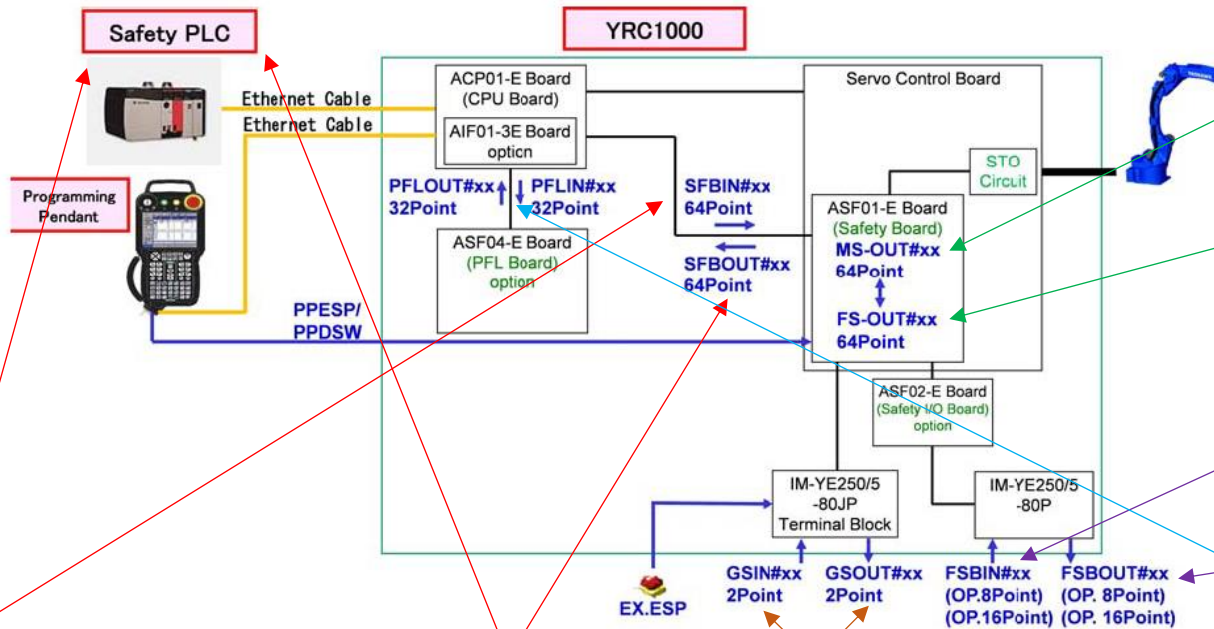


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Allocating Functional and Machine Safety Signals

The Functional and Machine Safety signals must be manually configured to meet the user’s safety needs. Because all user’s integration needs vary, this is not setup automatically before shipping. To map a functional safety function output to the input of another functional safety function, such as the output of a robot range limit to the speed limit function, the signals must be defined and then mapped through the Safety Logic Circuit. This must be done in SAFETY MODE (password: 16 - 5’s).

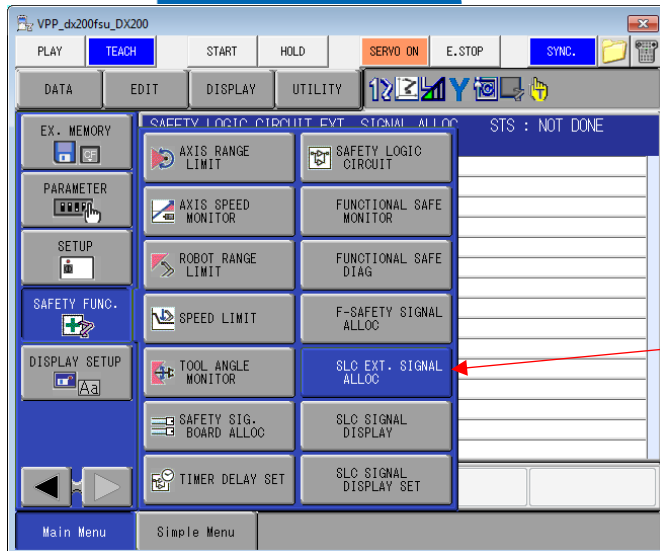
I. Define the signals based on your application needs.



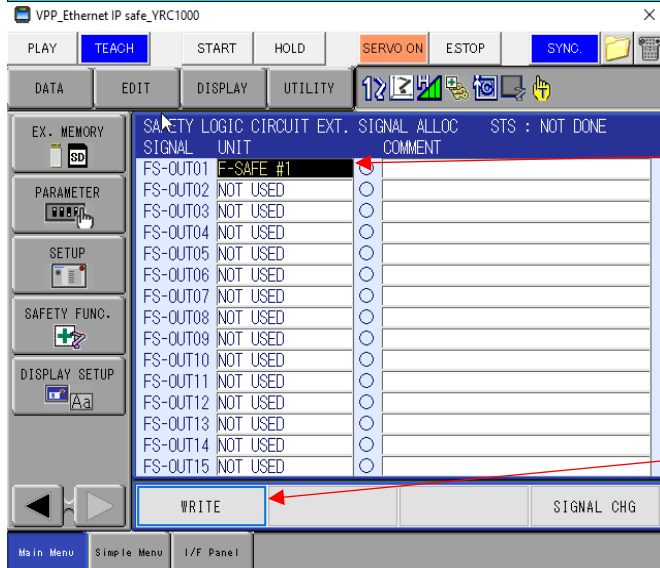
- MS-OUT#XX**
Can define up to 64 signals from the Machine Safety board. Can be used as an output in the SLC or as an input in the FSU file.
- FS-OUT#XX**
Can define up to 64 signals from the Functional Safety Board to the Machine Safety board. This is set as an output in an FSU file which can be used in the SLC.
- FSBIN#XX**
Can define up to 8 dual channel safety inputs to trigger an FSU file.
- FSBOUT#XX**
Can define up to 8 dual channel safety outputs as an output in an FSU file.

<p>SFBIN#XX (Only available with EIP-SAFE) Can define up to 64 safety fieldbus inputs which can be sent from a safety PLC and then used in the SLC or in an FSU file.</p>	<p>SFBOUT#XX (Only available with EIP-SAFE) Can define up to 64 safety fieldbus outputs which can be used in the FSU file or in SLC and then sent to a safety PLC.</p>	<p>GSIN#XX and GSOUT#XX Can define up to two dual channel safety inputs and outputs on the Machine Safety board.</p>	<p>PFLIN#XX and PFLOUT#XX (Only available with HC10 & DT) Can define up to 32 Power Force Limiting inputs and outputs</p>
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With the controller in SAFETY MODE, Select SAFETY FUNC. /SLC EXT.SIGNAL ALLOC.

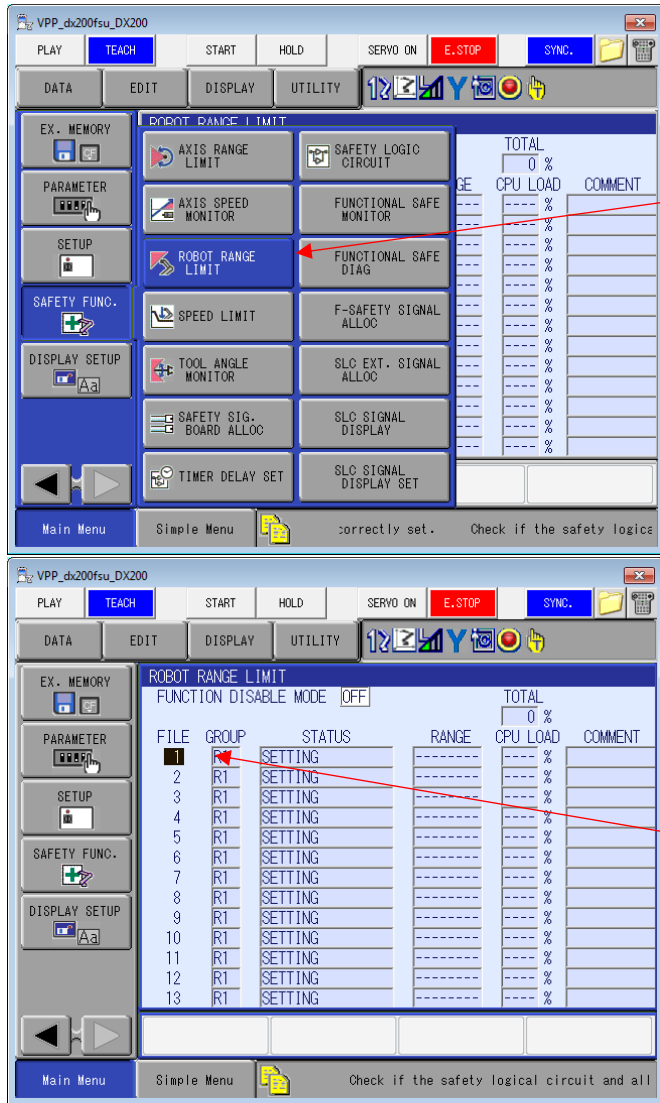


Select the signal to be defined for FS-OUT01 - FSOUT64, in this case FS-OUT01 has been set to be used within an FSU file.

WRITE then **CONFIRM**
(DO NOT MISS THIS STEP!)

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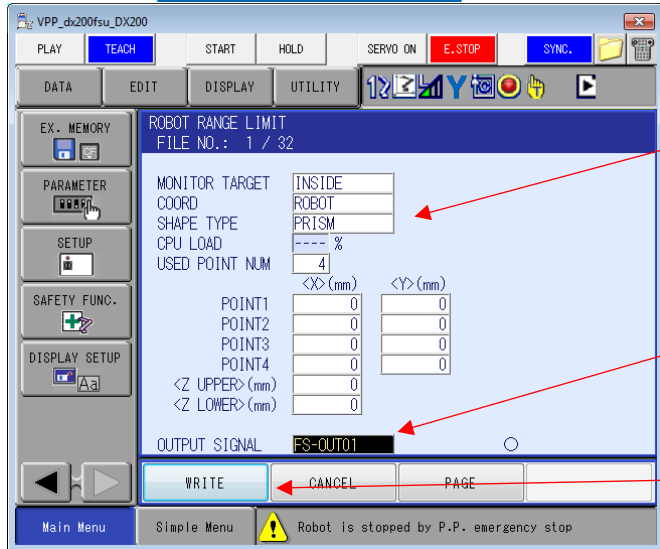
II. Setup robot range limit output.



With the controller in SAFETY MODE, Select SAFETY FUNC. /ROBOT RANGE LIMIT

Select the Robot Range Limit file to use (1-32).

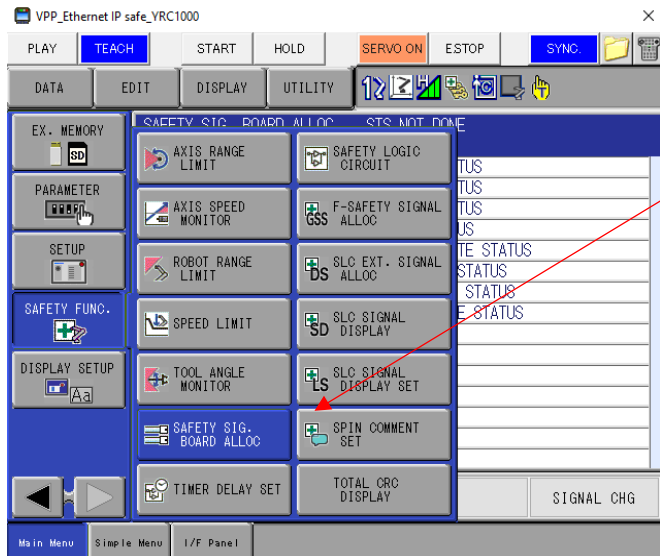
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Setup Robot Range Limit as required for the application.

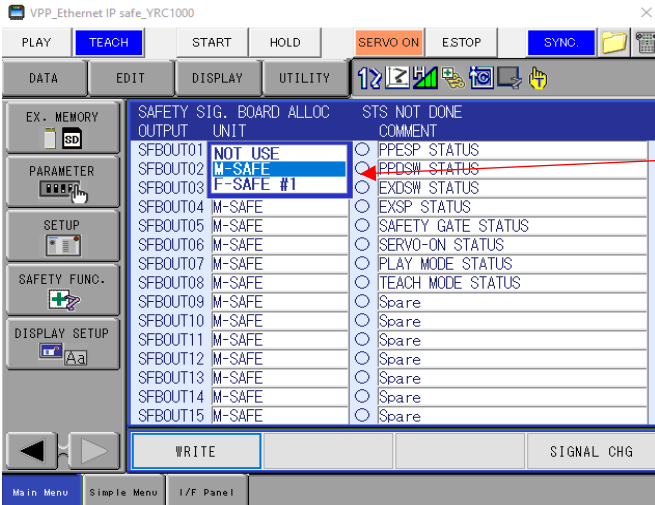
Select the FS-OUT01 (1-64 whichever signal was defined above).

YES, then **WRITE** then **CONFIRM** (DO NOT MISS THIS STEP!)



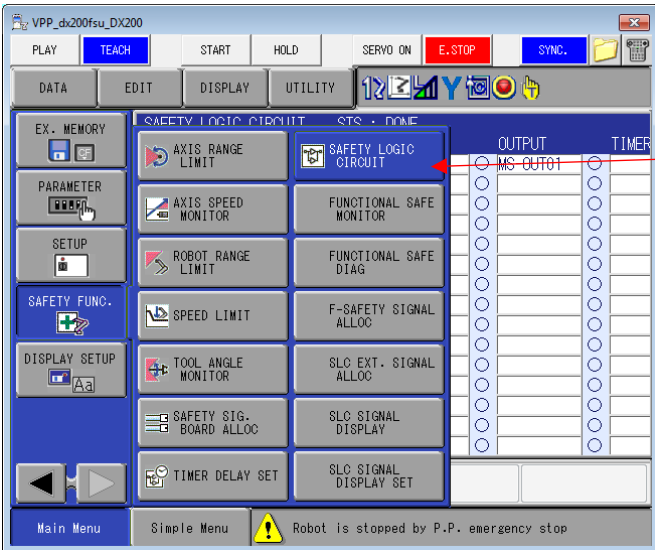
If using EIP-SAFE you will need to allocate the SFBOU signals here first. If using FSOUT or FSBOU's continue to section III.

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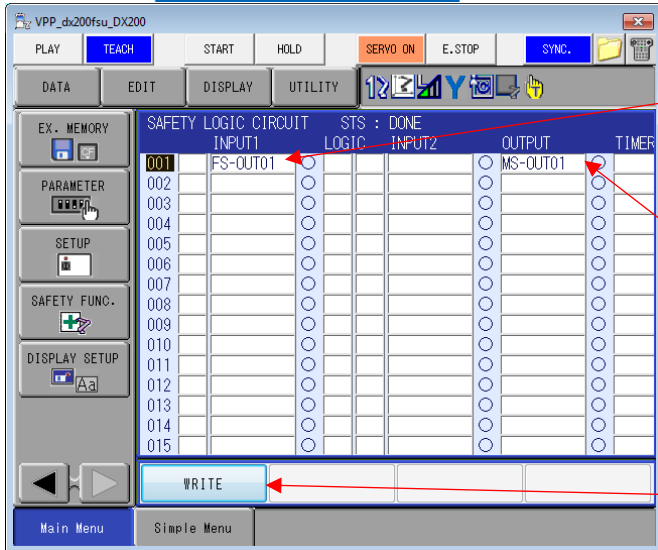
M-SAFE = Signal can be used in the safety logic circuit
 F-SAFE #1 Signal can be used with control group R1
 F-SAFE #2 Signal can be used with control group R2
 F-SAFE ALL USE Signal can be used in the entire safety circuit

III. Define the Safety Logic Circuit.



With the controller in SAFETY MODE, Select SAFETY FUNC. /SAFETY LOGIC CIRCUIT

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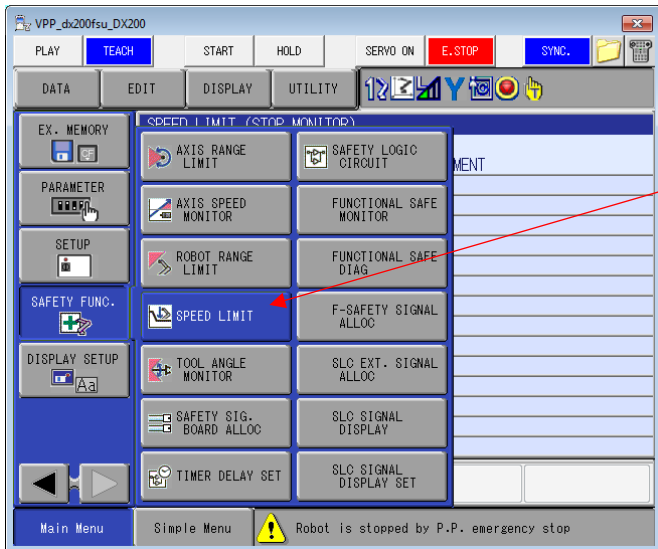


Set INPUT1 to FS-OUT01 (or whichever one was defined above)

Set OUTPUT to MS-OUT01 (1 to 64). This step is required to map the FS-OUT## to a MS-OUT##. The MS-OUT## can now be used as an input signal to a Functional Safety Function, such as the SPEED LIMIT FUNCTION.

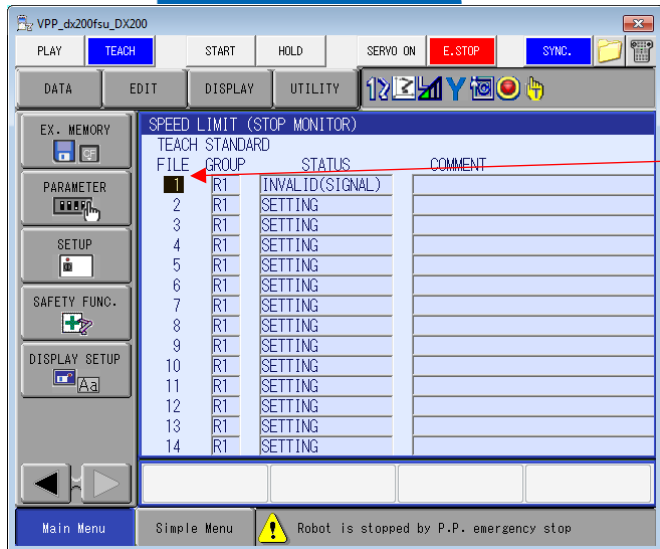
WRITE then **CONFIRM**
(DO NOT MISS THIS STEP!)

IV. Setup speed limit inputs.

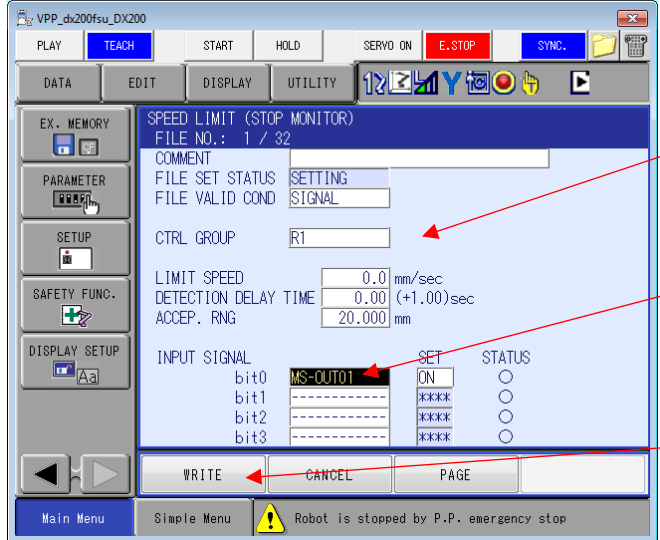


With the controller in SAFETY MODE, Select SAFETY FUNC. /SPEED LIMIT

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Select the SPEED LIMIT file to use (1-32).



Set SPEED LIMIT File as required for the application.

Select the MS-OUT01 (1-64 whichever signal was defined above).

WRITE then **CONFIRM**
(DO NOT MISS THIS STEP!)

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Additional information on Functional, Machine and Ethernet Safety is available for the controller models listed on Motoman.com. Links are provided below.

Controller	Manual Name / Link
DX200	Functional Safety
DX200	Ethernet IP Safety
DX200	Machine Safety Instructions
YRC1000	Machine Safety Instructions
YRC1000	Functional Safety
YRC1000	Ethernet IP Safe