

MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ALLEN-BRADLEY

1394C-SJT10-D

10 KW SERCOS SERVO SYSTEM MODULE

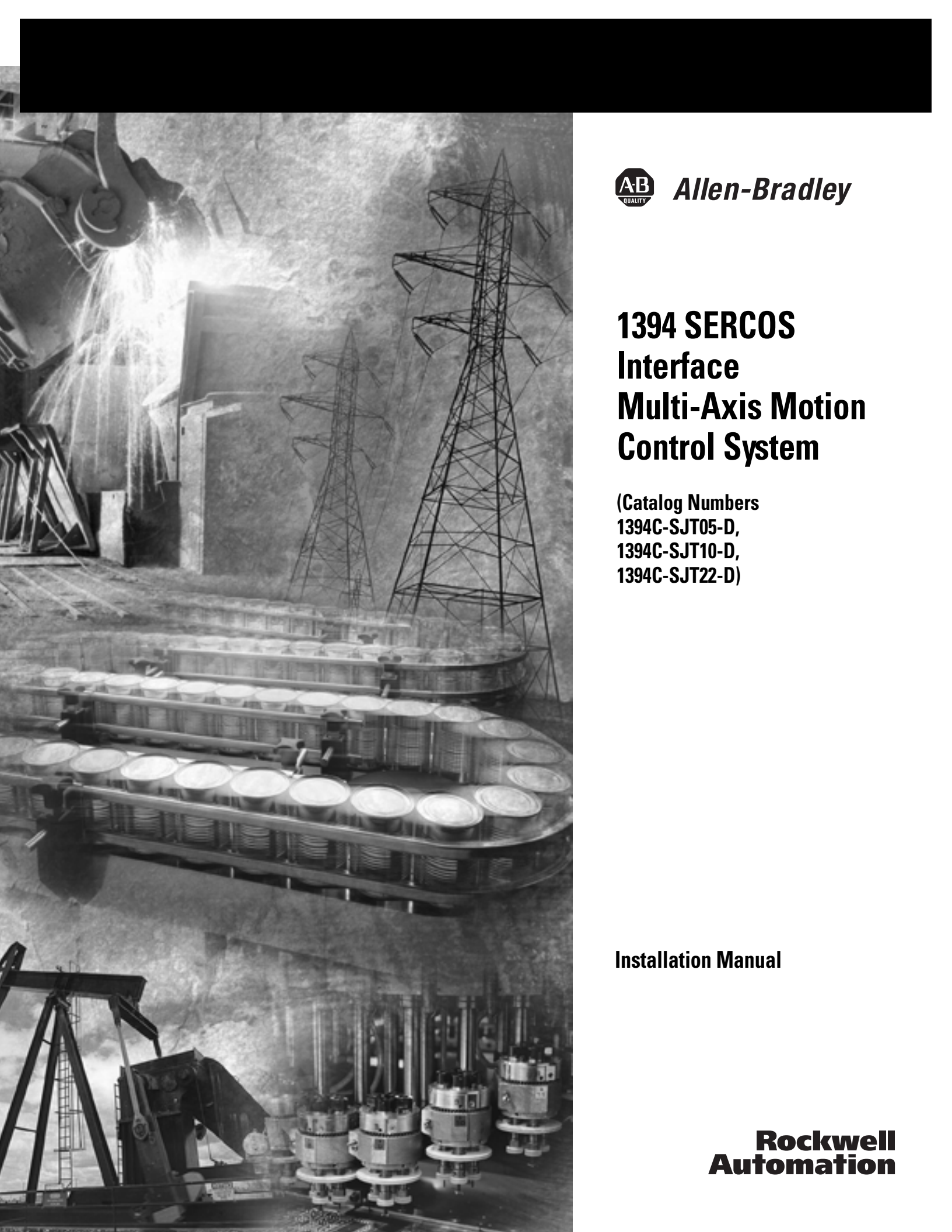
Used with the applicable Allen Bradley 1394 servo system configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Official Allen-Bradley document: 1394C-SJT10-D.pdf



Allen-Bradley

1394 SERCOS Interface Multi-Axis Motion Control System

(Catalog Numbers
1394C-SJT05-D,
1394C-SJT10-D,
1394C-SJT22-D)

Installation Manual

**Rockwell
Automation**

- Install the 1394 SERCOS interface system inside an enclosure. Run input power wiring (grounded to the enclosure) in conduit outside of the enclosure. Separate signal and power cables as shown in *Planning Your Panel Layout* of this chapter.

Low Voltage Directive

These units are tested to meet Council Directive 73/23/EEC Low Voltage Directive. The *EN 50178-1 Electronic Equipment for Use in Power Installations* and *EN 60204-1 Safety of Machinery-Electrical Equipment of Machines, Part 1-Specification for General Requirements* standards apply in whole or in part.

Refer to *Appendix B* of this document for interconnect information.

1394 System Component Overview

This section provides an overview of the 1394 system components and a typical installation.

1394 Component:	Catalog Numbers:	Description:
System Module	1394C-SJTxx-D	The 1394 multi-axis System Modules are available with 5, 10, or 22 kW continuous output and 360V/480V ac input power. Each system module accommodates up to four axis modules.
Axis Module	1394C-AMxx	The 1394 Axis Modules are available with 2, 3, 5, 15.6, and 23.8 kW continuous output.
ControlLogix/ SoftLogix Platforms	1756-MxxSE module 1784-PM16SE PCI card	The SERCOS interface module/PCI card serves as a link between the ControlLogix/SoftLogix platform and 1394 system. The communication link uses the IEC 61491 SErIAL Real-time COmmunication System (SERCOS) protocol over a fiber-optic cable.
RSLogix™ 5000 software	9324-RLD300ENE	RSLogix 5000 provides support for programming, commissioning, and maintaining the Logix family of controllers.
Servo Motors	MP-Series, 1326AB, and 1326AS servo motors	The MP-Series (low inertia) 460V, 1326AB (M2L/S2L), and 1326AB (resolver) motors are available for use with the 1394 SERCOS interface system.
Cables	Motor Power, Feedback, and Brake cables	Motor power, feedback, and brake cables include integral molded, bayonet style, quick connect/quick-release connectors at the motor. Power and brake cables have flying leads on the drive end and straight connectors that connect to servo motors. Standard feedback cables have a straight connector on the motor end and flying leads that wire to a feedback connector on the drive end.
	Fiber-Optic cables	SERCOS fiber-optic cables are available in enclosure only, PVC, nylon, and glass with connectors at both ends.
AC Line Filters	SP-74102-006-01	The SP-74102-006-01 three-phase AC line filter is suitable for 1394C-SJT05-D system modules.
	SP-74102-006-02	The SP-74102-006-02 three-phase AC line filter is suitable for 1394C-SJT10-D system modules.
	SP-74102-006-03	The SP-74102-006-03 three-phase AC line filter is suitable for 1394C-SJT22-D system modules.
External Shunt Modules	1394-SR10A	The Bulletin 1394-SR10A external passive shunt resistor is available when the 1394C-SJT05/10-D internal shunt capability is exceeded.
	1394-SR-xxxx	One Bulletin 1394 external passive shunt module is required for each 1394C-SJT22-D system module.

Note: Refer to *Appendix C* for a complete list of catalog numbers for the 1394 components listed above.

System Module Connector Pin-outs

The System Module connectors are described in the table below. System Module connector pin-outs and signal descriptions follow.

System Module Connectors

Description	Connector	Present on this 1394 System Module
Main Input Power	4-position connector housing	1394C-SJT05-D / 1394C-SJT10-D
Logic Power	2-position connector housing	
Shunt Power	3-position connector housing	
Logic, Shunt, and Main Input Power Terminal Block	8-position terminal block	1394C-SJT22-D
Single Point Bond Bar	5-position grounding bar	1394C-SJT05-D, 1394C-SJT10-D, or 1394C-SJT22-D
Motor/Auxiliary Feedback	13-position connector housing	
Relay Outputs	10-position connector housing	
Analog Outputs	9-position connector housing	
Discrete Input	8-position connector housing (4)	
SERCOS Transmit and Receive	SERCOS fiber-optic (2)	
DPI/SCANport	DPI/SCANport	

Power Wiring Requirements

Power wiring requirements are given in the tables below. Wire should be copper with 75° C (167° F) minimum rating, per NFPA 79 unless otherwise noted. Phasing of main input power is arbitrary and earth ground connection is required for safe and proper operation.

IMPORTANT

The National Electrical Code and local electrical codes take precedence over the values and methods provided.

1394 Power Wiring Requirements

Module	Description	Connects to Terminals	Recommended Wire Size mm ² (AWG)	Torque Value Nm (lb-in.)
System Module 1394C-SJT05-D or 1394C-SJT10-D	Main Input Power	U, V, W, PE ¹	6 (10)	0.56 - 0.62 (5.0 - 5.6)
	Input Logic Power	W1, W2	4 (12)	
	Shunt Resistor Connections	COL, INT, DC+	6 (10) ²	
System Module 1394C-SJT22-D	Main Input Power	U, V, W, PE ¹	10 (8)	2.21 - 2.66 (20.0 - 24.0)
	Input Logic Power	W1, W2	4 (12)	
	External Shunt Module Connections	DC+, COL	10 (8) ²	
System Module 1394C-SJTxx-D	Ground	Single Point Bond Bar	10 (8)	1.6 (14)
	Drive System OK and Brake Relay Circuits	Relay Outputs	0.2-4.0 (26-12)	
Axis Module 1394C-AM03, -AM04, and -AM07	Motor Power	U1, V1, W1, and PE2	Motor power cable depends on motor/drive combination, 6 (10) maximum	0.56 - 0.62 (5.0 - 5.6)
	Ground	PE1	6 (10)	
Axis Module 1394C-AM50, -AM75, -AM50-IH, and -AM75-IH	Motor Power	U1, V1, W1, and PE2	Motor power cable depends on motor/drive combination, 10 (8) maximum	1.55 - 2.0 (14.0 - 18.0)
	Ground	PE1	10 (8)	
Axis Module 1394C-AMxx and -AMxx-IH	Thermal Switch and Brake Filter Circuits	TB1/TB2	0.2-4.0 (26-12)	0.56 - 0.62 (5.0 - 5.6)

¹ The input power terminal designated PE is electrically common to the system module single point bond bar, so the ground connection at PE is optional. However, the ground connection at the single point bond bar is mandatory.

² 105° C (221° F), 600V.

Note: Refer to the section *Understanding External Shunt Connections* on page 3-34 for more information regarding the COL, INT, and DC+ connections.

Connecting Input Power

The system module provides terminating points for the main input power, logic power, feedback, and various other control signals. The slide-and-lock mechanism transfers power and commutation signals to each axis module. This procedure assumes you have the 1394 SERCOS interface system mounted on your panel and are ready to wire the input power.

Each individual application requires different wiring. This section provides guidelines for wiring your system. Because of the diversity of applications and systems, no single method of wiring is applicable in all cases.

IMPORTANT

When tightening screws to secure the wires, refer to the tables beginning on page 3-13 for torque values.

IMPORTANT

To ensure system performance, run wires and cables in the wireways as established in *Chapter 1*.

Refer to *Appendix B* for the 1394 interconnect diagrams.

If you have this System Module:	Then Go To:
1394C-SJT05-D (5 kW) or 1394C-SJT10-D (10 kW)	<i>Connecting Power Wiring for 5 and 10 kW System Modules</i> beginning below.
1394C-SJT22-D (22 kW)	<i>Connecting Power Wiring for 22 kW System Modules</i> beginning on page 3-17.

Connecting Power Wiring for 5 and 10 kW System Modules

The 1394C-SJT05-D and 1394C-SJT10-D system modules use connectors for wiring the main input power and logic power. You will wire the system using connector plugs that mate with connector housings. Refer to Figure 2.1 for the connector locations.

ATTENTION



To avoid personal injury and/or equipment damage ensure installation complies with specifications regarding wire types, conductor sizes, branch circuit protection, and disconnect devices. The National Electrical Code (NEC) and local codes outline provisions for safely installing electrical equipment.

Understanding External Shunt Connections

Follow these guidelines when wiring your Bulletin 1394 External Shunt Resistor/Module.

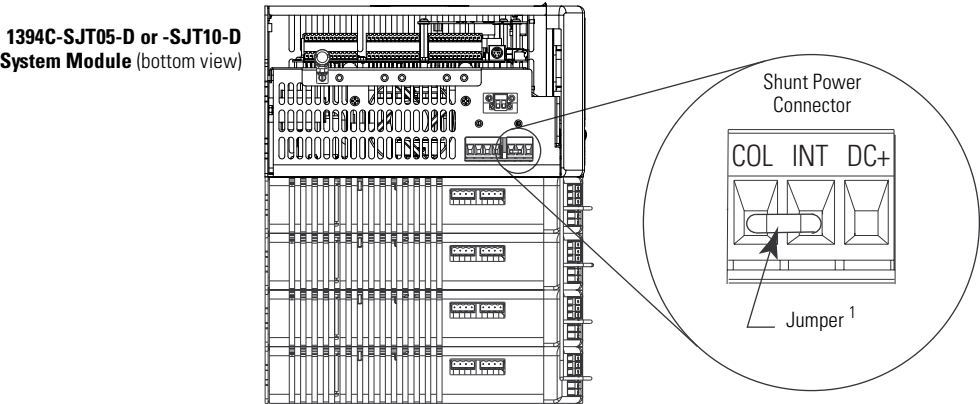
IMPORTANT When tightening screws to secure the wires, refer to the tables beginning on page 3-13 for torque values.

IMPORTANT To ensure system performance, run wires and cables in the wireways as established in *Chapter 1*.

Refer to *Appendix B* for the 1394 interconnect diagrams.

If your application requires an:	Catalog Number:	And you are wiring to this 1394C system module:	Then:
Internal Passive Shunt Resistor	N/A	1394C-SJT05-D or 1394C-SJT10-D	Verify the internal shunt jumper is in place between COL and INT, as shown in Figure 3.16.
External Passive Shunt Resistor	1394-SR10A		Remove the internal shunt jumper between COL and INT.
External Passive Shunt Module	1394-SRxxx	1394C-SJT22-D	- Refer to <i>Planning Your Panel Layout and Mounting Your External Shunt Resistor Kit</i> in <i>Chapter 1</i>. - Refer to <i>System Module Input Power Pin-outs</i> in <i>Chapter 2</i>. - Refer to <i>The Shunt Module Interconnect Diagrams</i> in <i>Appendix B</i>.

Figure 3.16
System Module Jumper



¹ This is the factory default jumper setting.

Power Specifications

This section contains power specifications for the 1394 SERCOS interface system.

System Module Power Specifications

The:	For the 1394C-SJT05-D is:	For the 1394C-SJT10-D is:	For the 1394C-SJT22-D is:
Rated AC input voltage	324-528V AC, 50/60 Hz Three phase	324-528V AC, 50/60 Hz Three phase	324-528V AC, 50/60 Hz Three phase
AC input current (A_{rms})	6.5A	13.0A	28.6A
Peak inrush current ^{1, 2}	8A	8A	8A
Line loss ride through	20 ms	20 ms	20 ms
Nominal bus output voltage	530/680V dc	530/680V dc	530/680V dc
Continuous power output	4/5 kW	8/10 kW	17/22 kW
Peak power output ³	28 kW	28 kW	136 kW
Efficiency	99%	99%	98%
Weight	10.68 kg (23.5 lb)	10.68 kg (23.5 lb)	12.9 kg (28.5 lb)
Continuous current output (A_{dc})	7.36A	14.73A	33.8A
Intermittent current output (A_{dc})	15.0A	29.46A	200A
Capacitance	220 μ F	345 μ F	660 μ F
Inductance	1000 μ H	750 μ H	500 μ H
Internal shunt resistor	200W continuous, 40,000W peak (two second maximum on time)		No internal Shunt Resistor

¹ 1394C-SJT05-D, -SJT10-D, and -SJT22-D system modules are limited to four contactor cycles per minute.

² Peak inrush current is limited by an internal 80 ohm resistor. The 8A peak inrush current for all Series C system modules will experience no more than a 40A peak loss (less 1 ms).

³ The peak power output rating is based on a current limit of 105% of two times the rated continuous current output for 600ms or the rated peak power output for a duration equal to the equivalent watt-seconds.

To avoid nuisance tripping, refer to the following table and select the appropriate combination of system module, supplementary circuit protection device, and axis modules.

Use System Module:	With Supplementary Circuit Protection Device:	And Axis Module Combination:
1394C-SJT05-D	1492-CB3-H300	Any combination of AM03 and AM04 up to 4 axis modules. Any combination of AM03, AM04, and AM07 where no more than two AM07s are being used. Use of other combinations of axis modules with this system module may result in nuisance tripping on power up due to a higher inrush current.
	A 1492 device is not recommended for this option.	Other combinations of AM07, AM50, and AM75s. Some local electrical codes require that the circuit breaker rating not exceed 400% of the full load device current. The inrush current draw of the 1394 in some combinations exceeds the 30A breaker and will result in nuisance tripping.
1394C-SJT10-D	1492-CB3-H500	All
1394C-SJT22-D	1492-CB3-H500	All

Fuse Specifications

System		Fuse Description	Rating
1394-SJT05 systems	Series A and B	Bussmann® FRS-R-20A or equivalent	600V ac, 20A
1394C-SJT05 systems	Series C and D	Bussmann KTK-R-20 or equivalent	600V ac, 20A
		Bussmann LPJ-SP 20 or equivalent	600V ac, 20A
1394-SJT10 systems	Series A and B	Bussmann FRS-R-30A or equivalent	600V ac, 30A
1394C-SJT10 systems	Series C and D	Bussmann KTK-R-30 or equivalent	600V ac, 30A
		Bussmann LPJ-SP 30 or equivalent	600V ac, 30A
1394x-SJT22 systems		Bussmann FRS-R-35 or equivalent	600V ac, 35A
		Bussmann LPS-RK-SP 40 or equivalent	600V ac, 40A
		Bussmann LPJ-SP 45 or equivalent	600V ac, 45A

Contactor (M1) Specifications

Contactor		1394-SJT05 and -SJT10 (Series A and B)	1394C-SJT05 and -SJT10 (Series C and D)	1394x-SJT22
Rating		600V ac, 43A ¹	600V ac, 23A	600V ac, 37A
Recommended types:	AC Coil Operation	Allen-Bradley 100-C43x10 ^{2,3}	Allen-Bradley 100-C23x10 ^{2,3}	Allen-Bradley 100-C37x10 ^{2,3}
	DC Coil Operation	Allen-Bradley 100-C43Zx10 ²	Allen-Bradley 100-C23Zx10 ²	Allen-Bradley 100-C37Zx10 ²

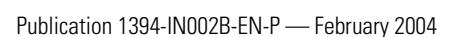
¹ Consider using a 60A contactor when the total capacitance of the axis modules is greater than 880 μ F.

² x indicates coil voltage.

³ A surge suppressor is required.

Within this section, you will find dimensions for the 1394 SERCOS interface system modules and axis modules.

Figure A.3
1394C-SJT05-D, 1394C-SJT10-D and 1394C-SJT22-D System Module

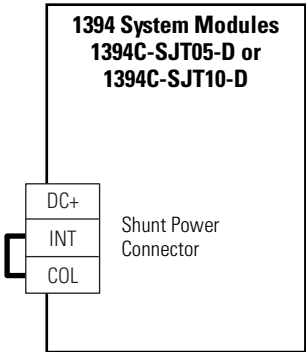


Shunt Module Interconnect Diagrams

In the figure below, the 1394 system module is shown wired for internal shunt operation. This is the factory default jumper setting.

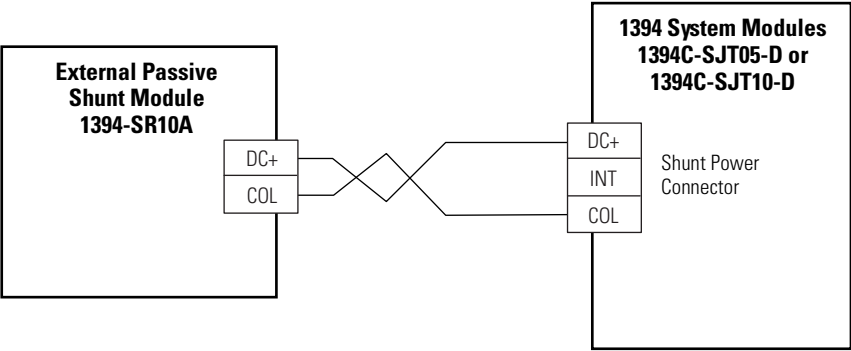
IMPORTANT Internal shunt operation is only present on the 1394 system modules listed in Figure B.3.

Figure B.3
Internal Shunt Interconnect Diagram



In the figure below, the 1394C-SJT05-D and -SJT10-D system modules are shown wired with the optional external shunt resistor.

Figure B.4
External Shunt Module Interconnect Diagram (optional)



Catalog Numbers and Accessories

Chapter Objectives

This appendix lists the 1394 system components and accessory items in tables by catalog number, providing detailed descriptions of each. This appendix describes catalog numbers for:

- 1394 System Modules
- 1394 Axis Modules
- RSLogix 5000 Software
- AC Line Filters
- External Shunt Modules
- Cables
- 1394 Accessories

Contact your local Allen-Bradley sales office for additional information. Refer to the *Motion Control Selection Guide* (publication GMC-SG001x-EN-P) for detailed information on products.

1394 System Modules

1394 system modules have power ratings of 5, 10, and 22 kW. Available 1394 system modules are listed in the table below.

Description	Catalog Number
System Module, 5 kW with SERCOS interface, Series C, controls up to four axes	1394C-SJT05-D
System Module, 10 kW with SERCOS interface, Series C, controls up to four axes	1394C-SJT10-D
System Module, 22 kW with SERCOS interface, Series C, controls up to four axes	1394C-SJT22-D