectra



Model-I (Tested at 30")

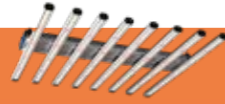
Average PPFD **657**



ThinkGrow Multiple-Bar LEDs Comparison



Model-H Plus



Model-H



Model-W



Model-V

Quick Look

PPF	>2016 $\mu\text{mol/s}$	>1700 $\mu\text{mol/s}$	>1600 $\mu\text{mol/s}$	>900 $\mu\text{mol/s}$
Input Power	720 Watts	630 Watts	630 Watts	350 Watts
Input Voltage	Autosensing 100-277 V	Autosensing 100-277 V	Autosensing 100-277 V	Autosensing 100-277 V
Efficacy	>2.8 $\mu\text{mol/J}$	>2.7 $\mu\text{mol/J}$	>2.6 $\mu\text{mol/J}$	>2.6 $\mu\text{mol/J}$
Amp Draw	120V/6.23A, 240V/3.09A, 277V/2.71A	120V/5.24A, 240V/2.67A, 277V/2.35A	120V/5.26A, 240V/2.68A, 277V/2.38A	120V/3.05A, 240V/1.55A, 277V/1.39A
BTU	2456.74 btu/h	2149.65 btu/h	2149.65 btu/h	1194.25 btu/h
Power Factor	$\geq 96\%$	$\geq 90\%$	$\geq 90\%$	$\geq 90\%$
Spectrum	4 Adjustable Spectrum Channels	Adjustable Full Spectrum and Deep Red Channel	Adjustable Full Spectrum Extra 20W Far Red Channel	Adjustable Full Spectrum Extra 10W Far Red Channel
LED diodes	3368 diodes	2320 diodes	2320 diodes	1160 diodes
Mounting Height	> 6" (15.2cm) Above Canopy	> 6" (15.2cm) Above Canopy	> 6" (15.2cm) Above Canopy	> 6" (15.2cm) Above Canopy
Control System	On board Dimming 256 Fixtures/Channel By External Controller	On board Dimming 256 Fixtures/Channel By External Controller	On board Dimming 256 Fixtures/Channel By External Controller	On board Dimming 256 Fixtures/Channel By External Controller
Lifetime	L90 > 54,000hrs	L90 > 54,000hrs	L90 > 54,000hrs	L90 > 54,000hrs
IP Rating	IP56	IP56	IP56	IP56
ETL Listed	✓	✓	✓	✓
DLC Listed LED	✓	✓	✓	✓
Dimensions	57"L x 44.6"W x 4.44"H	45"L x 44.6"W x 4.44"H	45"L x 44.6"W x 4.44"H	45"L x 44.6"W x 4.44"H
Weight	41.8 lbs	38.8 lbs	38.8 lbs	23.62 lbs
Warranty	5 Years Standard Warranty	5 Years Standard Warranty	5 Years Standard Warranty	5 Years Standard Warranty

ThinkGrow Single-Bar LEDs Comparison



Model-I Plus



Model-I

Quick Look

PPF	>1944 $\mu\text{mol/s}$	>1829 $\mu\text{mol/s}$
Input Power	720 Watts	720 Watts
Input Voltage	Autosensing 100-277 V	Autosensing 100-277 V
Efficacy	>2.7 $\mu\text{mol/J}$	>2.54 $\mu\text{mol/J}$
Amp Draw	120V/6.23A, 240V/3.09A, 277V/2.71A	120V/6.23A, 240V/3.09A, 277V/2.71A
BTU	2456.74 btu/h	2456.74 btu/h
Power Factor	$\geq 96\%$	$\geq 96\%$
Spectrum	4 Adjustable Spectrum Channels	Full Spectrum with UV, plus separate individual Far Red Channel
LED diodes	3326 diodes	2654 diodes
Mounting Height	> 2.5ft Above Canopy	> 2.5ft Above Canopy
Control System	256 Fixtures/ Channel Ultimate Controllability on UV, White, Deep Red and Far Red Channels	256 Fixtures / Channel Full Spectrum Plus individual Far Red
Lifetime	L90 > 54,000hrs	L90 > 54,000hrs
IP Rating	IP66	IP66
ETL Listed	✓	✓
DLC Listed LED	✓	✓
Dimensions	45.24"L x 4.36"W x 6.46"H	45.24"L x 4.36"W x 6.46"H
Weight	22.33 lbs	22.33 lbs
Warranty	5 Years Standard Warranty	5 Years Standard Warranty

What is the Smart Light Lifter System?

The ThinkGrow Smart Light Lifter System is ETL listed and is designed to raise and lower LEDs with the press of a button or by setting a schedule in advance using a TrolMaster HCS controller. The System is engineered to be a modular design, allowing multiple lifters to be synchronized together by daisy-chaining them. It consists of a Light Lifter (LLT-1) and a Lifter Remote Control (LRC-1). Each lifter can lift up to 132 lbs, 8.8ft in the air. This is accomplished by using precision-controlled motorized

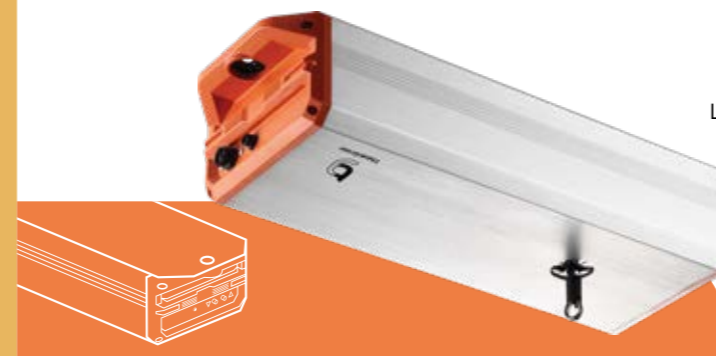
lifting assemblies with individual precision positioning transducers. The easily expandable modular lifter system provides user customization, which means users have maximum flexibility on both weight-bearing requirements and lighting layout, by simply changing the number of the modular lifting units. ThinkGrow always cares about how growers optimize their grow room and achieve higher yields with the greatest efficiency possible.



Smart Light Lifter System



Smart Light Lifter System



Lifter-group Control



Spray Mode



Automatic Precision Synchronization



Modular Design



Intelligent Advanced Control



ThinkGrow Smart Light Lifter (LLT-1)

The LLT-1 light lifter is part of the ThinkGrow Smart Light Lifter system. Its cutting-edge synchronized multi-lifter operation provides users with a **customizable, expandable and easy-to-install system**. The light lifter design enables easy, two-man installation. Users can effortlessly adjust the height of the entire grow room's light fixtures at the perfect height level with the touch of a button. It reduces assembly time and installation manpower without compromising quality or safety.

Specifications

Voltage :	110-240 V, 50/60 Hz
Power :	≤100W
Certifications :	ETL Listed
Dimensions :	20.9" L x 7.29" W x 4.17" H
Weight :	22.7lbs
Temperature :	32-104° / 0-40°C
Humidity :	≤90%
Lifting Range :	≤ 8.8 ft / 2.7 m / 106 inches
Maximum Lifting Weight :	≤ 132 lbs / 60 kg

Smart Features

When using the TrolMaster Hydro-X Pro controller with the Light Lifter System



The Spray Mode:

The Spray Mode is another advanced feature on the Hydro-X Pro controller which allows users to temporarily change the grow room environment during the foliar or pesticide spraying operation. Sometimes growers need to spray their crops. Spraying can be harmful to electronics including LED lights. With the Hydro-X Pro Spray Mode, the users can set up a simple subroutine and adjust the LEDs to move up to a custom height level to protect the LED fixtures from being sprayed. When the spray operation is completed, all settings on the Hydro-X Pro will automatically revert to the initial conditions and the fixtures will be lowered back to their original height, mitigating the risk of human error potentially damaging the LED systems.

Smart Lifter Remote (LRC-1)

The LRC-1 Smart Lifter Remote is designed to be used with the LLT-1 Smart Light Lifters. Its plug & play feature enables users to easily install and operate the light lifter(s) from a distance, and program the maximum and minimum range limits of LLT-1 light lifters. **Simple Up and Down** manual operation is accomplished using two push buttons on the LRC-1. The LRC-1 Lifter Remote can also be connected with the TrolMaster **Hydro-X Pro controller** for advanced features such as lifter-group control and more. When the LRC-1 is paired with the Hydro-X Pro, users can conveniently and smoothly control each individual lifter group or all groups together on one main controller. Each LRC-1 controls a group of lifters. Users can program the height range setting in each group and precisely raise and lower the multiple fixtures in each lifter group with the press of a button.

Specifications

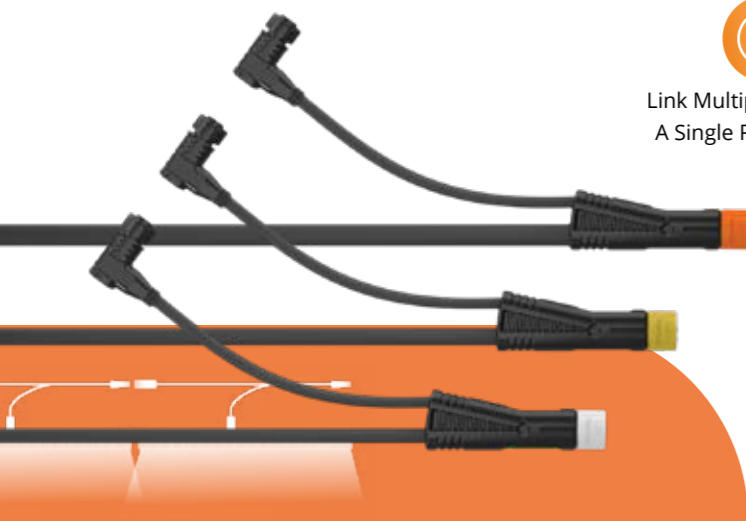
Voltage :	110-240 V, 50/60 Hz
Amperage :	0.1A
Certifications :	ETL Listed
Dimensions :	2.56" L x 5.52" W x 1.97" H
Weight :	0.66 lbs
Temperature :	32-104° / 0-40°C
Humidity :	≤90%



Scheduled Auto-lifting:

Scheduled Auto-lifting is one of the new advanced features when using the Hydro-X Pro controller with the Light Lifter System. The System is engineered to seamlessly integrate into this feature. Users can easily raise the LEDs and adjust the lifting schedules according to their needs on the Hydro-X Pro controller. The ideal distance between the LED lights and the plant canopy will be maintained automatically by raising the lights as the plants grow taller.

5' Daisy Chain Power Cord



Link Multiple Fixtures to A Single Power Source



Simple & Clean Installation



First and Only ETL-certified



Minimizes Infrastructure Cost

5' Daisy Chain Power Cord

The DCA-10/12/14 are 5' long AWG#10/12/14 AWG Daisy-Chain Power Cords for all ThinkGrow LEDs, designed to **interconnect multiple LED drivers** to a single power source, the system can **eliminate a massive amount of power outlets**, and **reduce the number of power cables required**. Depending on the power source of your facility, and the model of ThinkGrow LEDs you are using, the daisy-chain power cables can provide power to up to as many as 36 LED lighting fixtures.



DCA-10
AWG #10

Specifications

Input Voltage :	100-277V=≤30A
Gauge :	10 AWG
Copper Area :	5.26 mm ²
Resistivity :	< 12 mΩ
Length :	5 ft (1.5 m)
Weight :	1.70 lbs (770 g)



DCA-12
AWG #12

Specifications

Input Voltage :	100-277V=≤20A
Gauge :	12 AWG
Copper Area :	3.31 mm ²
Resistivity :	< 12 mΩ
Length :	5 ft (1.5 m)
Weight :	1.24 lbs (560 g)



DCA-14
AWG #14

Specifications

Input Voltage :	100-277V=≤15A
Gauge :	14 AWG
Copper Area :	2.08 mm ²
Resistivity :	< 21 mΩ
Length :	5 ft (1.5 m)
Weight :	1.06 lbs (480 g)

#10 AWG Maximum number of LEDs that can be connected

LED Model	Input Power	Input Voltage			
		120 Volts	240 Volts	277 Volts	480 Volts
Model-I Plus	720 Watt	4	8	9	16
Model-I	720 Watt	4	8	9	16
Model-H Plus	720 Watt	4	8	9	16
Model-H	630 Watt	4	9	10	18
Model-W	630 Watt	4	9	10	18
Model-V	350 Watt	9	18	20	36

ThinkGrow #10 AWG cables are rated up to 30-amps.

#12 AWG Maximum number of LEDs that can be connected

LED Model	Input Power	Input Voltage			
		120 Volts	240 Volts	277 Volts	480 Volts
Model-I Plus	720 Watt	2	5	6	10
Model-I	720 Watt	2	5	6	10
Model-H Plus	720 Watt	2	5	6	10
Model-H	630 Watt	3	6	7	12
Model-W	630 Watt	3	6	7	12
Model-V	350 Watt	6	12	14	24

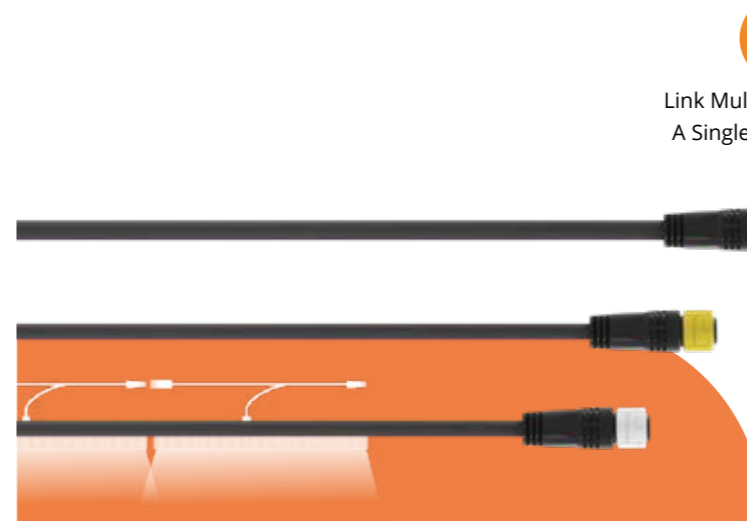
ThinkGrow #12 AWG cables are rated up to 20-amps.

#14 AWG Maximum number of LEDs that can be connected

LED Model	Input Power	Input Voltage			
		120 Volts	240 Volts	277 Volts	480 Volts
Model-I Plus	720 Watt	2	4	4	8
Model-I	720 Watt	2	4	4	8
Model-H Plus	720 Watt	2	4	4	8
Model-H	630 Watt	2	4	5	9
Model-W	630 Watt	2	4	5	9
Model-V	350 Watt	4	9	10	18

ThinkGrow #14AWG cables are rated up to 15-amps.

Extension Power Cord



Link Multiple Fixtures to A Single Power Source



Simple & Clean Installation



First and Only ETL-certified



Minimizes Infrastructure Cost

Extension Power Cord

The DEA-10/12/14 are 3' long 10/12/14 AWG Daisy-Chain Extension Power Cords for all ThinkGrow LEDs. They are designed to **extend the length** of the Daisy-Chain Power Cord, to allow fixtures to be positioned further apart.

The DEA-10L is a 10' Daisy-Chain Extension Power Cord to extend the power cord cable to interconnect between LED drivers to reduce power outlets and infrastructure costs.



DEA-10L
AWG #10

Specifications

Input Voltage :	100-277V=≤30A
Gauge :	10 AWG
Copper Area :	5.26 mm ²
Resistivity :	< 17 mΩ
Length :	10 ft (3 m)
Weight :	2.56 lbs (1160 g)



DEA-10
AWG #10

Specifications

Input Voltage :	100-277V=≤30A
Gauge :	10 AWG
Copper Area :	5.26 mm ²
Resistivity :	< 12 mΩ
Length :	3 ft (0.9 m)
Weight :	0.93 lbs (420 g)



DEA-12
AWG #12

Specifications

Input Voltage :	100-277V=≤20A
Gauge :	12 AWG
Copper Area :	3.31 mm ²
Resistivity :	< 16 mΩ
Length :	3 ft (0.9 m)
Weight :	0.67 lbs (300 g)



DEA-14
AWG #14

Specifications

Input Voltage :	100-277V=≤15A
Gauge :	14 AWG
Copper Area :	2.08 mm ²
Resistivity :	< 21 mΩ
Length :	3 ft (0.9 m)
Weight :	0.53 lbs (240 g)

#10 AWG Maximum number of LEDs that can be connected

LED Model	Input Power	Input Voltage			
		120 Volts	240 Volts	277 Volts	480 Volts
Model-I Plus	720 Watt	4	8	9	16
Model-I	720 Watt	4	8	9	16
Model-H Plus	720 Watt	4	8	9	16
Model-H	630 Watt	4	9	10	18
Model-W	630 Watt	4	9	10	18
Model-V	350 Watt	9	18	20	36

ThinkGrow #10 AWG cables are rated up to 30-amps.

#12 AWG Maximum number of LEDs that can be connected

LED Model	Input Power	Input Voltage			
		120 Volts	240 Volts	277 Volts	480 Volts
Model-I Plus	720 Watt	2	5	6	10
Model-I	720 Watt	2	5	6	10
Model-H Plus	720 Watt	2	5	6	10
Model-H	630 Watt	3	6	7	12
Model-W	630 Watt	3	6	7	12
Model-V	350 Watt	6	12	14	24

ThinkGrow #12 AWG cables are rated up to 20-amps.

#14 AWG Maximum number of LEDs that can be connected

LED Model	Input Power	Input Voltage			
		120 Volts	240 Volts	277 Volts	480 Volts
Model-I Plus	720 Watt	2	4	4	8
Model-I	720 Watt	2	4	4	8
Model-H Plus	720 Watt	2	4	4	8
Model-H	630 Watt	2	4	5	9
Model-W	630 Watt	2	4	5	9
Model-V	350 Watt	4	9	10	18

ThinkGrow #14AWG cables are rated up to 15-amps.

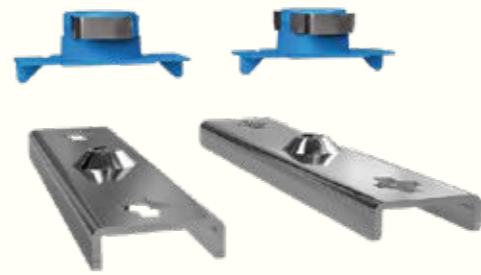
Smart Junction Box

Smart Junction Box (OPA-1)



For added safety and convenience, ThinkGrow has also developed a Smart Junction Box (OPA-1) to incorporate with our daisy-chain power cord system. It has an electronic circuit breaker connected with each "string" of LEDs to monitor and protect the circuit from power overload. If the circuit protector detects unusual high amperage, the power to the LEDs will be turned off to prevent damage to the LEDs and the daisy-chain cables. It also offers real-time monitoring and data logging for energy consumption, voltage and power factor.

Accessories



UH-1
(for Multiple-bar LEDs - Model-H Plus/H/W/V)



UH-2
(for Single-bar LEDs - Model-I / I Plus)

Unistrut Hangers (UH-1 & UH-2)

The UH-1 & 2 Unistrut Hangers are designed for low ceiling installation with standard 1-5/8" Metal Framing Channels (Unistrut). It comes with a quick-release design and is compatible with ThinkGrow LEDs.

Accessories

12' Power Extension Cord (EC-12)

The EC-12 Power Extension Cord is a 12' power extension, inline cord with push lock connectors used to extend the length of the standard power cable for all ThinkGrow fixtures.



EC-277

277V Power Cord 12 (EC-277)

The EC-277 Power Cord is a 12', 277V power cord with NEMA L7-15P Plug for all ThinkGrow fixtures.

12' Daisy Chain Control Cable (ECS-7)



16ft 4-Pin Waterproof Extension Cable (ECS-6)

The ECS-6 Data Extension cable is a 16' data extension cable with 4 pins. It can be used to extend the ECS-9 cable that comes with the LMA-T or to extend the 4-pin data daisy chain cables for interconnecting the ThinkGrow fixtures (ECS-7).

Designed to daisy-chain (interconnect) multiple LEDs to the TrolMaster controller. One ECS-7 cable is provided with all ThinkGrow LEDs including Model-I/ Model-I Plus, Model-H, Model-W and Model-V LEDs. Note: This is a replacement or spare part.



12ft RJ12 to 4-Pin IP65 Connector Cable (ECS-9)

The ECS-9 Data cable is a 12ft / RJ12 to 4-pin IP65 connector cable for connecting TrolMaster LMA-T lighting control adapter and ThinkGrow LED. It can also be used to connect multiple fixtures to a splitter hub (SPH-1). Note: The ECS-9 cable comes as part of the LMA-T lighting adapter. Additional ECS-9 cables can be used to allow the user to customize their LED low-voltage cables to best suit their needs.



UV-1

ThinkGrow UV Light Bar for Model-H / W (UV-1)

The UV-1 light bar is designed to be used on the Model-H/W. It adds a specific portion within the UVB spectrum band to mimic the properties of natural sunlight by adding a small amount of UVB chips, to the LED light bar. A small amount of UV light will increase terpene and oil production, which improves the smell and flavor of herbs. One UV-1 bar produces 70 watts of full spectrum light plus 10 watts of supplemental UV light. It is recommended to swap two bars for a 4'x 4' or 5'x5' coverage in the last 4-6 weeks of the flowering cycle.



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