



Applications

- Meets the requirements of the following applications:
 - Air Handling Units
 - Chillers
 - Boilers
 - Cooling Towers
 - Heat-Exchangers
 - Pumps
 - Lighting Control
- Improves energy efficiency when combined with:
 - CO₂ sensors as part of a demand-controlled ventilation strategy that adjusts the amount of fresh air intake according to the number of building occupants
 - Variable-frequency drives to adjust motor speed according to the instantaneous demand of the application
- Works with a wide range of wireless battery-less sensors

Features & Benefits

- Use the EC-gfxProgram's state-of-the-art visual programming wizard to customize controller operation to meet specific engineering requirements. EC-gfxProgram is accessible in both Niagara^{AX} Framework-based and LNS-based software, allowing you to work with your preferred network management platform.
- Accelerate custom programming development by using pre-built HVAC control sequences supplied with EC-gfxProgram.
- Available with an optional Wireless Receiver that supports up to 28 wireless inputs, letting you create wire-free installations and use various wireless battery-less sensors and switches.
- LONMARK Static Programmable Device certified, guaranteeing interoperability with other manufacturers' LONMARK certified controllers.
- With 10 software configurable universal inputs and 8 software configurable universal outputs, this controller covers all small to medium-size industry-standard HVAC applications. Four of these inputs also support fast pulse count reading up to 50 Hz frequency for gas, water, and electric meters.
- 0-20mA inputs and outputs have a jumper that eliminates the need for external resistors.
- Highly accurate universal inputs support thermistors and resistance temperature detectors (RTDs) that range from 0 Ohms to 350 000 Ohms, giving you the freedom of using your preferred or engineer-specified sensors, in addition to any existing ones.
- Rugged hardware Inputs and Outputs eliminate need for external protection components, such as diodes for 12V DC relays.

Overview

The **ECL-300 Series** are microprocessor-based programmable controllers designed to control equipment such as air handling units, chillers, boilers, pumps, and cooling towers. The ECL-300 series can also be used for lighting control and power measurement applications. This controller uses the LonTalk® communication protocol and is LONMARK certified as a Static Programmable Device, guaranteeing compatibility and interoperability with other manufacturers' LONMARK certified controllers.

This series contains two models as follows: ECL-300 and ECL-350. The ECL-300 series models have universal inputs and outputs that are ideal for controlling a wide range of HVAC equipment. The ECL-350 model has a full-color backlit-display and a jog dial for turn and select navigation to access a wide range of internal controller functions: view, edit, and override values, tune PID loops with system response graphing, view schedule status, and view connection and communication alarms.

These controllers work with a wide range of sensors, such as those in the Allure™ EC-Smart-Vue series of communicating room sensors that feature a backlit-display and graphical menus. These sensors are used for indoor temperature measurement, setpoint adjustment, fan speed selection, and occupancy state override. In addition, this controller is Open-to-Wireless™ ready, and when paired with the Wireless Receiver, it works with a variety of wireless battery-less sensors and switches.

Custom program this controller using EC-gfxProgram through either EC-Net^{AX} Pro which is powered by the Niagara^{AX} Framework® or through any LNS-based software such as Distech Controls' Lonwatcher 3. This allows you to quickly and easily create your own control sequences capable of meeting the most demanding requirements of any engineering specification.

ECL-300 Series Controllers



| Model | ECL-300 | ECL-350 |
|---|---------------------|--|
| Points | 18-Point Controller | 18-Point Controller with Color Display |
| Universal hardware inputs | 10 ¹ | 10 ¹ |
| Allure EC-Smart-Vue ² | 12 | 12 |
| Wireless inputs ³ | 28 | 28 |
| 15 Vdc Power Supply | ■ | ■ |
| Universal outputs | 8 | 8 |
| Operator interface: interactive color display to monitor and override controller parameters | | ■ |

1. The first four inputs are software configurable for pulse counting up to 50 Hz and are compatible with an S0 rated (optically-isolated) output.
2. A controller can support a maximum of two Allure EC-Smart-Vue models equipped with a CO₂ sensor. The remaining connected Allure EC-Smart-Vue models must be without a CO₂ sensor.
3. All controllers are Open-to-Wireless ready. Available when an optional Wireless Receiver is connected to the controller. Some wireless sensors may use more than one wireless input from the controller.

Recommended Applications

| Model | ECL-300 | ECL-350 |
|-------------------|---------|---------|
| Air Handling Unit | ■ | ■ |
| Chiller | ■ | ■ |
| Boiler | ■ | ■ |
| Cooling Tower | ■ | ■ |
| Pumps | ■ | ■ |

Additional Features & Benefits for the ECL-350 Model



The ECL-350 has a large color backlit-display that allows an operator to have immediate access to internal controller data.

- View, edit, and override values. The status is color coded to show if the value is in alarm or overridden.
- Visually tune PID loops with system response graphing.
- View active connection and communication alarm list.
- Create a list of favorites to provide quick access to commonly-used values.
- Multi-User access management.
- Multilingual interface: English, French, German, etc.

Open-to-Wireless Series – Controller Wireless Receiver Add-on



To reduce the cost of installation, and minimize the impact on existing partition walls, the Wireless Receiver enables these controllers to communicate with a line of wireless battery-less room sensors and switches. These Wireless Receivers are available in EnOcean 315MHz and 868.3MHz versions.

Note that controllers have one wireless port to support a single Wireless Receiver.

For more information about the EnOcean and Open-to-Wireless technologies, refer to the Open-to-Wireless Solution Guide. For more information about the Wireless Receiver module, refer to the [Wireless Receiver Datasheet](#). These documents can be found on our web site.

Supported Platforms



EC-Net^{AX} Solution

The EC-Net^{AX} multi-protocol integration solution is web-enabled and powered by the Niagara^{AX} Framework, establishing a fully Internet-enabled, distributed architecture for real-time access, automation and control of devices. The EC-Net^{AX} open framework solution creates a common development and management environment for integration of LONWORKS[®], BACnet[®] and other protocols. Regardless of manufacturer and protocol, the EC-Net^{AX} system provides a unified modeling of diverse systems and data, providing one common platform for development, management and enterprise applications.

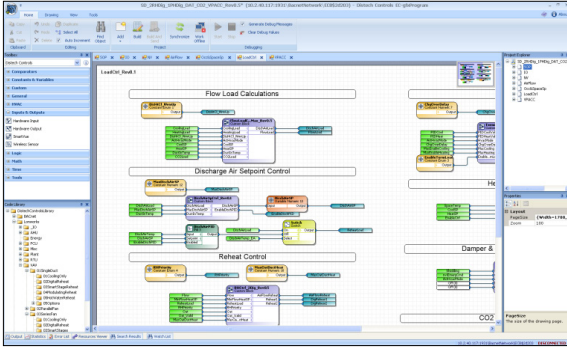
LONWORKS Network Services (LNS)



The LNS[®] client-server platform allows multiple users, running different LNS-compatible applications, to access a common source for directory, installation, management, monitoring and control services for the network system being managed. Distech Controls' Lonwatcher is an example of a LNS-based network management tool that can use Plug-Ins to configure and monitor controllers and devices in the control system.

EC-Net^{AX} Wizards and LNS Plug-Ins

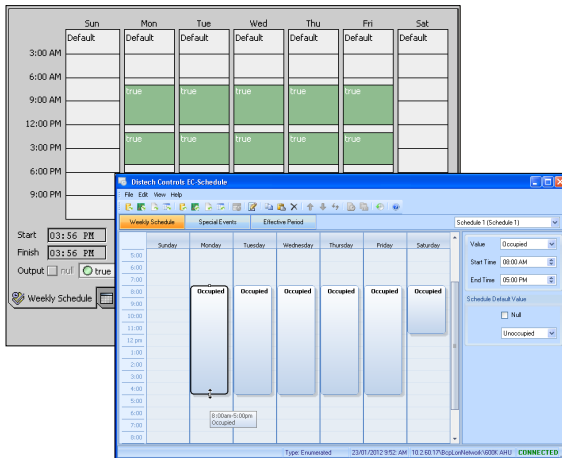
EC-gfxProgram Graphical Programming Interface (GPI)



Distech Controls' EC-gfxProgram is a programming tool that allows you to quickly create control sequences by "dragging and dropping" block objects and then linking the objects with a simple "click, select and release". Select objects from an extensive library of over 100 commonly used functions as well as create your own custom blocks. With a user-friendly interface and intuitive programming environment, HVAC programming could not be easier. Refer to the EC-gfxProgram datasheet for more information.

- Program both ECP and ECL Series LONWORKS and ECB Series BACnet controllers with the same tool.
- Supplied as freeware – there are no associated licensing costs.
- Live debugging allows user to view code execution, input/output values and to detect errors in real-time.
- A code library for managing your favorite or most commonly used code or code sections.

EC-Net^{AX} Scheduling / EC-Schedule LNS Plugin / EC-gfxProgram EC-Schedule



Configure the controller's built-in schedules and holidays from the EC-Net^{AX} solution (ECB and ECL series controllers), LNS (ECL series controllers), or directly from within EC-gfxProgram (ECB and ECL series controllers) with an easy-to-use point, drag, and click interface. It features a weekly schedule for regular, repeating, events by "time-of-day" and "day-of-week", while a holiday schedule is available to define events for specific days.

- Easily configure schedules using a graphical slider.
- Allows you to easily copy and paste entries. Duplicate a schedule entry for Monday to Friday.
- Special events allow you to set exceptions such as holidays to a schedule.
- Holidays can be set for recurring events such as the 9th day, or the 3rd Thursday of a given month.
- A schedule has an effective period during which it is active.
- Schedule provides Next State and Time to Next State that are ideal for use with programming functions such as Optimum Start or Morning Warm Up.

Complementary Products

Temperature Sensors

Allure EC-Smart-Vue Series



Line of communicating room temperature sensors with communication jack, a backlit-display and configurable graphic menus that allow occupants to set occupancy, setpoint adjustment, fan speed, or any other system parameters. Models are available with any combination of the following options: humidity sensor, motion sensor, and CO₂ sensor. The ECO-Vue™ icon (🌿) shows how environmentally-friendly the zone's energy consumption is in real time.

Allure EC-Sensor Series



Line of discrete temperature sensors. Models are available with the following options: communication jack, occupancy override button, setpoint adjustment, and fan speed selection.

Open-to-Wireless Sensors and Switches

Allure Wireless Battery-less ECW-Sensor Series



Line of wireless, battery-less room temperature sensors. Models are available with the following options: occupancy override button, setpoint adjustment, and fan speed selection.

These sensors are available in EnOcean 315MHz and 868.3MHz versions. The controller must be equipped with a [Wireless Receiver](#).

Wireless Sensors and Switches



A wide range of self-powered wireless sensors and switches, including the following: motion detector and light sensor, 2-/4-channel wireless light switches (North American and European models), outdoor temperature sensor, surface temperature contact sensor, duct temperature sensor, and more.

These sensors are available in EnOcean 315MHz and 868.3MHz versions. The controller must be equipped with a [Wireless Receiver](#).

For more information about the available wireless sensors and switches, refer to the [Open-to-Wireless Solution Guide](#) which can be found on our web site.

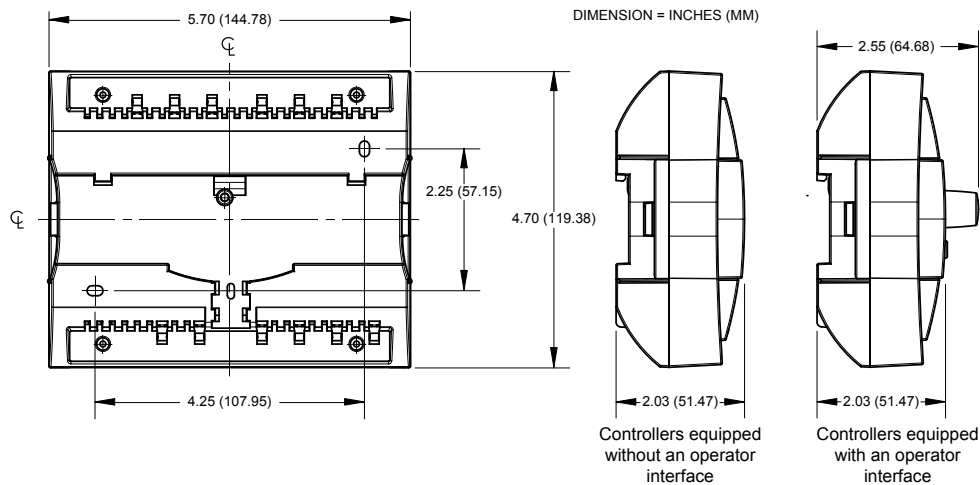
Relay and Relay Base



A SPDT (NO/NC) dry contact relay with a 12VDC coil. This relay's low-power coil allows a controller's universal output to control high-power loads. Optional hardware available includes a din-rail mountable socket base and a red LED for relay status indication.

For more information on these or other Distech Controls products, refer to our web site.

Controller Dimensions



Product Specifications

Power

| | |
|-------------------|---|
| Voltage | 24VAC/DC; $\pm 15\%$; 50/60Hz; Class 2 |
| Protection | 3.0A user-replaceable fuse |
| Power Consumption | |
| - ECL-300 | 16 VA typical plus all external loads ¹ , 38 VA max. |
| - ECL-350 | 19 VA typical plus all external loads ¹ , 41 VA max. |

Interoperability

| | |
|-------------------------------------|---|
| Communication | LonTalk protocol |
| Transceiver | FT 5000 Free Topology Smart Transceiver |
| Channel | TP/FT-10; 78Kbps |
| LONMARK Interoperability Guidelines | Version 3.4 |
| Device Class | Static Programmable Device |
| LONMARK Functional Profile | |
| - Input objects | Open-Loop Sensor #1 |
| - Output objects | Open-Loop Actuator #3 |
| - Node object | Node object #0 |
| - Real Time Clock | Real Time Keeper #3300 |
| - Scheduler | Scheduler #20020 |
| - Calendar | Calendar #20030 |
| - Programmable Device | Static Programmable Device #410 |

Hardware

| | |
|-----------------------|--|
| Processor | STM32 (ARM Cortex™ M3) MCU, 32 bit |
| CPU Speed | 72 MHz |
| Memory | 1 MB Non-volatile Flash (applications) 2 MB Non-volatile Flash (storage) 96 kB RAM |
| Real Time Clock (RTC) | Built-in Real Time Clock with rechargeable battery Network time synchronization is initially required |
| RTC Battery | 20 hours charge time, 20 days discharge time Up to 500 charge / discharge cycles |
| Status Indicator | Green LEDs: power status & LAN TX Orange LEDs: service & LAN RX |
| Communication Jack | LON® mono audio jack |

Environmental

| | |
|-----------------------|------------------------------|
| Operating Temperature | 32°F to 122°F; 0°C to 50°C |
| Storage Temperature | -4°F to 122°F; -20°C to 50°C |
| Relative Humidity | 0 to 90% Non-condensing |

1. External loads must include the power consumption of any connected modules such as an Allure EC-Smart-Vue. Refer to the respective module's datasheet for related power consumption information.

Inputs

| | |
|---------------------|---|
| Input Types | Universal; software configurable |
| -Voltage | - 0 to 10VDC (40k Ω input impedance) - 0 to 5VDC (high input impedance) |
| -Current | 0 to 20mA with 249 Ω jumper configurable internal resistor |
| -Digital | Dry contact |
| -Pulse | UI1 to UI4: 50Hz maximum; Min 10ms On/10ms Off - SO output compatible UI5 to UI10: 1Hz maximum; Min 500ms On/500ms Off - Dry contact |
| -Resistor | 0 to 350 K Ω . All thermistor types that operate in this range are supported. The following temperature sensors are pre-configured: |
| <i>Thermistor</i> | 10K Ω Type 2, 3 (10K Ω @ 77°F; 25°C) |
| <i>Platinum</i> | Pt1000 (1K Ω @ 32°F; 0°C) |
| <i>Nickel</i> | RTD Ni1000 (1K Ω @ 32°F; 0°C) RTD Ni1000 (1K Ω @ 69.8°F; 21°C) |
| Input Resolution | 16-bit analog / digital converter |
| Power Supply Output | 15VDC; maximum 200mA (10 inputs \times 20mA each) |

Outputs

| | |
|-------------------|---|
| Universal | Linear (0-10VDC) Digital (on/off), PWM, or floating (0 - 12VDC) 0-20mA (jumper configurable); software configurable Built-in snubbing diode to protect against back-EMF, for example when used with a 12VDC relay. - PWM control: adjustable period from 2 to 65sec. - Floating control: - Min pulse on/off: 500msec. - Adjustable drive time period - 60mA maximum @ 12VDC (140°F; 60°C) |
| Load resistance | - Minimum 200 Ω for 0-10VDC and 0-12VDC outputs - Maximum 500 Ω for 0-20mA output |
| Auto-reset fuse | - 60mA @ 140°F; 60°C - 100mA @ 68°F; 20°C |
| Output Resolution | 10-bit digital / analog converter |

Product Specifications (continued)

Enclosure

| | |
|-----------------|--|
| Material | FR/ABS |
| Color | Black & blue casing & grey connectors |
| Dimensions | |
| - ECL-300 | 5.7 W × 4.7 H × 2.03" D (144.78 × 119.38 × 51.47mm) |
| - ECL-350 | 5.7 W × 4.7 H × 2.55" D (144.78 × 119.38 × 64.68mm) |
| Shipping Weight | |
| - ECL-300 | 0.97lbs (0.44kg) |
| - ECL-350 | 1.08lbs (0.49kg) |

Wireless Receiver¹

| | |
|--|--|
| Communication | EnOcean wireless standard |
| Number of wireless inputs ² | 28 |
| Supported Wireless Receivers | Wireless Receiver (315) Wireless Receiver (868) |
| Cable | Telephone cord |
| - Connector | 4P4C modular jack |
| - Length | 6.5ft; 2m |

Standards and Regulation



| | |
|--------------|--|
| CE -Emission | EN61000-6-3: 2007; Generic standards for residential, commercial and light-industrial environments |
| -Immunity | EN61000-6-1: 2007; Generic standards for residential, commercial and light-industrial environments |
| FCC | This device complies with FCC rules part 15, subpart B, class A |



| | |
|-----------------------|---|
| UL Listed (CDN & US) | UL916 Energy management equipment |
| Material ³ | Plastic housing, UL94-5VB flammability rating Plenum rating per UL1995 |



CEC Appliance Database Appliance Efficiency Program⁴

1. Available when an optional external Wireless Receiver module is connected to the controller. Refer to the Open-to-Wireless Solution Guide for a list of supported EnOcean wireless modules.
2. Some wireless modules may use more than one wireless input from the controller.
3. All materials and manufacturing processes comply with the RoHS directive  and are marked according to the Waste Electrical and Electronic Equipment (WEEE) directive .
4. California Energy Commission's Appliance Efficiency Program: The manufacturer has certified this product to the California Energy Commission in accordance with California law.

ECL-350 Display

| | |
|------------------------|--|
| Display Type | Backlit-color LCD |
| Display Resolution | 400 W × 240 H pixels (WQVGA) |
| Effective Viewing Area | 2.4 W × 1.4" H (61.2 × 36.7mm) 2.8" (71mm) diagonal |
| Menu Navigation | Jog dial turn and select navigation with Exit button |

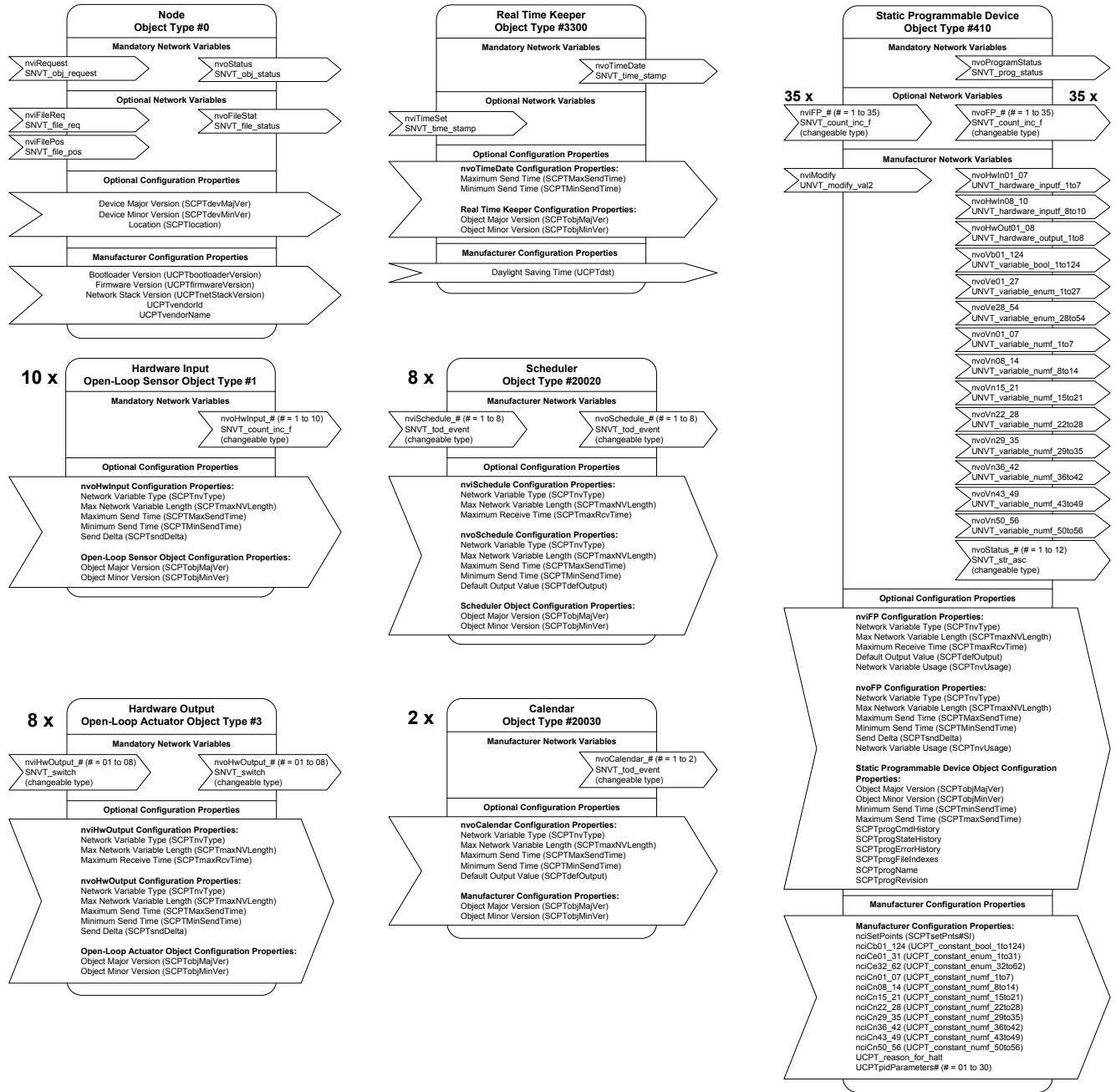
Allure EC-Smart-Vue

| | |
|----------------------------------|--|
| Communication | RS-485 |
| Number of sensors per controller | Up to 12, in daisy-chain configuration |
| Cable | Cat 5e, 8 conductor twisted pair |
| Connector | RJ-45 |

Communication Protocols



Functional Profile



Total Quality Commitment

All Distech Controls product lines are built to meet rigorous quality standards. Distech Controls is an ISO 9001 registered company.

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