

Control System DC CSD All Types

Technical Concept



Product Description

The DC Control System was designed for use with the following Exyte Technology filter fan units featuring DC motors:

- Filter fan unit, models: SILENT EC, ECO EC, LIGHT EC and COMPACT EC
- CWIC® system, models: EC and Hygiene EC
- Plenum integrated filter fan

The control electronics with bus interfaces are integrated into the fan unit and ready to plug in.

The speed of each fan unit can be adjusted individually, making it possible to adapt air speed to the requirements of each space and thus optimize overhead. Automatic monitoring and immediate reporting of any deviations in a simple language allow for a targeted, prompt response.

The network is clearly structured and almost entirely preassembled. The data bus wiring and network hardware, such as the repeater, can be installed and the entire system activated in no time at all.

The standard wiring with a preassembled, looped data bus inside the fan unit allows for quick assembly and makes alterations and extensions exceptionally simple. Assembly must undergo extremely stringent quality checks, thus ensuring superior levels of reliability in system operations.

Depending on the number of units and applications, the following control units can be used to manage a wide range of systems:

Control Units

Control Terminal



Figure. 1 Control Terminal with base station

Powered by a rechargeable battery, the Control Terminal is used to manage networks of up to 199 fan units and can be operated either alone or in conjunction with the base station. It is used to monitor and display information provided by the fan unit network. Should an error occur, the basis station is equipped with a potential-free relay contact [24 V (DC)/1 A].

The Control Terminal can be powered at all times using an external power plug or internal rechargeable batteries, which recharge when the terminal is plugged in. Once the batteries have achieved their full capacity, the charge controller terminates the charging process, thus preventing the batteries from overcharging.

With the option to connect an I/O module (eight inputs and eight outputs, power supply of 24 V), external control systems such as building management systems can be connected, allowing for external switching functions and signaling.

CRiSxt with pc workstation

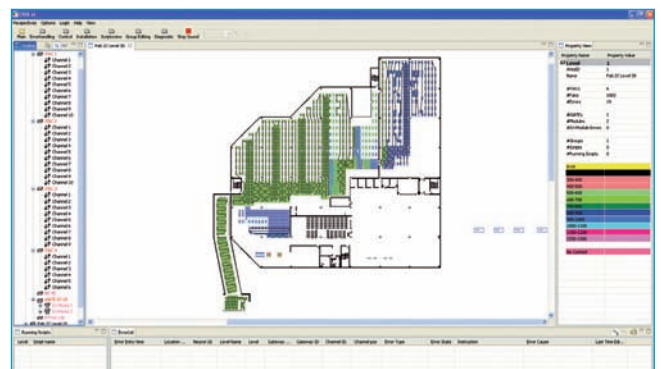


Figure. 2 Single view of the fan unit in the CRiSxt control system (screenshot)

The CRiSxt control system (including hardware and software) is used to manage and monitor networks of up to 70,000 units via LonWorks. Management, monitoring, operation, display and parameterization are carried out on a computer. Fan units along with room borders are illustrated as true-to-scale representations of cleanroom ceilings, walls and data bus paths across several rooms, the entire building or building levels – all in CAD quality.

The CRiSxt software was designed to manage the following functions:

- Monitoring and speed control of individual fan units or groups of fan units
- Manual control of individually selected fan units or groups of fan units
- Continuous ring query for monitoring fan units and network hardware

- Access authorization (password-protected) with date, time and user registration – Automatic logout following a specified amount of time
- Database in SQL format available
- Automatic synchronization of the dynamic illustration of graphic and table view
- Fan unit status display with changing colors
- Freely definable script function for a wide range of operation conditions, which can be activated automatically or manually or based on time or external standard signals (e.g. in case of a fire, smoke extraction, day/night reduction, etc.)
- Error reports appear in simple language and are archived (motor blocked, temperature error, speed deviation, etc.)
- Windows-oriented user interface with continuous true-to-scale cleanroom visualization
- Zoom and navigation via a flexible overview window
- Import of CAD files/layouts
- User languages: English, German
- Optional features:
 - OPC server
 - Uninterruptible power source (UPS)
 - Interface with building technology via I/O modules

Ultra Display

The Ultra Display is used to manage small networks of up to 63 fan units. External sensors (0–20 mA, 4–20 mA, 0–10 V) can be used to regulate the speed of an individual fan unit or groups of up to 63 fan units.

The Ultra Display features outputs required for forwarding error reports.

The Ultra Display was designed for integration into a control cabinet door or mounting on the wall. The power (24 V) can also be supplied from the control cabinet. Alternatively, the device can be mounted directly inside the fan unit or inside a partition. Exyte Technology offers ideal solutions.



Figure. 3 Ultra Display

Significant Characteristics

Control Electronics Integrated into the Fan Unit

The electronics do not need to be incorporated into the building structure itself, as the control electronics are already integrated into the fan unit casing.

Individual Control Systems

The control devices make it possible to manage, monitor, display, operate and parameterize fan units, even in complex systems featuring several thousand units.

Reducing Overhead

It is possible to adjust each fan unit individually and thus precisely adapt air speeds to the requirements of each area, resulting in reduced overhead.

Saving Time

The network and its components are clearly structured and almost entirely preassembled. Thanks to the plug-and-play feature, the data bus wiring and network hardware can be installed in no time at all. The standard wiring connecting the data bus to the fan unit via two RJ45 connectors allows for quick assembly and makes alterations and extensions exceptionally simple. Thanks to the automatic DCI function of the control devices, the entire system can be activated in very little time.

Labeling Fan Units and Field Devices

The length of the data bus wiring is specified through the use of different colors, with a range of various preassembled wire lengths available. The fan units and field devices can be labeled during the activation process. The control system applies a defined address (subnet/node) to every system component.

Quality Checks

Assembly must undergo extremely stringent quality checks, ensuring superior levels of reliability in system operations.

Potential Components for Installation

UPS

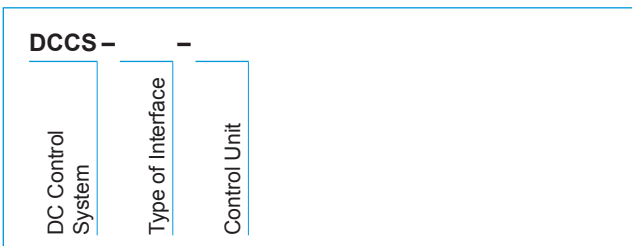
→ Uninterruptible power source with a battery run time of at least five minutes

Additional Control System

Modbus RTU

If the devices will not be used with a Exyte control system, but directly with an existing external control, FFU's with Modbus RTU interface could be used.

Model Designation



Type of Interface
 LR LON RS485
 LF LON FTT10A
 Exyte Bus
 Modbus RTU

Control Unit
 H1 Control Terminal
 H2 CRiS^{xt} (incl. hardware)
 H3 Ultra Display

Important Information
 A ceiling layout in the standard CAD format (e.g. DWG, DXF) must be included with the tender to ensure precise installation of the cables.

Tender Text

___ (quantity) control systems for ___ (quantity) fan units with DC motors and a LonWorks RS485 or LonWorks FTT-10A bus interface.

The control electronics are integrated into the fan unit casing, making it unnecessary to install the electronics in the building itself.

The network is clearly structured and an almost entirely pre-assembled. Thanks to the plug-and-play feature, the data bus wiring and network hardware, such as the repeater, iTAC, I/O modules and termination, can be installed and the entire system activated in no time at all. The standard wiring connecting the looped data bus to the fan unit via two RJ45 connectors allows for quick assembly and makes alterations and extensions exceptionally simple.

Assembly must undergo extremely stringent quality checks, ensuring superior levels of reliability in system operations.

Type of Interface

All control systems come ready to plug in using the plug-and-play feature. The following transfer mediums are available:

- LonWorks RS485 with an RS485 interface (RJ45 connector)
- LonWorks FTT-10A with an FTT-10A interface (RJ45 connector)
- Exyte Bus
- Modbus RTU

Control Unit

- Control Terminal**
 Mobile handheld device for managing and monitoring up to 199 fan units
 – For forwarding error reports to primary systems via the base station with integrated relay output [24 V (DC)/1 A] and power plug for charging the rechargeable batteries of the Control Terminal.
- CRiS^{tx}**
 Control software (including computer workstation) for managing, monitoring, displaying and parameterizing up to 70,000 individual fan units on their own or in groups.
 – Easy-to-use user interface with graphics
 – True-to-scale illustration of cleanroom ceiling and fan units, including room borders across several building levels
- Ultra Display**
 For managing networks of up to 63 fan units
 – Integration into the control cabinet door or mounting on the wall
 – Power supplied by a 24 V (DC) power plug
 – Forwarding of error reports via a potential-free relay contact

Signal Amplification (Repeater/iTAC)

Repeaters or iTACs amplify the signal within the network by dividing a segment into smaller segments using long bus lines or many bus users. Repeaters and iTACs are equipped with the following:

- RJ45 connectors to allow for plug-in feed-through of the data bus line
- A three-pin connector for supplying energy [208–277 V (AC), 50/50 Hz]
- A two-colored LED (red/green) to indicate function and signal the data bus activity

Important Information

Small systems featuring up to 63 fans and a data bus length shorter than 400 m do not require amplification.

iTACs (with CRiS^{xt})

Intelligent topology area controllers are used to manage systems featuring several thousand fan units or as a router to limit data bus activity to individual areas.

- _____ (quantity) iTAC LonWorks RS485 Router with 10x amplification for up to 630 fan units
- _____ (quantity) iTAC LonWorks FTT-10A Router with 10x amplification for up to 630 fan units

RJ45 Data Bus Wiring

As a preassembled, halogen-free CAT5 patch cable with RJ45 connector, 8-pin

- _____ (quantity) CAT5 patch cables, 3 m long, yellow jacket
- _____ (quantity) CAT5 patch cables, 5 m long, blue jacket
- _____ (quantity) CAT5 patch cables, 7.5 m long, green jacket
- _____ (quantity) CAT5 patch cables, on a reel, gray jacket
- _____ (quantity) RJ45-to-RJ45 couplings (1:1)
For connecting individual patch cables

Termination

A termination is required at the beginning and end of each bus line. With the addition of repeaters or iTACs, another termination is required for each channel. All terminations come ready to plug in.

Electric Wiring

Preassembled halogen-free stubs (3 x 1.5 mm², flexible) with a three-pin connector are used to connect the fan units to the ribbon cable segment, which is plugged into the connector at the top of the fan unit. Symmetric phase distribution is achieved using fan unit supply lines with colored markings and coded plugs.

System Components

- _____ m ribbon cable
- _____ (quantity) ribbon cable system end pieces
- _____ (quantity) ribbon cable system feed sockets

Connecting Wires, 3 m

- _____ (quantity) phase L1
- _____ (quantity) phase L2
- _____ (quantity) phase L3

Connecting Wires, 6 m

- _____ (quantity) phase L1
- _____ (quantity) phase L2
- _____ (quantity) phase L3

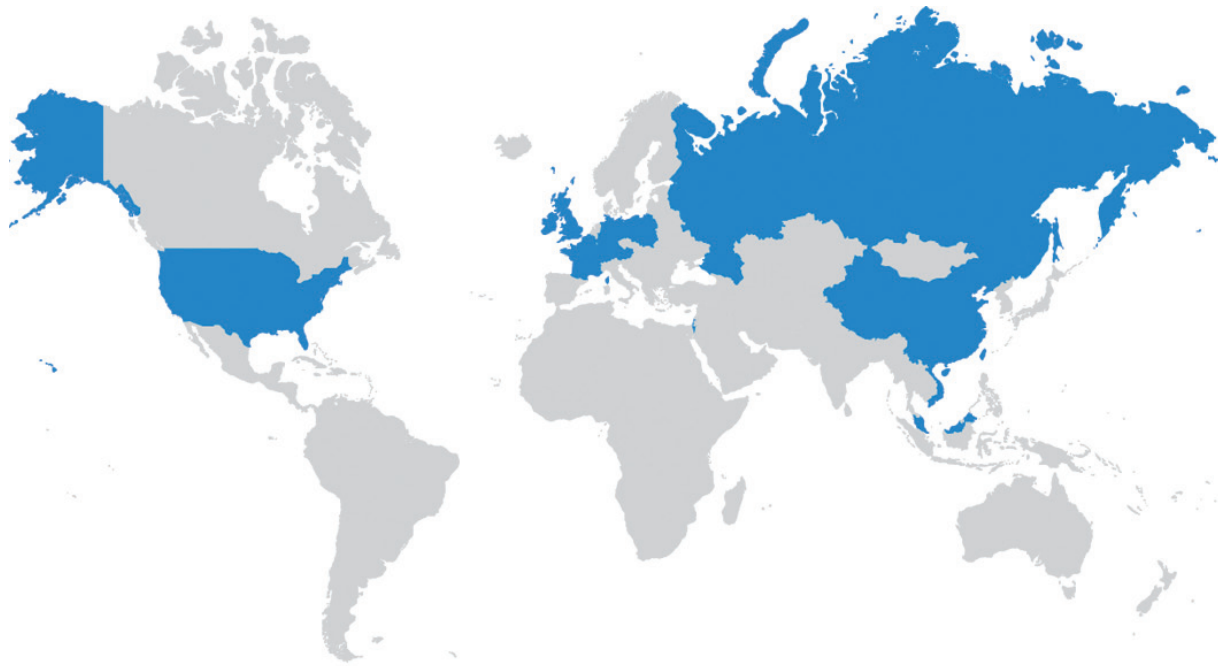
Service/Engineering

- Network Planning / Installation Planning**
In compliance with the current “LON-Guidelines” with drawings in CAD-format (data-bus route of the specified fan-unit layout as well as repeater, termination, I/O-Module etc.).
- Documentation**
The documentation includes a system description, user handbooks for the control components used, installation plans with data bus path (topology) and configuration of all fan units, repeaters, terminations and I/O modules, description of all software and hardware components, lists of programs and replacement parts with ordering information, data protection for the entire CRiS^{xt} system and licensed versions of the operating system.
- CRiS^{xt}, iTAC, Control Terminal and Ultra Display Training Courses**
To be offered by arrangement
 - At your company
 - At the Exyte Technology training center in Stuttgart

Brand Exyte Technology GmbH

Model CSD-____-____

Local Support Wherever You Need Us



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