

# Agriculture/ Farming

*The OEM and Installers Guide  
to Control Components  
for Agricultural Equipment*





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# About c3controls

Since 1976 c3controls ([c3controls.com](https://c3controls.com)) has provided OEMs and electrical equipment builders a comprehensive portfolio of industrial control products that meet the most demanding applications. By maintaining strict control over the development and manufacturing of all products, c3 can provide customers extraordinary value through unmatched quality, competitive pricing, same-day shipping and a lifetime product warranty. This vertically integrated approach coupled with a direct sales model brings c3 closer to the end-user, fostering a degree of innovation that leads the industry.



We are proud to be ISO 9001:2015 certified for our quality management system.

# Glossary of Terms

**Agriculture/Farming:**  
The practice of cultivating soil, growing crops, and raising livestock to produce food, fiber, and other products.

**Baler:**  
A machine that compresses and bundles hay, straw, or silage into compact bales for easy storage and transport.

**Biomass Energy:**  
Renewable energy derived from organic materials like crop residues, manure, and wood, used for fuel and electricity generation.

**Combine:**  
A large harvesting machine that cuts, threshes, and separates grains from crops like wheat, corn, and soybeans in a single process.

**Drones:**  
Unmanned aerial vehicles used in agriculture for crop monitoring, spraying, mapping, and data collection to improve farm efficiency.

**Harvesting:**  
The process of collecting mature crops from the field. Combines, mowers, balers, and windrowers are commonly used for different crop types.

**Irrigation System:**  
A structured method for delivering water to crops. Common types include drip irrigation (slow, targeted watering), sprinkler systems (simulating rainfall), and center pivot systems (rotating sprinklers over large fields).

**Mower:**  
A machine used to cut grass, hay, and cover crops, often used in hay production.

**Planter:**  
A machine designed to plant seeds at precise intervals and depths, commonly used for row crops like corn and soybeans.

**Plowing:**  
The process of turning over soil to prepare it for planting. Common plows include moldboard, chisel, and disc plows, which are often pulled by tractors to break up soil and improve aeration.

**Precision Farming:**  
The use of GPS, sensors, and data analytics to optimize crop planting, fertilization, and irrigation for increased efficiency and reduced waste.

**Pump:**  
A device that moves water through irrigation systems, ensuring crops receive adequate moisture. Pumps vary in size and type, depending on the farm's water source and irrigation method.

**Seeding:**  
Planting seeds in the soil using machinery like seeders, drills, and planters, ensuring proper depth and spacing for optimal crop growth.

**Spreader:**  
A machine that distributes materials such as fertilizers, lime, and seeds evenly across a field, improving soil nutrients and crop health.

**Sprayer:**  
Equipment used to apply pesticides, herbicides, and fertilizers to crops, ensuring even distribution and efficient crop protection.

**Tillage:**  
The process of preparing soil for planting by breaking up compacted earth, controlling weeds, and incorporating crop residues. Tools such as cultivators, harrows, and disc plows are used for tillage.

**Tractor:**  
A powerful vehicle used to pull and operate various types of farm machinery, including plows, seeders, sprayers, and balers.

**Watering:**  
Providing water to crops through irrigation systems, which include drip irrigation, sprinkler irrigation, and center pivot irrigation. These systems help maintain soil moisture and support plant growth.

**Windrow:**  
A long row of cut crops left to dry before being baled or collected.

**Windrower:**  
A machine that cuts and arranges crops into windrows (rows of cut crops) to dry before baling or harvesting.

**Yield:**  
The amount of crop produced per unit of land, a key measurement of farm productivity.

# Agriculture/Farming Overview

The agriculture and farming industry is at the heart of U.S. food production, continuously evolving to meet the demands of a growing population. As technology advances, farmers and manufacturers are embracing new innovations that enhance efficiency, sustainability, and productivity. The integration of precision farming, automation, and environmentally friendly machinery is shaping the future of modern agriculture, allowing farmers to produce more while using fewer resources.

While rising interest rates have made it more challenging for farmers to finance new equipment, the industry remains resilient. With expected improvements in economic conditions, access to financing is anticipated to become more favorable, allowing farmers to invest in the latest machinery that improves yields and operational efficiency. Smart farming technologies, including GPS-guided tractors, drones, and automated irrigation systems, are already transforming agriculture by optimizing resource use and reducing costs. Manufacturers are meeting this demand with cutting-edge equipment that helps farmers make data-driven decisions and maximize productivity.

The push for sustainability and energy efficiency is also driving exciting changes. The development of electric and hybrid farm equipment is making operations cleaner and more cost-effective, aligning with efforts to reduce fuel consumption and emissions. As these technologies continue to improve, farmers will benefit

from lower operating costs and increased long-term savings. While challenges such as fluctuating crop prices and supply chain disruptions persist, the industry's future remains bright and is well-positioned to thrive in the years ahead, ensuring a more productive and efficient future for American farmers.

c3controls is helping overcome the evolving demands of the industry. For almost 50 years, c3controls has specialized in manufacturing high-quality electrical controls for agricultural systems. Vertical integration allows us to operate more efficiently and respond to market conditions quicker. That means lightning quick delivery for products supporting:

- **Plowing**
- **Seeding**
- **Watering**
- **Harvesting**
- **& more!**

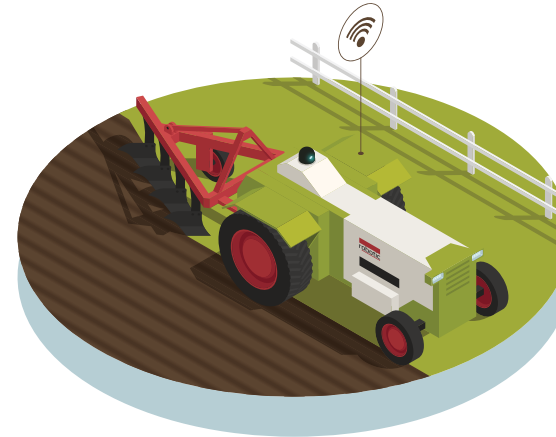
With over seventeen million product configurations and a complete UL508A panel shop, c3controls is ready to help you enhance productivity on the farm. Contact us today and discover how our controls can level up your agricultural operations!

# Agriculture/Farming Isometric

*c3controls delivers electrical controls that power all of your agricultural needs such as:*

## PLOWING

The process of turning over soil to prepare it for planting. Common plows include moldboard, chisel, and disc plows, which are often pulled by tractors to break up soil and improve aeration.



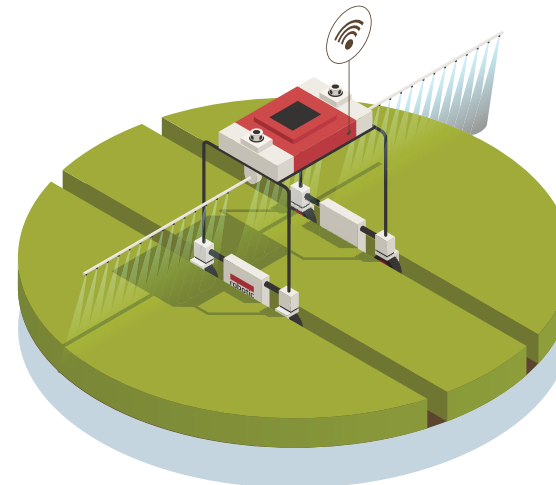
## SEEDING

Planting seeds in the soil using machinery like seeders, drills, and planters, ensuring proper depth and spacing for optimal crop growth.



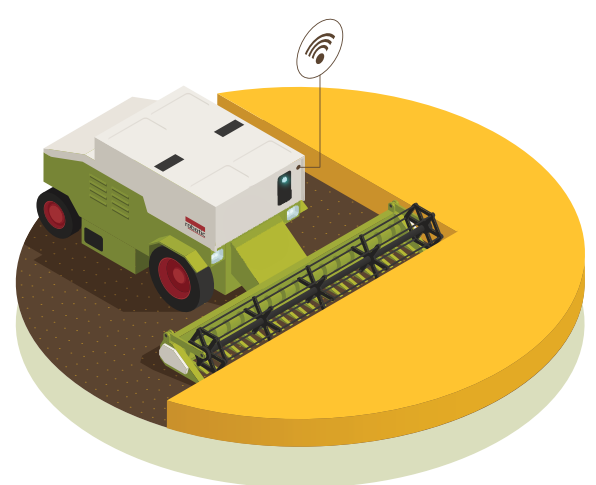
## WATERING

Providing water to crops through irrigation systems, which include drip irrigation, sprinkler irrigation, and center pivot irrigation. These systems help maintain soil moisture and support plant growth.



## HARVESTING

The process of collecting mature crops from the field. Combines, mowers, balers, and windrowers are commonly used for different crop types.





# Agriculture/Farming Products

## Pilot Devices



- Modular range of 30mm, 22mm, 16mm, 13mm, and cam-operated rotary switches
- Maintained and momentary operations in both non-illuminated, illuminated, and keyed versions
- Type 1, 2, 3, 3R, 4/4X, 12, and 13
- Color-coded, snap-on contact blocks
- Full voltage, multi-voltage, resistor, and dual input light units in a wide range of voltages up to 600VAC/VDC
- Cam switch operators are certified as Manual Motor Controllers per UL

## Control Stations (+ E-Stops)



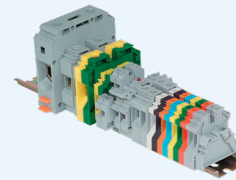
- Standard pre-configured assemblies of 30mm and 22mm pilot devices (customizable configurations available)
- Enclosure constructions in Polycarbonate, Polyester, and Die Cast Aluminum
- Operator options in both non-illuminated and illuminated
- Each assembly comes with laminated, laser engraved legend plates
- Fully assembled and ready to use out of the box

## Tower Lights



- Stackable design for up to 5 modules in a single assembly
- Mounting options in three styles: 50mm direct mount, 50mm panel-mount short base, and 50mm panel-mount tall base
- Voltage options available in 24V AC/DC, 120V AC, and 240V AC
- Three styles of illumination: continuous, flashing and rotary
- Continuous or intermittent sound modules with 80dB or 100dB sound output

## IEC Terminal Blocks



- Screw Clamp, Spring Clamp, and Miniature
- 5mm - 25mm widths
- 25 - 230 Amps
- Feed Through, Ground, Multi-Conductor, Double & Triple Level, Fuse Holder, Power Distribution, and more
- DIN Rail mounting; snap-on, snap-off assembly

## General Purpose Relays



- Octal Base with pin terminals and Square Base with blade-style terminals
- Various pole combinations and coil voltages
- Color-coded push buttons for distinguishing AC and DC
- Built-in retainer clips in relay sockets
- Marking plates on relays and sockets

## Electronic Timing Relays



- Compact design, sizes in 17.5mm, 22.5mm, and 45mm wide
- Single, dual and multi-functions
- Timing ranges from 0.01 seconds to 9,999 hours
- DIN Rail, Panel, Socket, and enclosure door mountings
- Voltage inputs 20-240 VAC and 12-240 VDC

## Disconnect Switches



- Door mount, panel-base mount, and panel mount with integral operator
- Certified for use in Manual Motor Controller applications suitable as Motor Disconnects
- 16 - 125 Amps in 3, 4, and 5 pole configurations
- Motor loads up to 40HP @ 480V (55kW @ 400V)
- Operating handles rated for Type 1, 2, 3, 3R, 4/4X, 12, 13, IP55, and IP65

## Miniature Circuit Breakers



- UL 489 & UL 1077
- 1, 2 and 3 Pole combinations
- 10kA SCCR @ 480Y/277VAC
- Current ratings up to 63 Amps
- B, C and D curve ratings

## Contactors and Control Relays



- Contactors: 9 to 105 Amps
- Contactors: 100kA SCCR @ 480V and 600V with Class J fuses
- Contactors: AC and DC - electronic coil control on DC devices
- Control Relays: Bifurcated contacts
- Control Relays: Rated 16A AC-1, A600, and Q600 for applications up to 600V

## Industrial Power Supplies



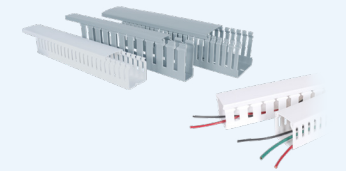
- Designed to deliver the power with up to 93% efficiency
- Adjustable voltage options in 12, 24 and 48V
- Output power range from 60W to 480W
- DC OK relay contacts are standard on 240W and 480W
- Compact design - 43mm wide, up to 60mm

## Control Power Transformers



- Open-type control transformers ranging from 50 to 5000VA
- Integrated terminal blocks and a finger-safe terminal guard, with IP20 protection on primary and secondary sides
- Each transformer variant features a Class H insulation system
- Capable of handling dynamic loads effectively, suitable for applications with fluctuating power demands
- Ability to provide multiple voltage outputs from a single unit

## Wire / Cable Duct



- 13 Selectable dimensions from 25mm wide up to 80mm, and up to 2m in length
- Narrow and Wide Slot
- Rigid "U" shaped duct with non-slip cover in gray or white
- Optional adhesive backing

## Overload Relays



- Available in five frame sizes with a current adjustment range of 0.28 - 112A
- High fault SCCR of 100kA @ 480V and 600V with Class J fuses
- Full load current adjustment ratio of approx. 1:1.5 enables relay to be set to exact FLA of motor
- Single phase sensitivity to protect motors against damaging phase loss conditions
- Manual or automatic reset and test modes, and stop button all in a single device

## Motor Protection Circuit Breakers



- Multi-Function: Manual Motor Controller, Motor Disconnect, Group Motor Installations
- 50kA SCCR @ 480V
- Self-protected Type E up to 50kA @ 460V
- FLC up to 32 Amps
- Trip Class 10 Thermal and Magnetic Elements

## Direct-On-Line Starters



- Open-style starters consist of either a Contactor & Overload Relay, or a Motor Protection Circuit Breaker & Contactor
- Enclosed starters come pre-wired with a variety of pilot device options
- Factory assemblies provide the convenience of a single catalog number and shorter control panel bill of material

## VFD Bypass Panels



- Can be installed as either a temporary replacement to a VFD or as a system backup
- Each assembly includes: fused disconnect switch, contactors, control transformer, a variety of 22mm IEC pilot devices, and power and control terminal blocks
- Optimized width to save wall space

## Electrical Panels



- Our UL508A certified panel shop excels in speciality panels from complete finished solutions to simple value-added projects.



# Product Portfolio

Our 17 million+ product configurations deliver durability and reliability—even in the most punishing environments—meeting and exceeding global standards for quality and safety.



**DISCONNECT SWITCHES**  
NON-FUSED & ENCLOSED



**MINIATURE CIRCUIT BREAKERS**



**CONTACTORS & CONTROL RELAYS**



**OVERLOAD RELAYS**



**DIRECT-ON-LINE STARTERS**  
CONTACTOR + OVERLOAD RELAY



**ENCLOSED DIRECT-ON-LINE STARTERS**  
CONTACTOR + OVERLOAD RELAY



**MOTOR PROTECTION CIRCUIT BREAKERS**  
OPEN & ENCLOSED



**DIRECT-ON-LINE STARTERS**  
MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR



**ENCLOSED DIRECT-ON-LINE STARTERS**  
MOTOR PROTECTION CIRCUIT BREAKER + CONTACTOR



**30MM PILOT DEVICES**  
FOR INDUSTRIAL & HAZARDOUS LOCATION



**22MM PILOT DEVICES**  
IEC & NEMA



**WORLD TOWER LIGHTS**



**CAM SWITCHES**



**16MM PILOT LIGHTS**



**13MM PILOT LIGHTS**



**CONTROL STATION ENCLOSURES**



**ENCLOSED UL508A COMBINATION MOTOR STARTERS**




**ENCLOSED POWER SUPPLIES**



**VFD BYPASS PANELS**




**INDUSTRIAL POWER SUPPLIES**




**CONTROL CIRCUIT TRANSFORMERS**



**CONTROL POWER TRANSFORMERS**



**TERMINAL BLOCKS**




**TERMINAL BLOCK RELAYS**



**ELECTRONIC TIMING RELAYS**




**GENERAL PURPOSE RELAYS**



**WIRING DUCT**

# White Papers

Product professionals AND subject experts!  
Check out c3controls' extensive library of white papers:



## Pump Control (Water/ Wastewater/ Irrigation)

Each application to control a pump is unique. Click here for the types of control methods and what to consider when selecting pump control.


[READ WHITEPAPER](#)



## Applying Motor Controls in a Pumping Application

Click here to learn more about the basic understanding of pump control for water and wastewater!

[READ WHITEPAPER](#)



## Replacing VFDs with Motor Starters

Learn about the benefits of replacing variable frequency drives (VFDs) with motor starters in certain applications.


[READ WHITEPAPER](#)



## Key Components of Industrial Control Panels

Discover the essential components of industrial control panels at c3controls, including switches, relays, circuit breakers, and more. Learn how these elements work together to ensure safe and efficient operation in industrial environments. Read now for more!


[READ WHITEPAPER](#)



## Are Fuses Actually Cheaper Than Circuit Breakers?

Discover the differences between MCBs (Miniature Circuit Breakers) and fuses and Arm yourself with knowledge for a secure and efficient electrical system. Make informed decisions for electrical safety.

[READ WHITEPAPER](#)



## How to Size a Disconnect Switch for Your Project

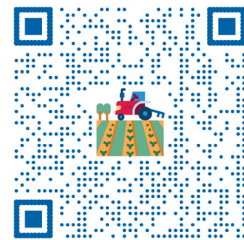
Is your project calling for a disconnect switch? Check out this guide to learn how to find the perfect fit disconnect switch for your needs.

[READ WHITEPAPER](#)





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*Everything under control.*