BUCHER automation

Product overview







60888678_00

Servo amplifier

JM-100x, JM-2xxx, JM-3xxx

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Translation of the german original User Manual

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1 Introduction

1.1 Information on this document

This document is a condensed summary of key information on the model code number, connectivity and diagnosis of the JM-100x, JM-2xxx and JM-3xxx servo amplifiers supplied by Bucher Automation AG.

All data is sourced from the respective products' user manuals.

NOTICE



Applicable documents

For the servo amplifier user manuals go to www.bucherautomation.com and open *Products* > *JetMove family* > ... > *Downloads*.

1.2 Products

This documents provides a summary of the following devices:

JetMove 100x

JM-1005/ JM-1008

JetMove 2xxx

JM-2203, JM-2403, JM-2206, JM-2406, JM-2410, JM-2414, JM-2423

JM-D2203, JM-D2206, JM-D2403, JM-D2406, JM-D2410

JetMove 3xxx

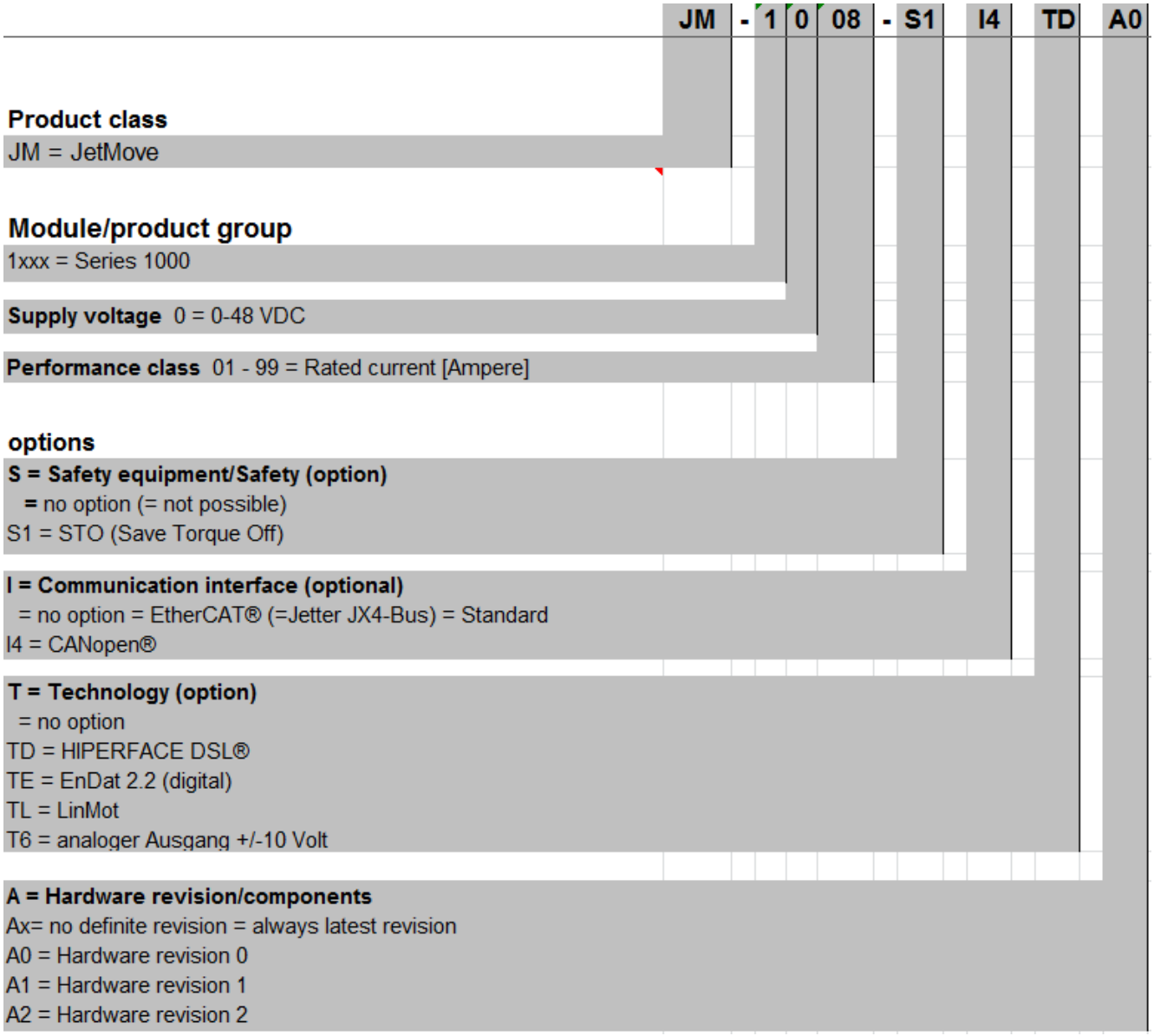
JM-3506, JM-3512, JM-3518, JM-3524, JM-3532

JM-D3503, JM-D3506, JM-D3512, JM-D3516

JM-T3503, JM-T3506, JM-T3512

2 JM-1000 Servo amplifiers

2.1 Order code



2.2 Electrical data

Parameter	Description
Control voltage	DC 24 V (-15 % … +20 %)
Motor power supply	DC 24 … 48 V
Ambient temperature in operation	0 °C ... +40 °C
Relative humidity	5 % … 85 %, non-condensing

Tab. 1: Key electrical data

2.3 Item numbers

Part	Designation	Item number
JM-1008	JM-1008-S1A0	60881662
Motor (S-X, rotating connector)	JHN2-0028-005-6RVS-X	60887991
Motor cable (1 m)	KAY_1110_0100	60879685
Resolver cable (1 m)	KAY_1023_0100	60882182

Tab. 2: Item number examples

2.4 Summary of ports and interfaces

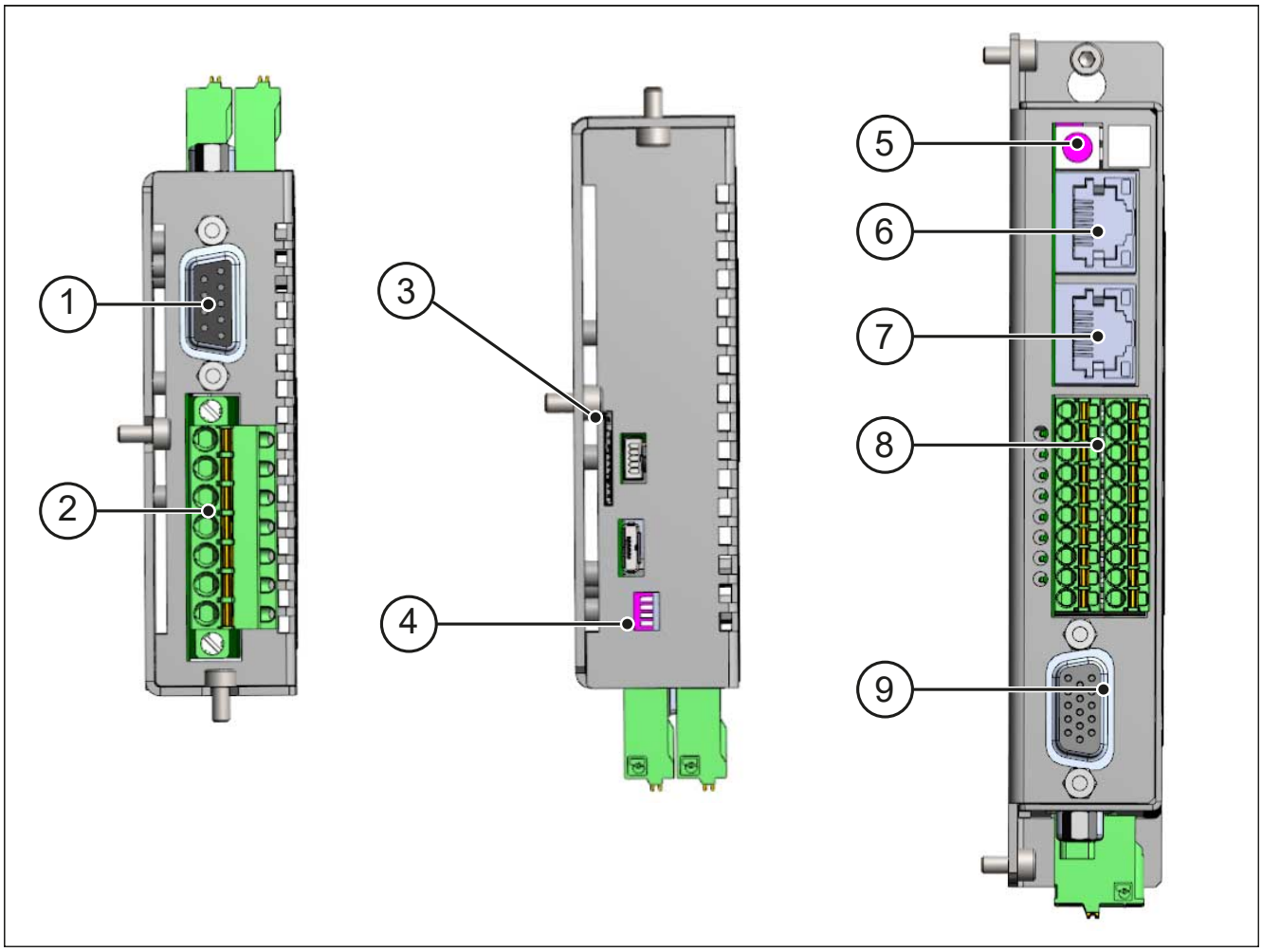


Fig. 1: Connections

1	Encoder interface X61	2	Power and motor interface X1
3	X22 SD memory card port	4	DIP switch S2
5	Address selector S1, optional	6	Fieldbus interface IN X18
7	Fieldbus interface OUT X19	8	I/O interface X10
9	Encoder interface X62		

2.4.1 Service interfaces

The service interfaces are unavailable to the user application. They are reserved to be used by Bucher Automation AG only.

The service interfaces are listed below:

– RS-232 interface (X20)
– USB port (X21)
– SD card slot (X22)

2.5 Block diagram

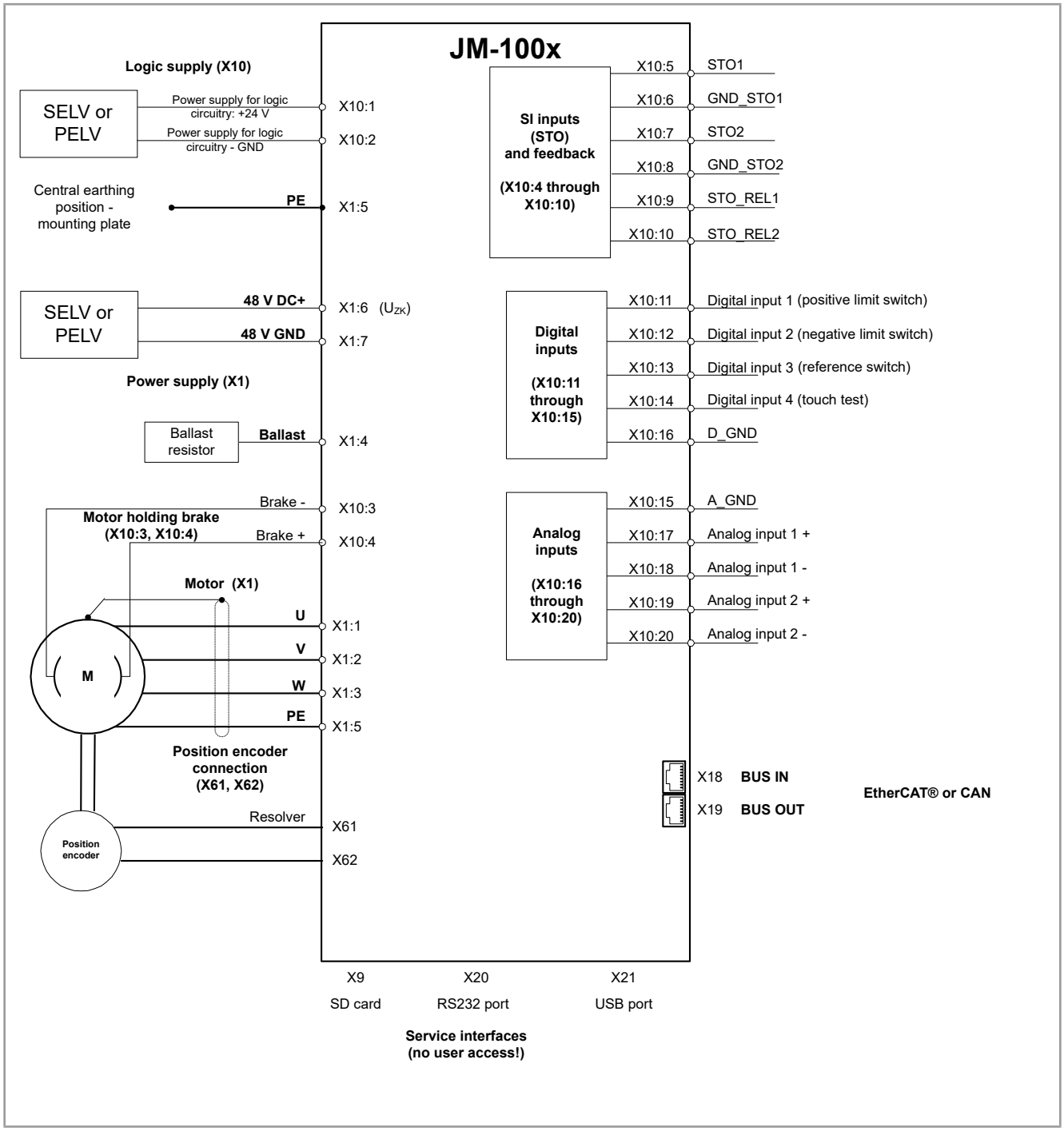


Fig. 2: Block diagram_JM-100X

2.6 Connections

2.6.1 Power and motor interface X1

PIN	Signal	Motor type		
		Servo motor	DC motor with brushes	LinMot
		BLDC		Low-rating linear motors
		3-phase stepper motor		2-phase stepper motor
X1:1	U	U	U+	U+
X1:2	V	V	U-	U-
X1:3	W	W	n. c.	V+
X1:4	Ballast	Ballast	Ballast	V-
X1:5	PE	Protective conductor terminal		
X1:6	DC 48 V	Power supply independently of the motor type		
X1:7	48 V (GND)			

2.6.2 DIP switch

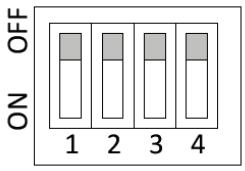


Fig. 3: DIP switch

With EtherCAT operation, the DIP switches are without function.

2.6.3 Encoder X61/X62

Position encoders can be connected to X61 and X62. A second encoder which is directly fitted to the mechanical system can be used to detect its position.

The following combinations are supported:

Motor encoder	Second encoder
Resolver	No encoder
	Sine/cosine incremental encoder
	Incremental encoder RS-422
	EnDat 2.2 (digital)
HIPERFACE DSL®	No encoder
	Sine/cosine incremental encoder
	Incremental encoder RS-422
EnDat 2.2 (digital)	No encoder
	Sine/cosine incremental encoder
	Incremental encoder RS-422

Motor encoder	Second encoder
Sine/cosine incremental encoder	No encoder
Incremental encoder RS-422	No encoder
LinMot	No encoder

2.6.4 EtherCAT X18 / X19 RJ45 socket

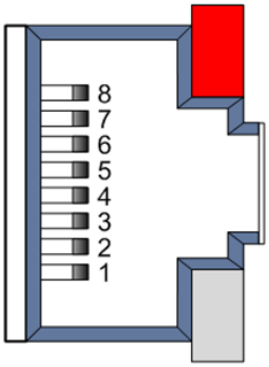


Fig. 4: X18 bus IN

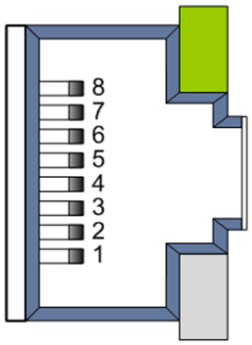


Fig. 5: X19 bus OUT

LED	Status	Description
ECAT-RUN (green)	OFF	The bus coupler is in Initialization state.
	flashing	The bus coupler is in Pre-operational state.
	Single flash	The bus coupler is in Safe-operational state.
	ON	The bus coupler is in Operational state.
ECAT-ERR (red)	OFF	No error
	flashing	General configuration error
	Single flash	Illegal status change
	ON	Watchdog timeout

Tab. 3: EtherCAT status LED

2.7 LED indicators

To enable visual diagnostics, the servo amplifier features 8 status LEDs located vertically next to the X10 I/O interface.

With the LEDs being controlled by the microcontroller, the signalled operating states depend on the firmware being used.

NOTICE! For reasons of user friendliness, the following illustration shows the LEDs arranged horizontally (rotated through 90° to the right). On the device, the red error LED is the bottommost light.

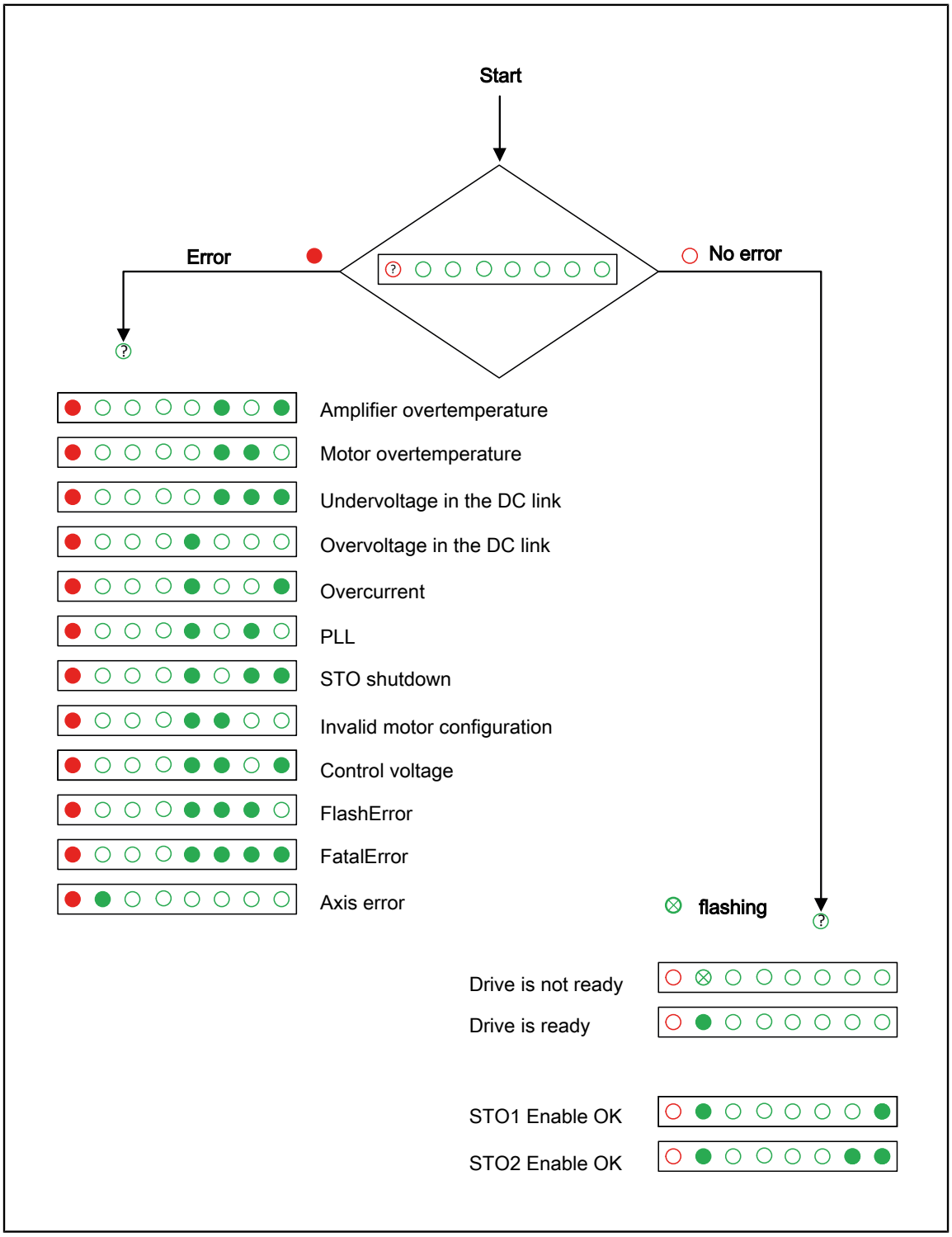
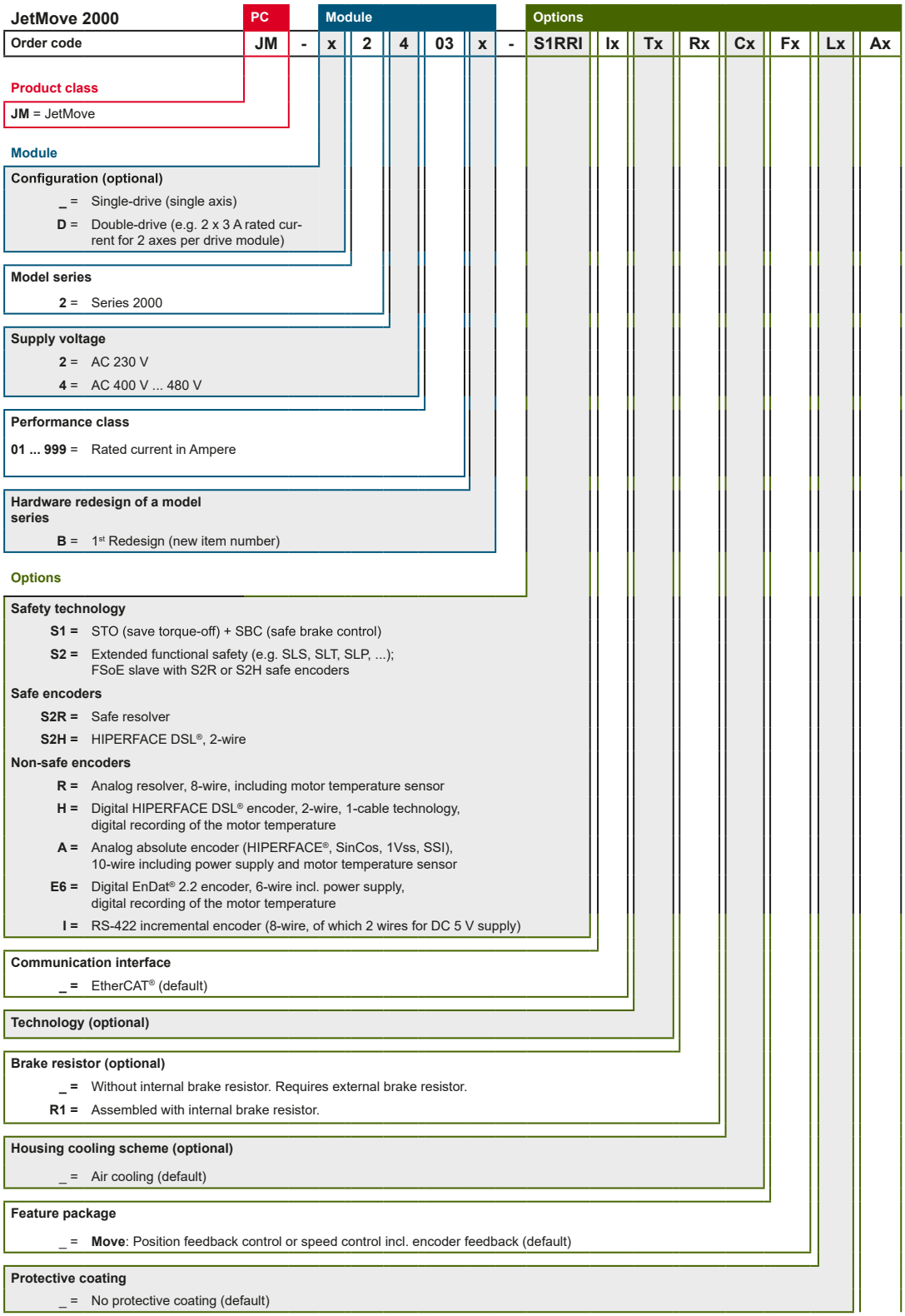
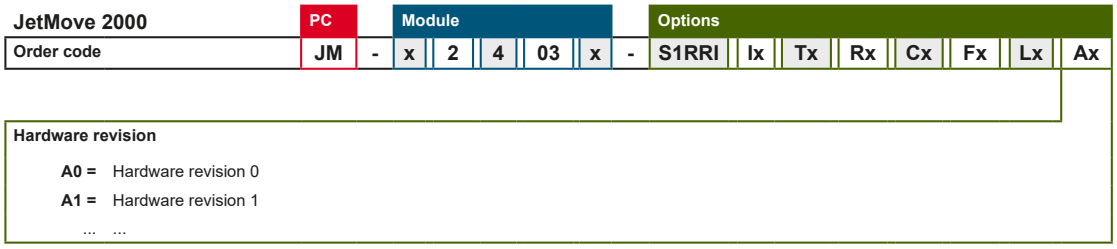


Fig. 6: Servo amplifier operating states

3 Servo amplifier JM-2000

3.1 Order code





3.2 Environmental conditions

Parameter	Description
Cooling air temperature	0°C ... +55 °C, power decrease must be taken into account at 45 °C or higher: -2.5 %/K
Storage temperature	-25 °C … +55 °C / -13 °F … +131 °F
Transport temperature	-25 °C … +70 °C / -13 °F … +158 °F
Relative humidity	5 % ... 85 %, non-condensing
Installation altitude above sea level	0 m … 4000 m (power decrease above 1000 m)
Overvoltage category on mains side	3 (III) to DIN EN 61800-5-1
Environmental specification	2 (II) to DIN EN 61800-5-1
Installation location	Pollution degree 2 without conductive condensation

Tab. 4: Technical data – environmental conditions

3.3 Encoder options

Encoder option	Description	Motor encoder	Additional encoder	Cable technology
JM-2000-R	Resolver	X		2
JM-2000-H	HIPERFACE DSL®	X		1
JM-2000-A	HIPERFACE® analog / SinCos	X	X	2
JM-2000-E6	EnDat® 2.2	X	X	2
JM-2000-I	Incremental encoder	X	X	2
JM-2000-S2R	Safe resolver	X		2

Tab. 5: Encoder options

3.4 Encoder plug-in slots

The JM-2206 / JM-2406 / JM-2410 servo amplifiers feature 2 encoder plug-in slots.

The JM-D2203/ JM-D2206 / JM-D2403 / JM-D2406 servo amplifiers feature 3 encoder plug-in slots.

The order of the encoders on the is always from right to left.

For the encoder assembly, refer to the nameplate and the order code.



Fig. 7: Encoder plug-in slots

1	Connection X412 - motor encoder for axis 1
2	Connection X432 - additional encoder



Fig. 8: Encoder plug-in slots

1	Connection X412 - motor encoder for axis 1
2	Connection X422 - motor encoder for axis 2
3	Connection X432 - additional encoder

3.5 Status indication

The LEDs of the status display indicate the states of the safety functions and the amplifier.

The display differs depending on the safety system being installed (S1 or S2).

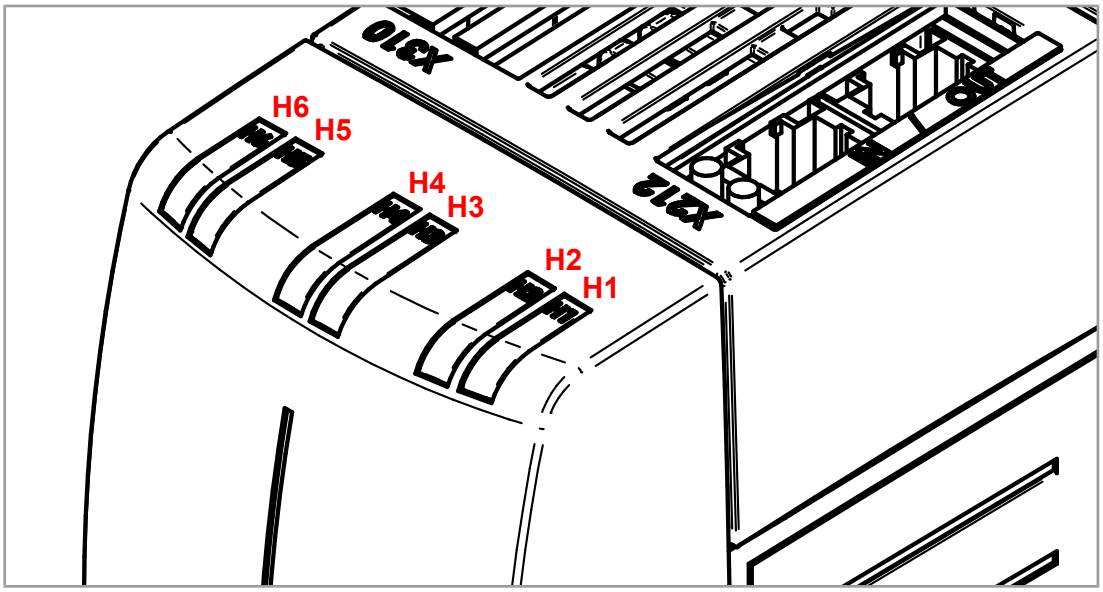
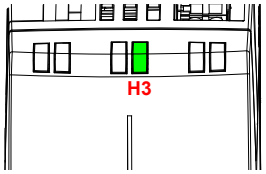


Fig. 9: Status indication

LED	Safety function S1	Safety function S2
H1	Amplifier status – axis 1	Amplifier status – axis 1
H2	-	-
H3	Safety status – axis 1	Safety status – axis 1
H4	-	Safety status – axis 1
H5 / H6	-	-

Safety function S1



LED	H3	Description
Color	Green	STO is not active.
Status	ON	
Color	Green	STO is active.
Status	Blinking at 1 Hz	
Color	Red	Bootloader, initialization, configuration, startup until ready to switch on or error
Status	ON	
Color	-	Reset or no voltage
Status	OFF	

Amplifier status LEDs



LED	H1		Description
Color	Red / green		Programming phase
Status	Blinking at 4 Hz		
Color	Orange		Initialization phase
Status	ON		
Color	Green	Orange	Voltage is applied (DC 24 V).
Status without warning	Flashing at 2 Hz / 0.5 s pause	-	
Status with warning	Flashing at 2 Hz / 0.5 s pause	Blinking at 1 Hz	
Color	Green	Red	Preparation for controlled operation (Bootstrap, ShortCircuitTest, OffsetAdjustIADCs, FlyingStart, Magnetization)
Status without warning	Blinking at 4 Hz	-	
Status with warning	Blinking at 4 Hz	Blinking at 1 Hz	
Color	Green	Green / orange	Controlled operation including stop and quick stop
Status without warning	ON	-	
Status with warning	-	Blinking at 1 Hz	
Color	Red / green		Error response is active.
Status	Blinking at 4 Hz		
Color	Red		Error that cannot be acknowledged
Status	ON		
Color	Red		Waiting for error acknowledgment.
Status	Blinking at 1 Hz		

► See also chapter *Diagnostic capabilities by means of status indication* in the respective user manual.

3.6 Pre-assembled cables

Encoder cables

Component	Cable assembly
KAY_1423_xxxx resolver cable	(4 x 2 x 0.25)
KAY_1423Y_xxxx Resolver cable for motor with Y-Tec connector (12-pin operation)	(4 x 2 x 0.25)
KAY_1424_xxxx SinCos cable	(5 x 2 x 0.25)
KAY_1425_xxxx Incremental encoder cable with 17-pin operation Intercontec for JHQ motor (F41)	(5 x 2 x 0.25)
KAY_1425A_xxxx Incremental encoder cable with 12-pin operation Intercontec	(5 x 2 x 0.25)
KAY_1431_xxxx EnDat 2.2 cable, 6 wires	(4 x 2 x 0.25)
KAY_1433_xxxx HIPERFACE® cable	(5 x 2 x 0.25)
KAY_1433Y_xxxx HIPERFACE®-cable for motor with Y-Tec connector (12-pin operation)	(5 x 2 x 0.25)

Power cables

Component	Cable assembly
KAY_1410_xxxx 1.5 mm² power cable without brake (2-cable system)	(4 x 1.5)
KAY_1410Y_xxxx 1.5 mm² power cable without brake (2-cable system), for motor with Y-Tec connector	(4 x 1.5)
KAY_1412_xxxx 1.5 mm² power cable with brake (2-cable system)	(4 x 1.5 + (2 x 1.5))
KAY_1412Y_xxxx 1.0 mm² power cable with brake (2-cable system), for motor with Y-Tec connector	(4 x 1.0 + (2 x 0.5))
KAY_1414_xxxx power cable (2-cable system)	(4 x 2.5 + (2 x 1.5))

HIPERFACE® DSL cable (always with brake wires)

Component	Cable assembly
KAY_1411_xxxx 1.0 mm² HIPERFACE® DSL (1-cable system) for motor with M23 connector	(4 x 1.0 + (2 x 0.75) + (2 x AWG22))
KAY_1411I_xxxx 1.0 mm² HIPERFACE® DSL (1-cable system) for motor with I-Tec connector	(4 x 1.0 + (2 x 0.75) + (2 x AWG22))

Component	Cable assembly
KAY_1413_xxxx 1.5 mm² HIPERFACE® DSL (1-cable system) for motor with M23 connector	(4 x 1.5 + (2 x 0.75) + (2 x AWG22))
KAY_1415_xxxx 2.5 mm² HIPERFACE® DSL (1-cable system) for motor with M23 connector	(4 x 2.5 + (2 x 0.75) + (2 x AWG22))

3.7 Connections

3.7.1 Connection X12 – DC 24 V supply

X12 connects to:

– DC 24 V supply

Pin assignment

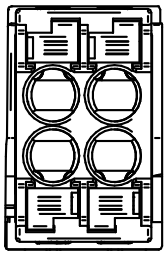


Fig. 10: Terminal X12,
4 pins

X12	
24Vin	**GND**
24Vin	**GND**

Tab. 6: Pin assignment – connection X12

– The 2 inputs for 24Vin are connected internally.
– The 2 GND inputs are connected internally.
– The second input can be used in each case to loop through additional drive controllers. The max. possible current load in 8 amps.
  The number of JetMove servo amplifiers for looping the DC 24 V voltage and GND through depends on the motor type (without or with brake) and the holding current of the motor brake. For larger motors with holding brake you can wire to max. one additional JetMove.

3.7.2 Connection X212 – EtherCAT®

X212 connects to:

– EtherCAT® master or EtherCAT® slave

LEDs

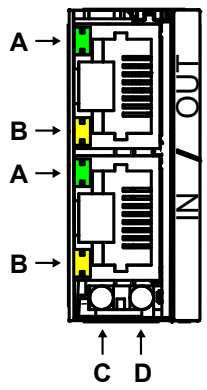


Fig. 11: Socket X212

RJ45 socket	Signal	LED	Color	Description
OUT	BUS OUT	**A**	Green	ACT: Data transmission
		B	Yellow	LINK: There is a connection to the network
IN	BUS IN	**A**	Green	ACT: Data transmission
		B	Yellow	LINK: There is a connection to the network

Tab. 7: LEDs – EtherCAT® RJ45 socket

LED	Designation	Color	Description
C	RUN	Green	EtherCAT®-communication active
D	ERR	Red	Error EtherCAT® communication

Tab. 8: LEDs – EtherCAT® status

Cables

You can order suitable cables separately as accessories.

3.7.3 Connection X21 – motor holding brake axis 1

X21 connects to:

– Motor holding brake for axis 1

Pin assignment

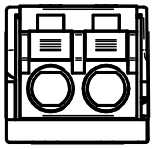


Fig. 12: Terminal X21, 2 pins

X21	
B+	**B-**

Tab. 9: Pin assignment – connection X21

3.7.4 Connection X22 – motor holding brake axis 2

X22 connects to:

– Motor holding brake for axis 2

Pin assignment

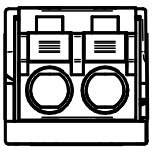


Fig. 13: Connection X22, 2 pins

X22	
B+	**B-**

Tab. 10: Pin assignment – connection X22

3.7.5 Connection X841, X842 – STO + SBC [S1]

STO = safe torque-off

SBC = safe brake control

Pin assignment X841

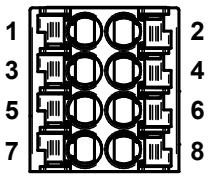


Fig. 14: Terminal X841, 8 pins

Pin	Signal	Description
1	**AX1_STOA_In**	STO input AX1 - requirement for pulse lock, channel A
2	**AX1_STOB_In**	STO input AX1 - requirement for pulse lock, channel B
3	**GND_AX1**	Reference potential AX1
4	**GND_AX1**	Reference potential AX1
5	**AX1_SBCA_In**	SBC input AX1 - requirement for safe brake, channel A
6	**AX1_SBCB_In**	SBC input AX2 - requirement for safe brake, channel B
7	n.c.	n.c.
8	n.c.	n.c.

Tab. 11: Pin assignment – connection X841

Pin assignment X842

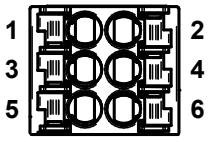


Fig. 15: Terminal X842, 6 pins

Pin	Signal	Description
1	**AX2_STOA_In**	STO input AX2 - requirement for pulse lock, channel A
2	**AX2_STOB_In**	STO input AX2 - requirement for pulse lock, channel B
3	**GND_AX2**	Reference potential AX2
4	**GND_AX2**	Reference potential AX2
5	**AX2_SBCA_In**	SBC input AX2 - requirement for safe brake activation, channel A
6	**AX2_SBCB_In**	SBC input AX2 - requirement for safe brake activation, channel B

Tab. 12: Pin assignment – connection X842

► For further information refer to the document *jm-2xxx-s1-sto_funktion_..._manual.pdf*.

3.7.6 Connection X843 – Extended safety function [S2]

The S2 feature is not available as of yet.

3.7.7 Port X210 – digital inputs (end switches)

– 4 digital inputs

Pin assignment

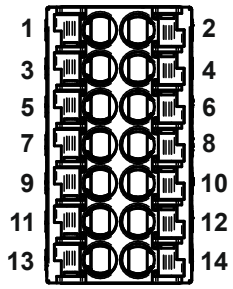


Fig. 16: Terminal X210, 14 pins

	Pin		Axis 1	Description
n.c.	1	**2**	**TP1**	TouchProbe
n.c.	3	**4**	**L+**	Limit switch + (limit +)
n.c.	5	**6**	**L-**	Limit switch – (limit -)
n.c.	7	**8**	**R**	Reference signal
n.c.	9	10	n.c.	
GND	**11**	12	n.c.	
n.c.	13	14	n.c.	

Tab. 13: Pin assignment – port X210 JM-2xxx

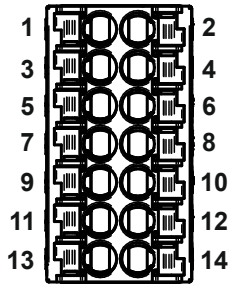


Fig. 17: Terminal X210, 14 pins

Description	Axis 2	Pin		Axis 1	Description
TouchProbe for axis 2: Position controller position for axis 2	**TP**	**1**	**2**	**TP**	TouchProbe for axis 1: Position controller position for axis 1
Limit switch + (limit +)	**L+**	**3**	**4**	**L+**	Limit switch + (limit +)
Limit switch - (limit -)	**L-**	**5**	**6**	**L-**	Limit switch - (limit -)
Reference signal	**R**	**7**	**8**	**R**	Reference signal
	n.c.	9	10	n.c.	
	GND	**11**	12	n.c.	
	n.c.	13	14	n.c.	

Tab. 14: Pin assignment – port X210 JM-D2xxx

4 JM-3000 Servo amplifiers

4.1 Order code

JetMove 3000	PK		Module						Options							
Order code	JM	-	x	3	5	16	x	-	S1	Ix	Tx	Rx	Cx	Fx	Lx	Ax

Product class

JM = JetMove

Module

Ausführung (optional)

_ = 1-axis module
D = 2-axis module (e.g. 2 x 3 A on one module)
T = 3-axis module (e.g. 3 x 12 A on one module)

Model series

3 = Series 3000

Supply voltage

5 = DC 560 V from supply unit

Performance class

01 ... 999 = Rated current in Ampere

Device revision (optional)

_ = First version
B = 1st Redesign

Options

Safety technology

_ = No safety equipment
S1 = STO (Save Torque Off) + SBC (Safe Brake Control)
S2 = Expanded functional safety (e.g. SLS, SLT, ...) for sensors, resolvers and HIPERFACE DSL®

Communication interface

_ = EtherCAT® (default)

Technology (optional)

_ = no option
TD = HIPERFACE DSL®

Brake resistor (optional)

_ = No internal braking resistor. An external braking resistor is required.

Housing cooling scheme (optional)

_ = Air cooling (default)
C1 = ColdPlate

Feature package

_ = default

Protective coating

_ = No protective lacquer (default)
L1 = Protective lacquer

Hardware revision

Ax = Current hardware revision
A0 = Hardware revision 0
A1 = Hardware revision 1
A2 = Hardware revision 2

4.2 Environmental conditions

Parameter		Description	Standards
Operating temperature		5 … 40 °C to 55 °C with power reduction (5 %/ °C)	DIN EN 61800-2, IEC 60721-3-3 class 3K3
Storage temperature		-25 … 55 °C	DIN EN 61800-2, IEC 60721-3-1 classes 1K3 and 1K4
Transport temperature		-25 °C ... 70 °C	DIN EN 61800-2, IEC 60721-3-2 class 2K3
Relative humidity for	Transport	95 % at max. 40 °C	
	The absolute humidity is limited to max 60 g/m³. This means that, at 70 °C for example, the relative humidity must not exceed 40%.		
	Storage	5 … 95 %	
	The absolute humidity is limited to max 29 g/m³. The maximum values for temperature and relative humidity listed in the table must not occur at the same time.		
	Operation	5 % … 85 % at 40 °C, non-condensing	
	The absolute humidity is limited to max 25 g/m³. This means that the maximum values listed in the table for temperature and relative humidity must not occur at the same time.		
Max. operating altitude		1000 m above sea level Over 1000 m above sea level with power reduction (1 % per 100 m, max. 2000 m above sea level)	DIN EN 61131-2
Installation location		Control cabinet **NOTICE! The ambient conditions for the device must also be observed in the control cabinet.**	
Corrosion immunity and chemical resistance		No special anti-corrosion precautions have been taken. The ambient air must not contain higher concentrations of acids, alkaline solutions, corrosive agents, salts, metal vapors and other corrosive or electroconductive contaminants.	
Degree of pollution – Electronics		Level 2	DIN EN 60664-1
		Only non-conductive dirt occurs. However, temporary conductivity due to condensation may occur.	

Tab. 15: Environmental conditions

4.3 Status indication

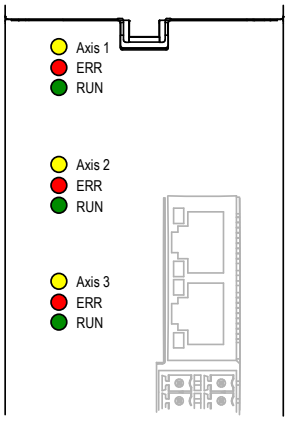


Fig. 18: Status indication of axes; e.g. 3-axis module

Depending on the version of the servo amplifier (1, 2 or 3-axis module), up to three times 3 LEDs are installed as status indicators. They are located on the front of the device and are assigned to axis 1 to axis 3 from top to bottom.

In the 1-axis modules, only the recesses for the LEDs are present for axes 2 and 3, and in the 2-axis modules for axis 3, and there is no labeling.

Color and status of the LEDs facilitate diagnosing various states.

The meaning of the LEDs is the same for all axes.

4.3.1 Function of the LEDs

LED	Color	Function
Axis 1 … 3	Amber	Reset ► For BLK or FLK please contact Bucher Automation AG
ERR	Red	Error indication
RUN	Green	Ready for operation / output stage active

Tab. 16: Function

4.3.2 Status indicator and lighting patterns of the LEDs

Axis	ERR	RUN	Axis state
ON	ON	ON	Reset/start or firmware update
OFF	OFF	1 x BLK	Not ready
OFF	OFF	2 x BLK, 2 x FLK	Switch on disabled
OFF	OFF	3 x BLK, 3 x FLK	Axis ready
OFF	OFF	4 x BLK, 4 x FLK	Axis switched on
OFF	OFF	ON, 5 x FLK	Operation enabled
OFF	OFF	6 x BLK, 6 x FLK	Quick stop
OFF	ON	7 x BLK, 7 x FLK	Response to error active
OFF	ON	8 x BLK, 8 x FLK	Error, the number of flashing signals on the red LED indicates the error number
OFF	FLK	OFF	Internal error in the firmware. The number of flashing signals provides an indication of the error location.

4.4 Connections

4.4.1 Connection X5.1 - EtherCAT®

Connect the following devices to port X5.1:

– JetControl controller with EtherCAT® master

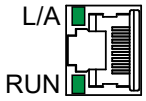


Fig. 19: X5.1, ECAT IN

Signal	LED	Specification	Color	Description
ECAT IN	L/A	Port0 Link/Activity		Shows the connection speed
			OFF	10 Mbit/s
			Green	100 MBit/s BASE-T
	RUN	Device/EtherCAT	Green	Connected to the network
			Green, flashing	Data transfer

4.4.2 Connection X5.2 - EtherCAT®

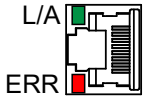


Fig. 20: X5.2, ECAT OUT

Signal	LED	Specification	Color	Description
ECAT OUT	L/A	Port1 Link/Activity		Shows the connection speed
			OFF	10 Mbit/s
			Green	100 MBit/s BASE-T
	ERR	Device/EtherCAT	Red	Error

4.4.3 Connection X6 - I/O signals

– The digital inputs are provided for connecting the limit and reference switches and the touch probe signals.

– DI09 and DI10 are suitable for touch probe tasks due to their fast signal processing.

– DI08 (standard DI) can be used for the touch probe function, too.

– A total of two touch probe inputs can be used for all three axes.

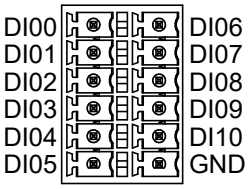


Fig. 21: Terminal X6, 12 pins

Assignment	Ref.	Type	Function
Axis 1	DI00	Standard DI	Limit switch+, A1
	DI01	Standard DI	Limit switch-, A1
	DI02	Standard DI	Ref. switch A1
	DI09	Fast DI	Touch probe
	DI10	Fast DI	Touch probe
	GND	DGND	Ground reference

Tab. 17: Assignment of the control inputs for 1-axis module

Assignment	Ref.	Type	Function
Axis 1	DI00	Standard DI	Limit switch+, A1
	DI01	Standard DI	Limit switch-, A1
	DI02	Standard DI	Ref. switch A1
	DI09	Fast DI	Touch probe
	DI10	Fast DI	Touch probe
Axis 2	DI03	Standard DI	Limit switch+, A2
	DI04	Standard DI	Limit switch-, A2
	DI05	Standard DI	Ref. switch A2
	DI08	Standard DI	Touch probe
	DI10	Fast DI	Touch probe
	GND	DGND	Ground reference

Tab. 18: Assignment of the control inputs for 2-axis module

Assignment	Ref.	Type	Function
Axis 1	DI00	Standard DI	Limit switch+, A1
	DI01	Standard DI	Limit switch-, A1
	DI02	Standard DI	Ref. switch A1
	DI09	Fast DI	Touch probe
	DI10	Fast DI	Touch probe
Axis 2	DI03	Standard DI	Limit switch+, A2
	DI04	Standard DI	Limit switch-, A2
	DI05	Standard DI	Ref. switch A2
	DI08	Standard DI	Touch probe
	DI10	Fast DI	Touch probe
Axis 3	DI06	Standard DI	Limit switch+, A3
	DI07	Standard DI	Limit switch-, A3
	DI08	Standard DI	Ref. switch A3
	DI08	Standard DI	Touch probe
	DI09	Fast DI	Touch probe
	GND	DGND	Ground reference

Tab. 19: Assignment of the control inputs for 3-axis module

4.4.4 Connection X11 - STO

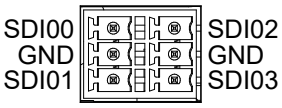


Fig. 22: Terminal X11, 6 pins

Ref.	Type	Function
SDI00	Safe digital input	STO 1 CH1
SDI01	Safe digital input	STO 1 CH2
SDI02	Safe digital input	STO 2 CH1
SDI03	Safe digital input	STO 2 CH2
GND	Ground reference	GND
GND	Ground reference	GND

Tab. 20: Specification of the control inputs X11/Safe DI

4.4.5 DIP switch block S-ADR (STO, SBC)

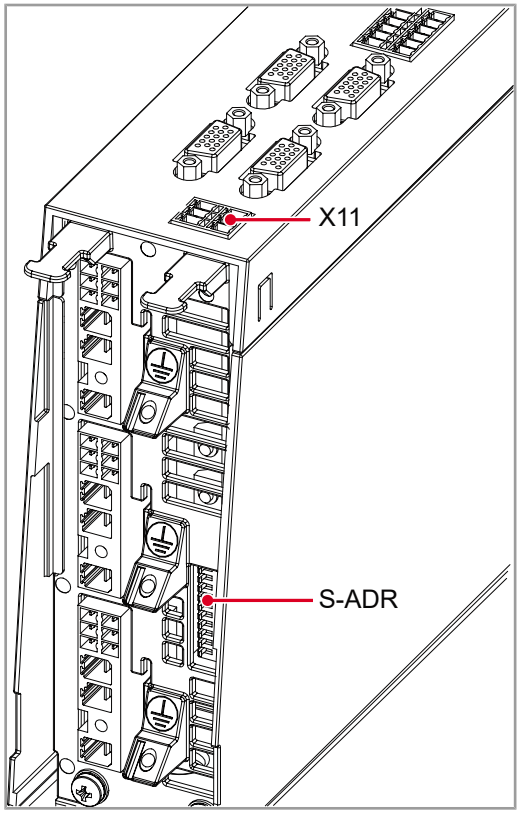
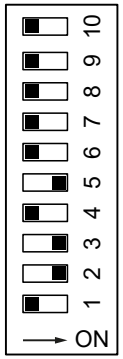
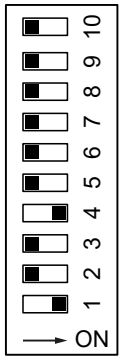


Fig. 23: Position of STO interface

NOTICE! The S-ADR DIP switch (switch block) is located on the rear of the device, while the X11 port (Safe-DI) is located on the face.

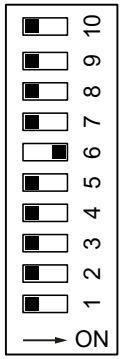
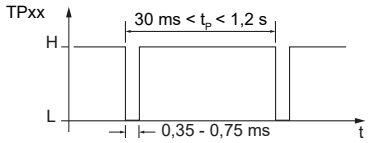
DIP switch settings for selecting STO inputs

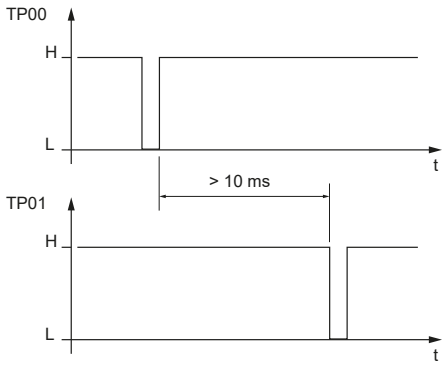
Switch	Switch position	Status	Function	Comment
1 … 5 STO1 on all axes DIP 1 OFF DIP 2 ON DIP 3 ON DIP 4 OFF DIP 5 ON		Combined circuit of all existing axes		– Since the JM-3000 can be designed as a single-axis, double-axis or triple-axis servo amplifier, it has two STO1/STO2 digital inputs, each of which is designed with two channels. – If double-axis or triple-axis servo amplifiers are used, two different presettings can be selected with the S-ADR DIL switch block: – STO1 (all 2 or 3 axes are switched off via STO1 in 2 channels) or – STO1 (for axis 1) and STO2 (for axes 2 and 3).
		Separate switching of the axes that are present		

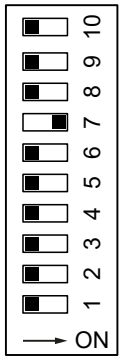
Tab. 21: DIP switch settings for selecting STO inputs

DIP switch settings for selecting test pulse monitoring

<table>
<tr><th>Switch</th><th>Switch position</th><th>Status</th><th>Format of the test pulses</th><th>Comment</th></tr>
<tr><td rowspan="2">6 … 7

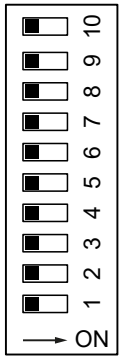
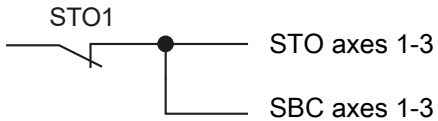
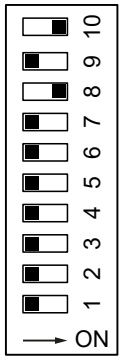
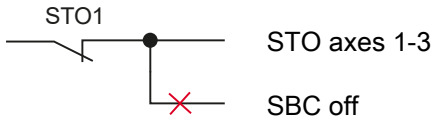
Test pulse monitoring for safety SPS only
— hence OFF
DIP 6 OFF
DIP 7 ON</td><td>
</td><td>Monitoring of test pulses at the input is switched on</td><td>

Specification of test pulses


Phase shift between TP00 and TP01</td><td rowspan="2">– To detect short circuits and cross faults in the wiring of the inputs, test pulses can in addition be modulated to the input signals.
– The test pulses can be monitored by the servo amplifier.
– Test pulses for the STO inputs can come from the supply unit or from safe outputs of a safety PLC. There must be a phase shift greater than 10ms between the test pulses on STO1 (TP00) and the test pulses on STO2 (TP01).</td></tr>
<tr><td>
</td><td>Monitoring of test pulses at the input is switched off</td><td></td></tr>
</table>

Tab. 22: DIP switch settings for selecting test pulse monitoring

DIP switch settings for selecting SBC

Switch	Switch position	Status	Function	Comment
8 … 10 SBC always OFF — brake check via safety SPS DIP 8 ON DIP 9 OFF DIP 10 ON		SBC active		– **The SBC safety function is permanently connected to input STO1 (X11/SDI00 and SDI01).** – The number of axes depends on the STO setting
		SBC off		

Tab. 23: DIP switch settings for selecting SBC

4.4.6 Encoder connection

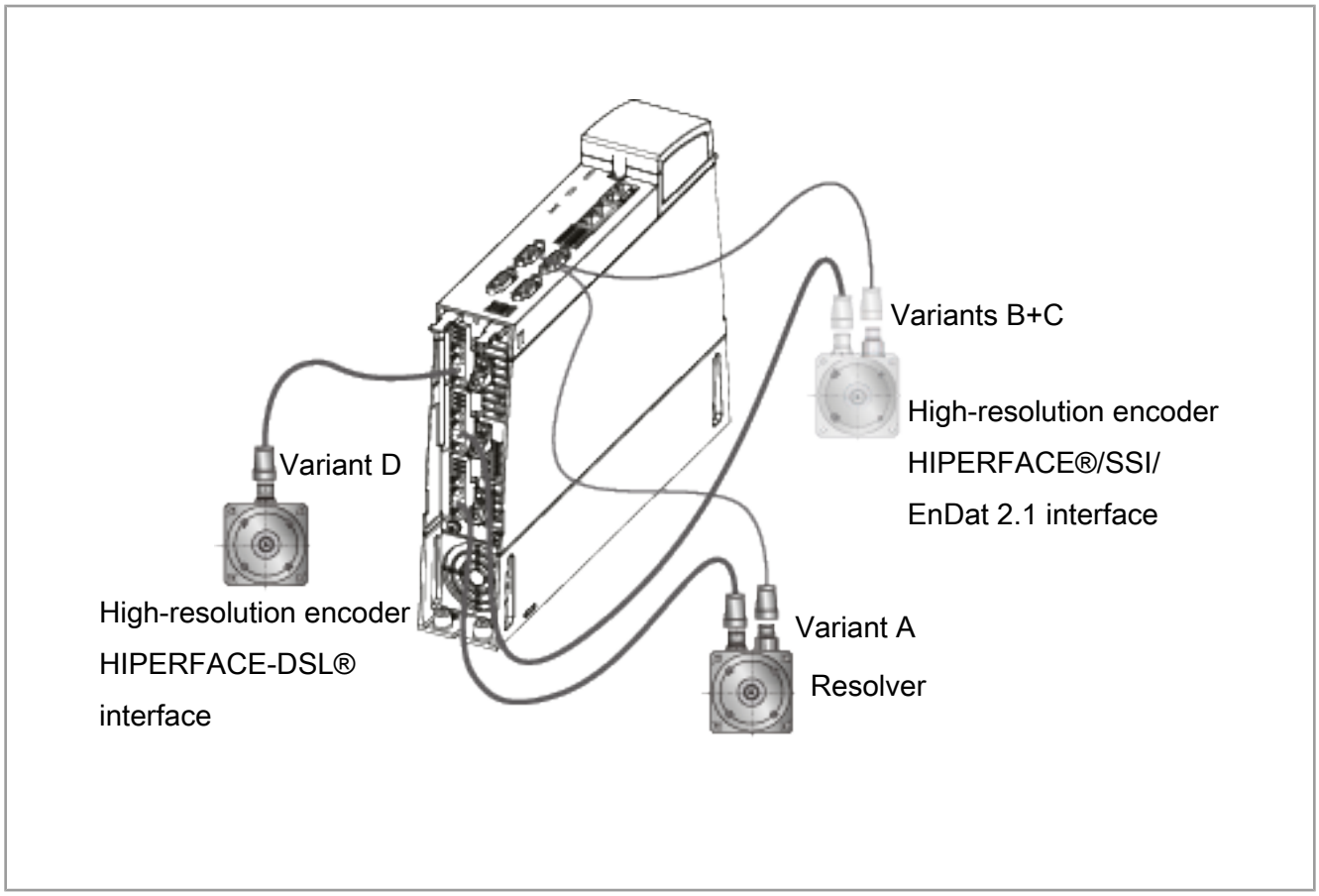


Fig. 24: Assignment of motor and encoder cable

Variant	Motor (with built-in encoder)	Encoder cable	Motor cable
		Bucher Automation servo motors	
A	with resolver	See "Accessories" in Industrial Automation catalog	
B	Absolute encoder with HIPERFACE® interface		
C	Absolute encoder with EnDat®/SSI interface		
D	Absolute encoder with HIPERFACE DSL® interface	HIPERFACE DSL® single-cable solution	

Tab. 24: Variants of motors, encoder type and encoder cable

4.4.7 Encoder plug-in slots X7, X8, X9 and X10

Parameter	JM-3xxx	JM-D3xxx	JM-T3xxx
Number of encoder ports	2	4	4
Encoder types	- Enc1 – multi-encoder interface - Enc2 – single-encoder interface		
Connection X7/ Axis1 Enc1	SinCos and TTL EnDat/SSi HIPERFACE® BISS Resolver		
Connection X8/ Axis1 Enc2	SinCos and TTL Resolver		
Connection X9/ Axis2 Enc1	-	SinCos and TTL EnDat/SSi HIPERFACE® BISS Resolver	
Connection X10/ Axis2 Enc2	-	SinCos and TTL Resolver	-
Connection X10/ Axis3 Enc1	-	-	SinCos and TTL EnDat/SSi HIPERFACE® BISS Resolver

Tab. 25: Comparison of encoder plug-in slots

5 Service

5.1 Technical support

In case of questions, suggestions, or issues, please contact our experts from Technical Support. You may reach out by phone or through the contact form on our homepage:

Technical Support | www.bucherautomation.com

Or email us:

support@bucherautomation.com

Please supply the following information when contacting Technical Support:

– Hardware revision and serial number
  The hardware revision and serial number is printed on the nameplate of the product.

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