JetControl 420EXT

Controllers

– Supports up to 8 servo axes
– Up to 256 local I/Os (expandable non-centrally to > 65,000)
– 32 MB STX program/data storage
– 240,000 bytes of non-volatile memory
– 1 × Ethernet connection with integrated switch
– EtherCAT® (option)
– 2 × CANopen®
– 1 × serial interface
– 1 × USB 2.0 (for storage media)
– Web server
– E-mail client (option)
– Modbus TCP (option)
– OPC UA server (option)
– MQTT (option)
– Programming in STX (high-level language in accordance with IEC-61131-3)
– Multitasking
– File handling
– String processing

Description

The JetControl 420EXT controller offers an ideal price-to-performance ratio in a compact design for medium to complex control tasks that demand both motion control functionality (up to 8 axes) and connectivity.

In combination with the servo amplifiers of the JetMove 1000/2000/3000 series and the servo motors with integrated amplifier of the JMX series, this controller provides an easy way to get started in the world of motion control.

With the JC-420EXT, point-to-point axes (PtP) and technology axis groups such as cam disks as well as path groups with circular and linear interpolation can be programmed and placed in operation in a very simple manner.

Technical Data

Non-volatile memory (NVRAM)	240,000 bytes (60,000 registers)
STX program/data storage (SDRAM)	32 MB
Flash disk	32 MB
Number of expansion modules	16 JX3-IO modules local (expandable locally)
Number of axes (MCX) (motion control/path control)	Max. 8
Ports and interfaces	1 serial interface (RS232/422/485)
	1 EtherCAT® (option)
	2 CANopen®
	2 Ethernet ports (with integrated switch)
Expandable by	JX3-IO modules, JM-1000/2000/3000, JCF4 options
Real-time clock	Yes
Modbus TCP	Option
Rated input voltage	DC 24 V (-15 % ... +20 %)
Input current	2.3 A @ DC 24 V
Dimensions (H × D × W)	approx. 131 × 100 × 75 mm
Degree of protection	IP20
Operating temperature	0 ... +50 °C
Storage temperature	-40 °C ... +70 °C
Relative humidity	5 % ... 95 %, non-condensing

Ordering information

Article no.	Designation	Description
10002630	JC-420EXT	Basic device JC-420EXT including the following options:
10001752	JCF4-C_ETH_(PRIM)	User-programmable Ethernet
10001744	JCF4-C_ETHERCAT_MASTER	EtherCAT Master (BN-EC, JM)
10001751	JCF4-C_FTP_CLIENT	FTP client file dispatch from STX
10001748	JCF4-C_MODBUS/TCP	MODBUS/TCP client + server
10001753	JCF4-C_MQTT	MQTT client
10001747	JCF4-C_OPCUA_SERVER	OPCUA server
10001746	JCF4-C_OPCUA_CLIENT	OPCUA client
10001750	JCF4-C_SMTP	SMTP client (e-mail dispatch)
10001741	JCF4-M_AX	1 physical axis (including PtP function)
10001743	JCF4-M_PATH	MCX path groups
10001757	JCF4-M_SV1	Software position function 16 axes via JX3-IO modules
10001742	JCF4-M_TECHNO	MCX technology groups

The following preferred types can be ordered pre-configured

Article no.	Designation	Description
10002644	JC-420EXT-ECM-MOD-FTC-ETP-SV1	JC-420EXT controller including the following options: 1 × EtherCAT master JCF4-C_ETHERCAT_MASTER 1 × MODBUS/TCP server + client JCF4-C_MODBUS/TCP 1 × FTP client in STX JCF4-C_FTP_CLIENT 1 × Ethernet in STX programming JCF4-C_ETH_(PRIM) 1 × simple servo function for JX3-IO modules JCF4-M_SV1
10002645	JC-420EXT-AXS_006-ECM-MOD-FTC-ETP-SV1	JC-420EXT controller including the following options: 6 × phys. axis incl. PtP function JCF4-M_AX 1 × EtherCAT master JCF4-C_ETHERCAT_MASTER 1 × MODBUS/TCP server + client JCF4-C_MODBUS/TCP 1 × FTP client in STX JCF4-C_FTP_CLIENT 1 × Ethernet in STX programming JCF4-C_ETH_(PRIM) 1 × simple servo function for JX3-IO modules JCF4-M_SV1
10002646	JC-420EXT-AXS_006-TEC-ECM-MOD-FTC-ETP-SV1	JC-420EXT controller including the following options: 6 × phys. axis incl. PtP function JCF4-M_AX 1 × MCX technology groups JCF4-M_TECHNO 1 × EtherCAT master JCF4-C_ETHERCAT_MASTER 1 × MODBUS/TCP server + client JCF4-C_MODBUS/TCP 1 × FTP client in STX JCF4-C_FTP_CLIENT 1 × Ethernet in STX programming JCF4-C_ETH_(PRIM) 1 × simple servo function for JX3-IO modules JCF4-M_SV1

Note

All options can also be ordered subsequently. To do this, specify the serial number of the JC-420EXT in your order. The options are activated by loading a license file.

Sample configuration

You have an application with 4 axes (JM-1000 or 3000 servo amplifier) and you need motion control for technology functions (such as a cam disk). You also want to make operating data available to other devices via OPC UA.
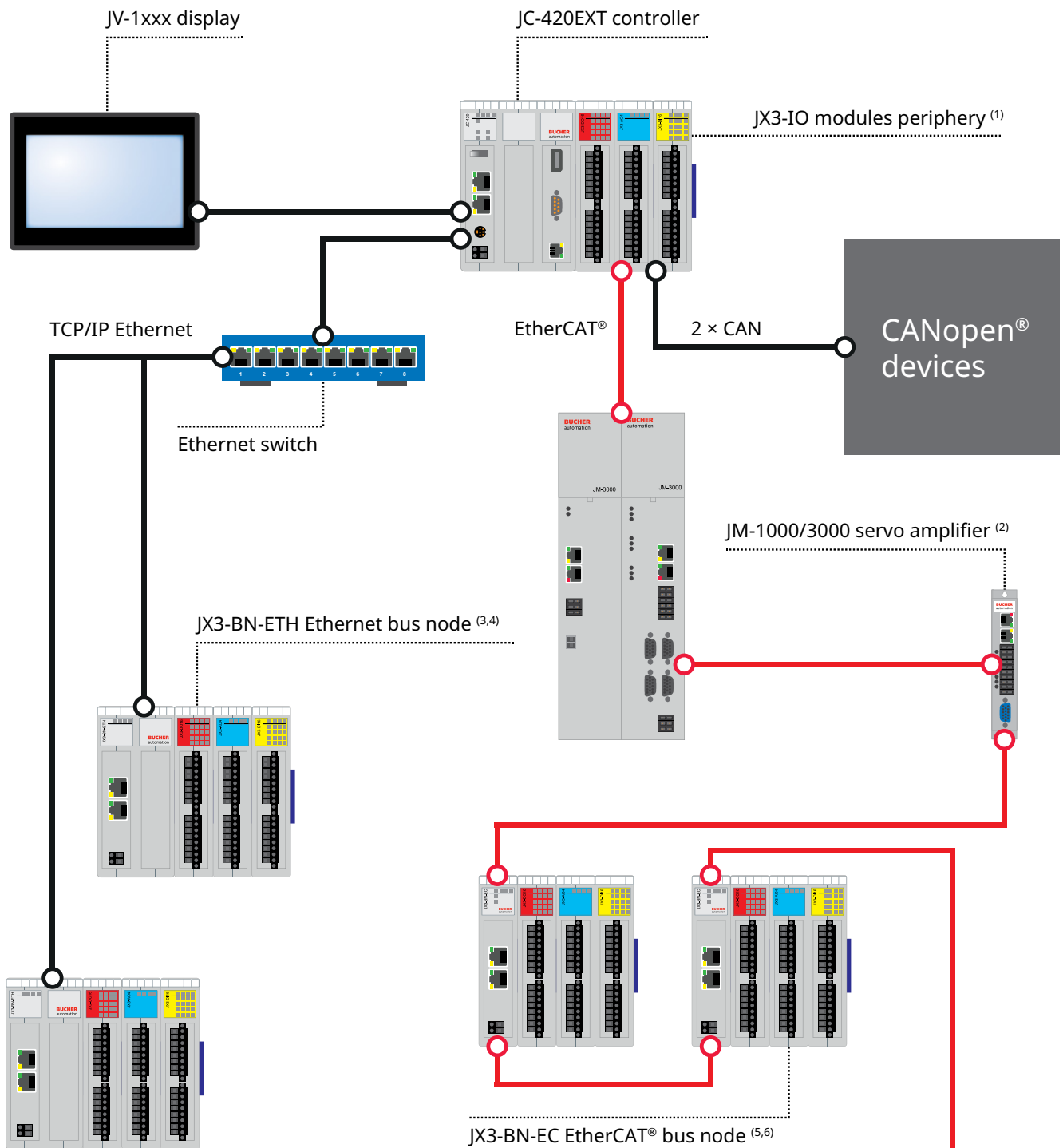
For this you will need:
1 × 10002646 – JC-420EXT-AXS_006-TEC-ECM-MOD-FTC-ETP-SV1
1 × 10001747 – JCF4-C_OPCUA_SERVER

Note

The preferred type with 2 axes more than required is cheaper than an individually configured controller with 4 axes.

Configuration aid

The JCF license configurator supports you in configuring the options for the JC-420EXT.

JV-1xxx display

JC-420EXT controller

JX3-IO modules periphery [1]

TCP/IP Ethernet

EtherCAT®

2 × CAN

CANopen® devices

Ethernet switch

JX3-BN-ETH Ethernet bus node [3,4]

JM-1000/3000 servo amplifier [2]

JX3-BN-EC EtherCAT® bus node [5,6]

EtherCAT® devices of third-party providers

[1] Up to 16 × JX3-IO modules locally on a JetControl 300/400
[2] Up to 8 × JM-1000/3000 servo amplifiers
[3] Up to 199 × JX3-BN-ETH
[4] Up to 16 × JX3-IO modules per JX3-BN-ETH bus node
[5] Up to 99 × JX3-BN-EC
[6] Up to 32 × JX3-IO modules can be connected (depending on the type of module)
The maximum number of devices on the EtherCAT® system bus is limited to 127.

Dimensional drawing
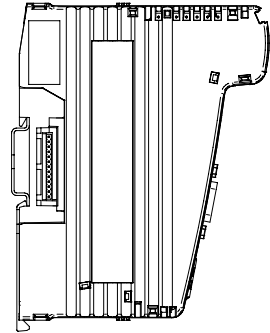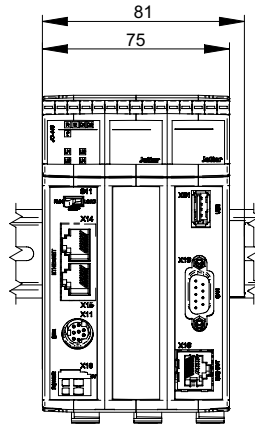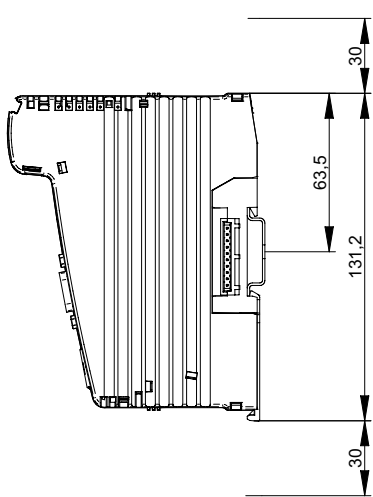
High-precision movements and control with MCX

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Precise movements and control

The range of possible applications for MCX motion control is almost unlimited. MCX technology shows its full potential whenever complex motion sequences meet challenging production specifications. Integrated into Bucher Automation controllers, MCX helps achieve maximum processes efficiency and profitability.

All-purpose application

– Screw capping machines
– Winding machines
– Wood, plastic, glass, and stone machining
– Textile machinery
– Packaging systems
– Handling and assembly systems
– Robot kinematics
– Palletizing systems
– Special-purpose machines

The systems deliver advanced positioning accuracy combined with increased dynamics thanks to the professional engineering of motion sequences with limited jerk. Consistent quality in the continuous processing workflow is achieved by using the electronic cam disk and gear functions.

Our motion control technology

– Electronic gearing
– Electronic cam disc
– Interpolation using user-defined mathematical functions
– Dynamic coupling/decoupling with reference to a leading axis
– Print mark for high-precision position correction
– Cross cutter
– Flying saw

Tool Center Point – to the point

For a tool center point movement, we define path groups. They support linear and circular interpolation (2D and 3D). Spline interpolation between defined path points guarantees optimum path generation. The configurable jerk limitation reduces machine vibrations.

Being able to combine these features greatly increases system versatility and simplifies customization to specific application needs.

The MCX hardware and software package

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Select your JetControl controller with MCX functionality from a scalable platform. Suitable servo amplifiers of the JetMove series delivering 250 W to 15 kW of continuous power, and servo motors with gearbox round off the system.

Controllers with MCX feature

JetControl 365MC
– Up to 12 axes
– 4 path groups
– 6 technology groups
– 24 cam discs/100 segments

JetControl 420EXT
– Up to 8 axes
– 4 path groups
– 6 technology groups
– 24 cam discs/100 segments

JetControl 440EXT
– Up to 24 axes
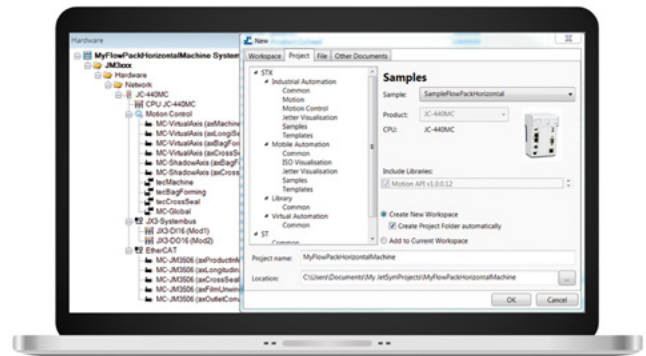– 4 path groups
– 6 technology groups
– 24 cam discs/100 segments

JetControl 96xEXT
– Up to 128 axes
– 50 path groups
– 100 technology groups
– 24 cam discs/100 segments

JetControl 97xMC
– Up to 64 axes
– 50 path groups
– 100 technology groups
– 24 cam discs/100 segments
– Integrated IPC with Windows OS

JetSym – one programming tool for all control systems

Power to the software – STX for smart coding

The motion controllers are programmed using STX, a programming language offering powerful axis and path control commands and compliance with IEC 61131-3 ST. Programming is essentially process-oriented following sequential tasks. Up to one hundred tasks are available to structure the program.

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Further information and detailed ordering instructions are available on request.
Subject to technical change without notice, errors excepted.