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 Produced by : - CTC
 Travellers Lane, Hatfield, Herts, AL10 8XB, UK
 Author: Matt Wills

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This Data sheet covers the physical wiring configuration of the FX3U-20SSC-H (Hereinafter referred to as 20SSC-H) module to MRJ3 Servo Amps and external I/O for a 2 axis system.

Wiring

Wiring requirements for MR-J3-B type servo amplifiers (d01 and d02)

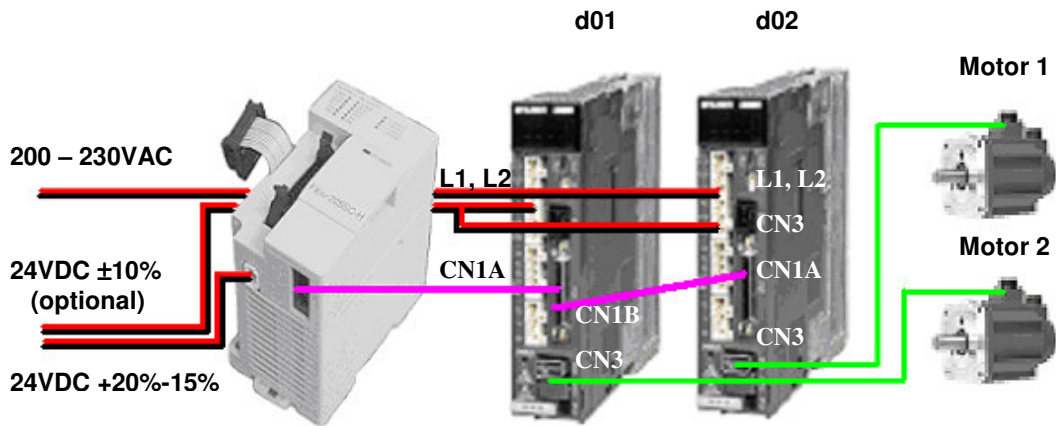
- 200 - 230VAC to L1 and L2 on both servo amplifiers (d01 and d02)
- Fibre optic cabling CN1A (d01) ↔ 20SSC-H; CN1B (d01) ↔ CN1A (d02)
- U, V, W (d01) → motor 1; U, V, W (d02) → motor 2
- CN2 (d01) → motor 1; CN2(d02) → motor 2

Optional:

- 24VDC ±10% to CN3 on both servo amplifiers (d01 and d02)
 (can be powered by the FX_{3U} base unit 24V external power supply)

Wiring requirements for FX_{3U}-20SSC-H

- 24VDC +20%-15% to power connector
- Fibre optic cabling 20SSC-H ↔ CN1A (d01)
- Extension cable to right-hand side of FX_{3U} (uses 100mA from the 5V DC bus)

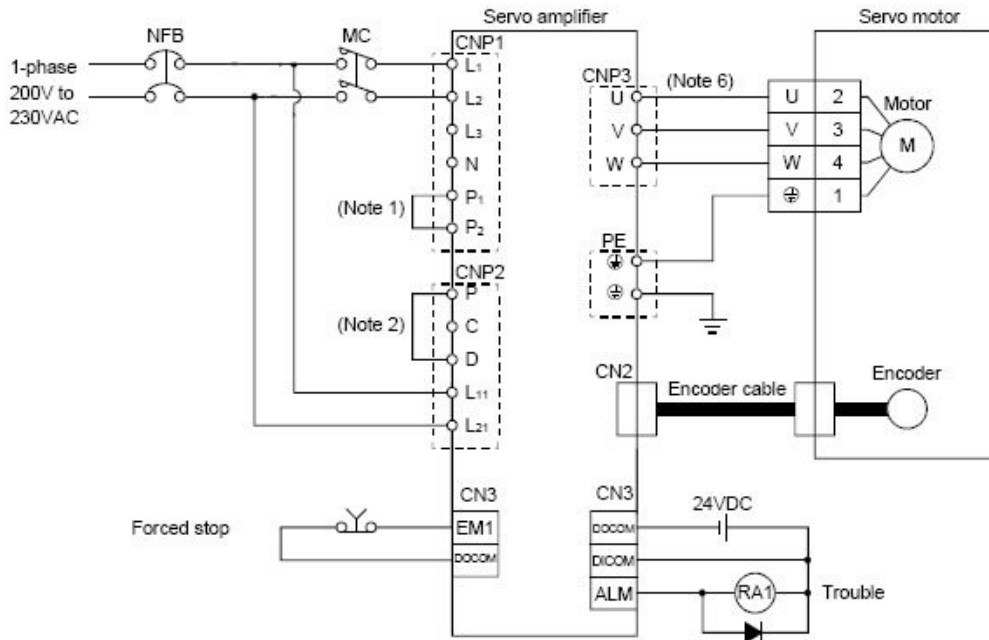


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Amplifier Power Circuit:

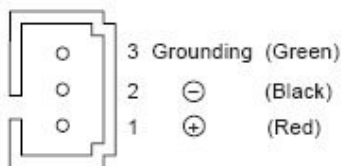
(Single Phase 200-230VAC)



Note 1: Always connect P1 – P2 (Factory Wired)

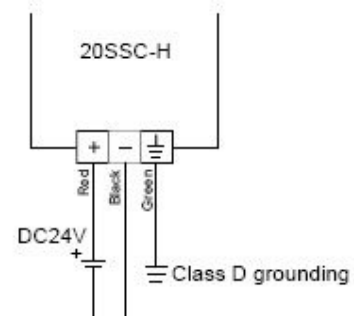
Note 2: Always connect P – D (Factory Wired)

20SSC-H 24VDC Circuit:



20SSC-H 24VDC Cable:

Model name	Length	Remarks
FX2NC-100MPCB	1m	Accessory of 20SSC-H

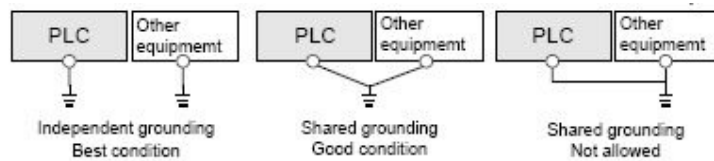


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Grounding:

Ground the cables as follows:



Input cable and Terminal Block:

Applicable connector uses the 20-Pin (1-key) socket complying with MIL-C-83503.

Input Cables from Mitsubishi Electric:

Model name	Cable length	Remarks
FX-16E-□ ¹ CAB	1.5, 3, 5m	Flat cable (with tube) provided with a 20-pin connector at both ends
FX-16E-□ ¹ CAB-R		Round multi-conductor cable provided with a 20-pin connector at both ends
FX-16E-500CAB-S	5m	Bulk cable with 20-pin connector provided on a single end (cable color: red)

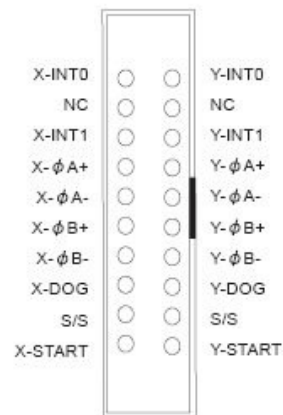
Terminal Block:

Model name	Application and remarks
FX-16E-TB	Converts input connector to terminal block

Note: The FX-32E-TB can also be used for a 2 x 20SSC-H (4 Axis) System.

Pin Array of the Input Connector:

Connector pin array (aperture side)



Terminal name	Description	Terminal name	Description
X-INT0	Interrupt input (for X axis)	Y-INT0	Interrupt input (for Y axis)
NC	Not used	NC	Not used
X-INT1	Interrupt input (for X axis)	Y-INT1	Interrupt input (for Y axis)
X-φA+	Input terminal for A-phase input of 2-phase pulse (for X axis)	Y-φA+	Input terminal for A-phase input of 2-phase pulse (for Y axis)
X-φA-	Common terminal for A-phase input of 2-phase pulse (for X axis)	Y-φA-	Common terminal for A-phase input of 2-phase pulse (for Y axis)
X-φB+	Input terminal for B-phase input of 2-phase pulse (for X axis)	Y-φB+	Input terminal for B-phase input of 2-phase pulse (for Y axis)
X-φB-	Common terminal for B-phase input of 2-phase pulse (for X axis)	Y-φB-	Common terminal for B-phase input of 2-phase pulse (for Y axis)
X-DOG	Near-point DOG input terminal (for X axis)	Y-DOG	Near-point DOG input terminal (for Y axis)
S/S	Power input terminal (START, DOG, INT0 and INT1) 24VDC. Pins that have the same name (S/S) are shorted inside.	S/S	Power input terminal (START, DOG, INT0 and INT1) 24VDC. Pins that have the same name (S/S) are shorted inside.
X-START	START input terminal (for X axis)	Y-START	START input terminal (for Y axis)

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Terminal layout of FX-16E-TB connected to input connector:

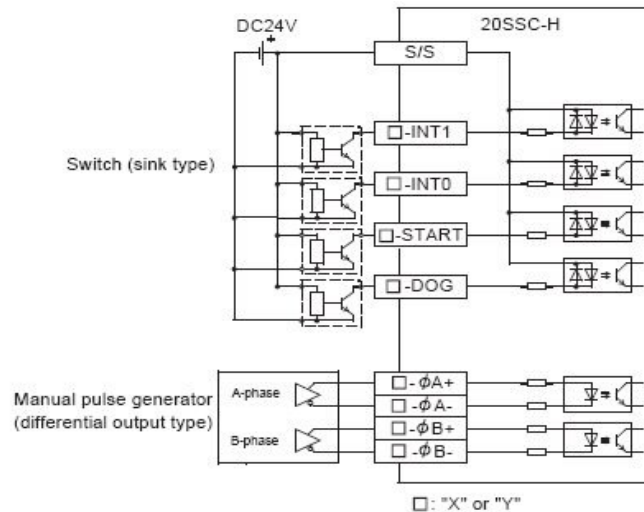
Y-START	•	X-φA+	S/S ¹	X-φB+	X-DOG	S/S ¹	•	Y-φA+	S/S ¹	Y-φB+	Y-DOG	S/S ¹
X-START	X-INT0	X-INT1	S/S ¹	X-φA-	X-φB-	S/S ¹	Y-INT0	Y-INT1	S/S ¹	Y-φA-	Y-φB-	S/S ¹

Note: The **S/S** terminals are connected together inside the FX-16E-TB.

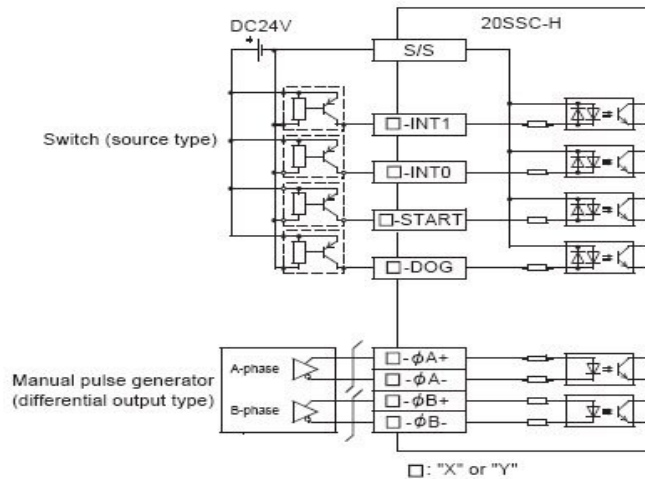
Input Wiring:

An external 24VDC Power Supply is necessary for the **DOG, START, INT0, INT1** and **S/S** Terminals.

Sink:



Source:



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Forward / Reverse Rotation Limits. (LSF, LSR)

The 20SSC-H does not have a terminal for connecting the Forward or Reverse Rotation Limit switch. Connect the LSF and LSR limit switches in the following ways:

Option 1:

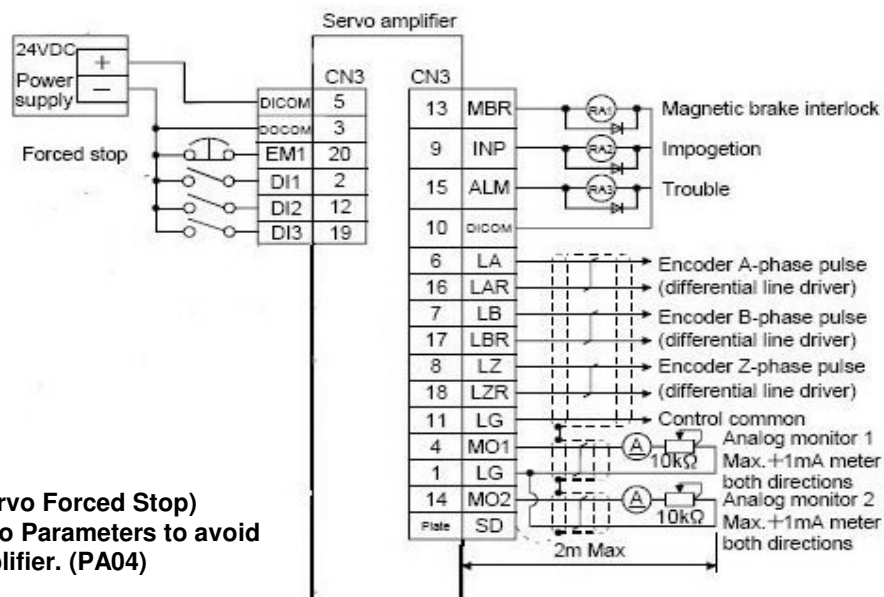
Limits wired to standard inputs on the control PLC and mapped to Control Data Buffer Memory area of 20SSC-H module.

BFM Number		Bit Number	Setting Item	Description	Detection*1	Default
X-axis	Y-axis					
BFM #518	BFM #618	b0	Error reset	Set this to recover from errors and clear the following information. - Error BFM numbers (BFM #6, BFM #106) - Status information - Occurrence of an error (b5) - Error code (BFM #29)	Edge	H0000
		b1	STOP (deceleration stop)	When this bit is ON during positioning operation, decelerate to stop. →For details on the stop command, refer to Section 7.4	Level	
		b2	Forward rotation limit (LSF)	Set this to perform a deceleration stop while outputting pulses for forward rotation. →For details on the forward rotation limit (LSF), refer to Subsection 7.3.2	Level	
		b3	Reverse rotation limit (LSR)	Set this to perform a deceleration stop while outputting pulses for reverse rotation. →For details on the reverse rotation limit (LSR), refer to Subsection 7.3.2	Level	
		b4	Forward rotation JOG	Pulses for forward rotation are output while this is set. →For details on the JOG operations, refer to Section 8.2	Level	
		b5	Reverse rotation JOG	Pulses for reverse rotation are output while this is set. →For details on the JOG operations, refer to Section 8.2	Level	

Use Bits 2 and 3 for LSF and LSR Control.

Option 2:

Limits wired directly to CN3 of MR-J3 Amplifier.



Note:

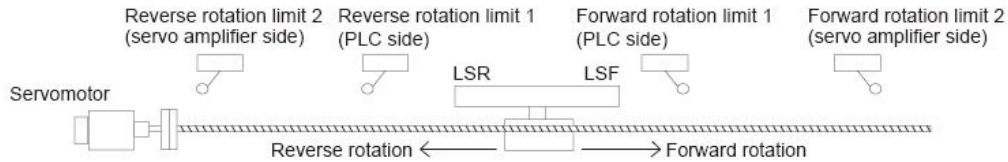
- DI1 – FLS
- DI2 – RLS
- DI3 – DOG

Make EM1 (Servo Forced Stop) Invalid in Servo Parameters to avoid wiring on Amplifier. (PA04)

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Handling the Forward Rotation Limit and Reverse Rotation Limit:

Consider the diagram below:



Description of FLS/RLS functions:

Limit		Stopping action	Description	Reference
Servo amplifier	Forward rotation limit 2, reverse rotation limit 2	Deceleration to stop	Specify the action limit so that no damage is caused to the machine that decelerates after activation of a limit switch until it is stopped. Connect without fail for safety.	Subsection 7.3.1
PLC	Forward rotation limit 1, reverse rotation limit 1	Deceleration to stop	This limit switch is necessary for retraction with the PLC if a DOG search function is used in zero return operation or if the limit switch is activated at the forward or reverse rotation limit modes in other than zero home operation. Provide at positions so that the limit switch is activated before forward rotation limit 2 or reverse rotation limit 2 connected with the servo amplifier.	Subsection 7.3.2
Software forward rotation limit Software reverse rotation limit		Deceleration to stop	Operation limit based on the current address that is effective after mechanical zero return. Specify at addresses that activation is caused before forward rotation limit 1 or reverse rotation limit 1 connected with the PLC.	Subsection 7.3.3

If DOG search Function is required for use then the FLS/RLS limits must be wired into the PLC and mapped to the Control Data BFM.

DOG search is not available if the FLS/RLS limits are only wired to the MR-J3 Amplifier.

SSCNET III Cable

SSCNET III Cable is made from Optical Fibre.

If a force is applied to the optical fibre such as a major shock, lateral pressure, haul, sudden bending or twist, its inside distorts or breaks and optical transmission will not be available.

Minimum Bend Radius:

SSCNET III cable	Minimum bend radius [mm (inches)]
MR-J3BUS□ M	25 (0.98")
MR-J3BUS□ M-A	Reinforced film cable : 50 (1.97") Code part : 25 (0.98")
MR-J3BUS□ M-B	Reinforced film cable : 50 (1.97") Code part : 30 (1.18")