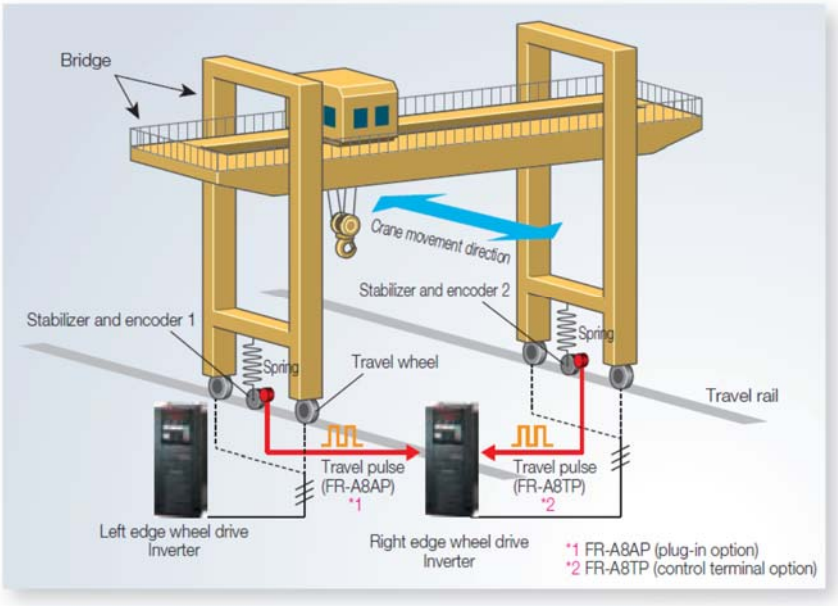
Explanation of the operation for the anti-crab function (position error correction)

[System configuration]



[Operation outline]

By inputting pulses of two encoders into one inverter, the speed of the both axes are adjusted to be the same based on the difference of cumulative pulse monitor values.

[How to use the sample program]

<Sample program overview>

File name	Description	Model	Programming tool
vol1_anti_crab_eng_a.fgw	Ladder program	FR-A800	FR Configrator2 (Developer)

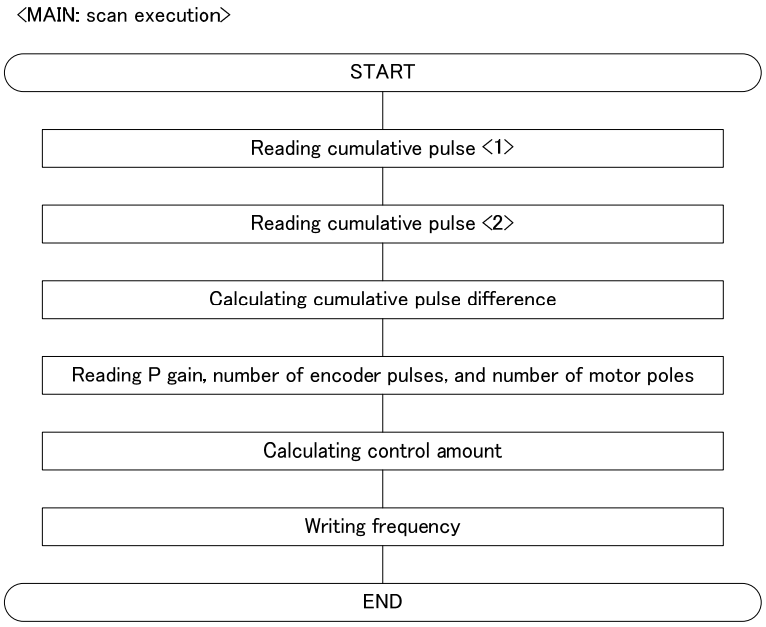
<Startup procedure>

(1)Decompress the downloaded file to a folder.
(2)Double click the file and start up each programming tool.
(3)The language setting of the ladder programs is initially set to Japanese.
To change the language setting, select [Tool] -> [Language Selection] and set the language to the desired language.
(4)Write the program to the FR-A800.
(5)After the writing completes, reset the FR-A800.

<Operation method>

(1)Set "250" (initial value) in Pr.1150 (Anti-crab gain).
Set Pr.1151 (Number of motor poles), Pr.1152 (Electronic gear numerator), Pr.1153 (Electronic gear denominator), and Pr.1154 (Number of encoder pulses) according to the usage conditions.
(2)Turn ON the SQ signal to set the PLC function in the RUN state.
(3)The ladder program can be executed by turning ON the X3 signal (terminal RM).
(4)For operating the right edge wheel driving inverter, set the frequency command value to "0" and turn ON the STF when Pr.79 = "3" (combined operation mode).
(5)For operating the left edge wheel driving inverter, apply a normal frequency command.
(6)Adjust the Pr.1150 (Anti-crab gain) setting as required.

[Circuit structure of the sample ladders]

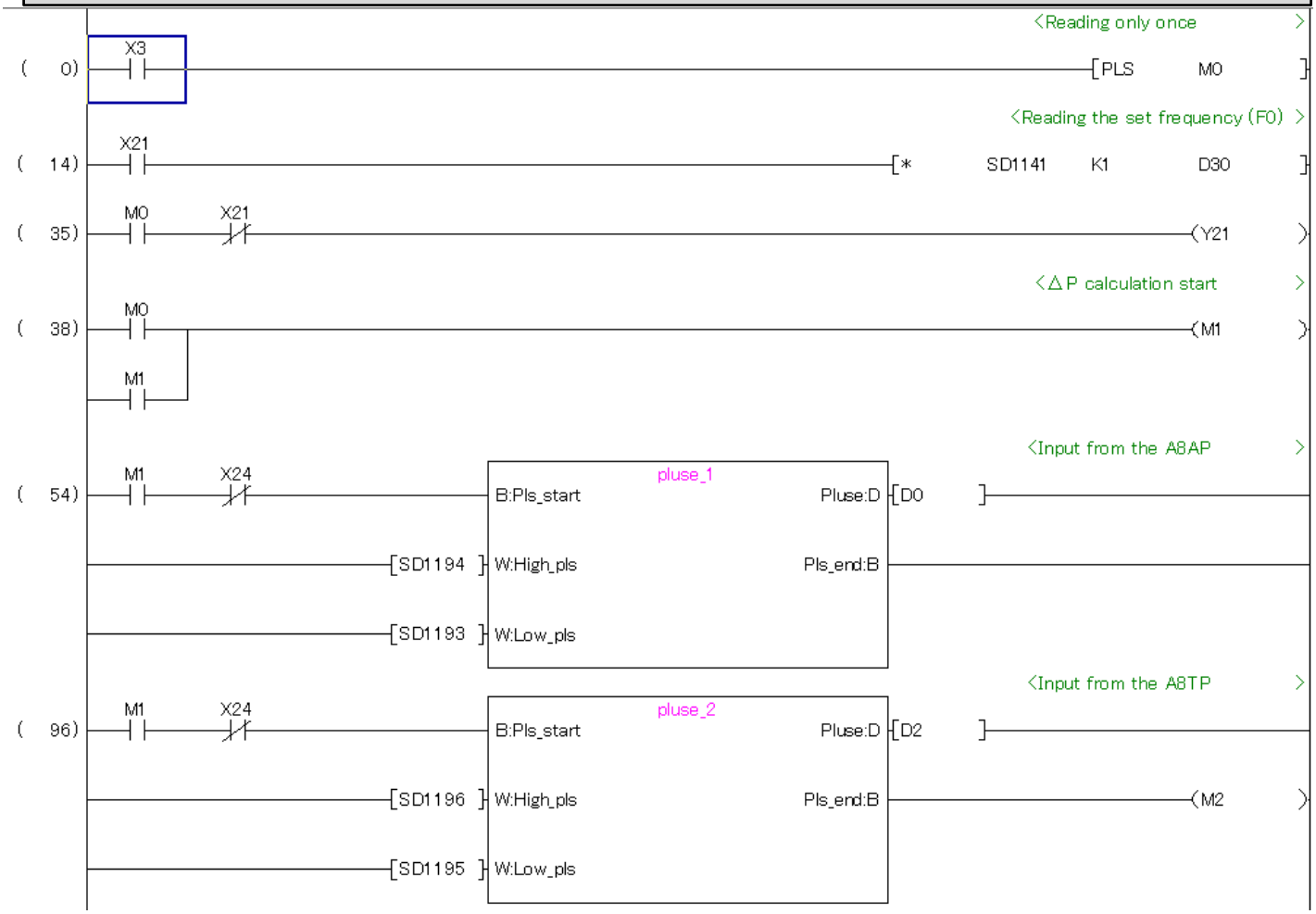


[Devices]

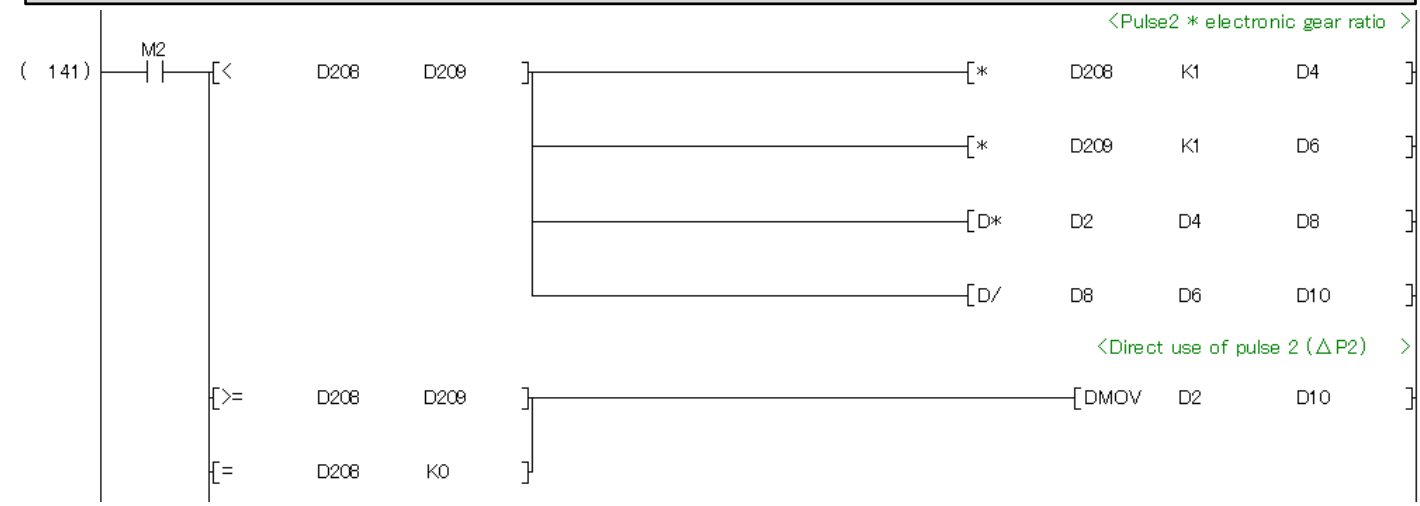
Device No.	Description	Device No.	Description	Type
M0	Pulse reading command	D0	Encoder 1 pulse	32 bits
M1	Encoder 1 pulse reading completion	D2	Encoder 2 pulse	32 bits
M2	Encoder 2 pulse reading completion	D4	Electronic gear numerator	32 bits
M3	Number of poles calculation command	D6	Electronic gear denominator	32 bits
M4	Number of poles judgment 1	D8	During calculation of encoder 2 gear ratio	32 bits
M5	Number of poles judgment 2	D10	Calculation result of encoder 2 gear ratio	32 bits
M6	Control amount calculation	D12	Pulse difference	32 bits
M7	Difference value compensation command	D14	Number of encoder pulses PPR	32 bits
M8	Writing command	D16	Proportional gain	32 bits
M9	Writing judgment	D18	Number of motor poles	32 bits
		D20	During calculation of frequency command value 1	32 bits
		D22	During calculation of frequency command value 2	32 bits
		D24	During calculation of frequency command value 3	32 bits
		D26	Frequency command	32 bits
		D28	Last frequency command excess number	32 bits
		D30	Encoder 1 pulse positive number	32 bits
		D32	Encoder 2 pulse positive number	32 bits
		D206 (Pr.1150)	Proportional gain	16 bits
		D207 (Pr.1151)	Number of motor poles	16 bits
		D208 (Pr.1152)	Electronic gear numerator	16 bits
		D209 (Pr.1153)	Electronic gear denominator	16 bits
		D210 (Pr.1154)	Number of encoder pulses PPR	16 bits

[Sample ladder diagrams]

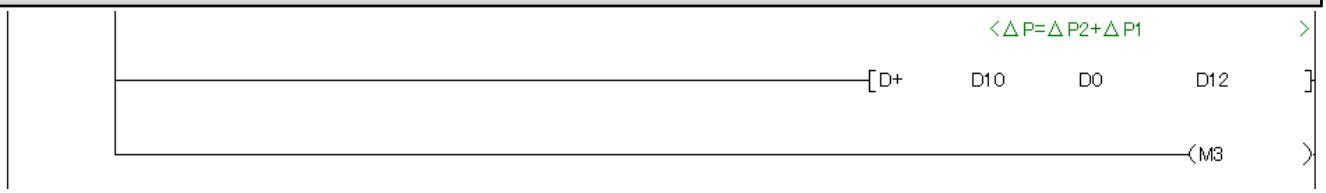
Reading cumulative pulse



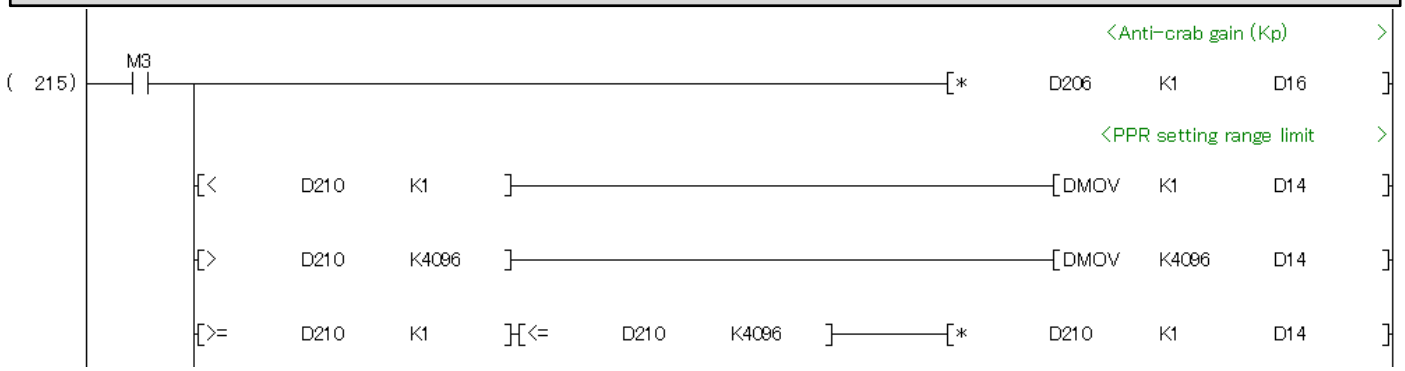
Processing electronic gear



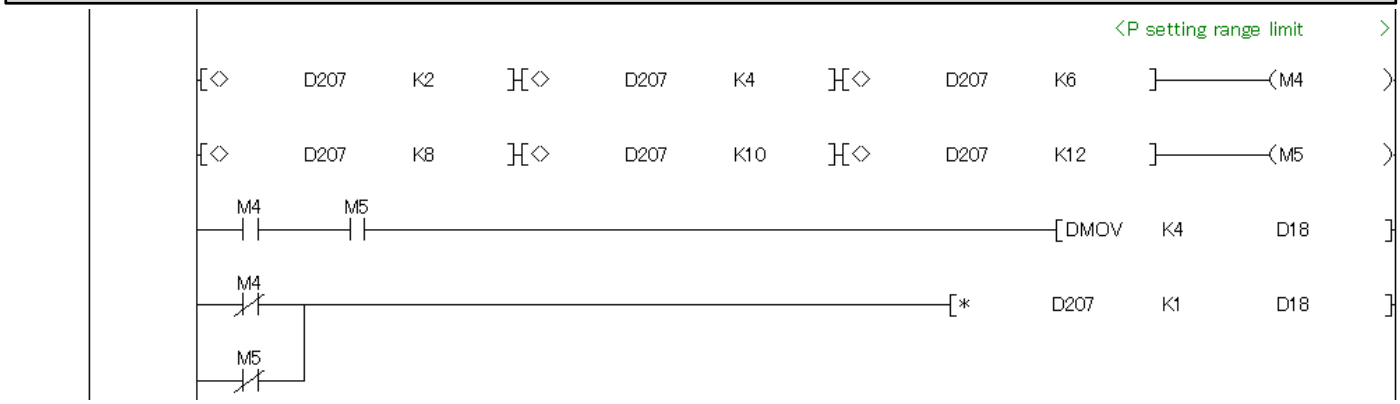
Calculating cumulative pulse difference



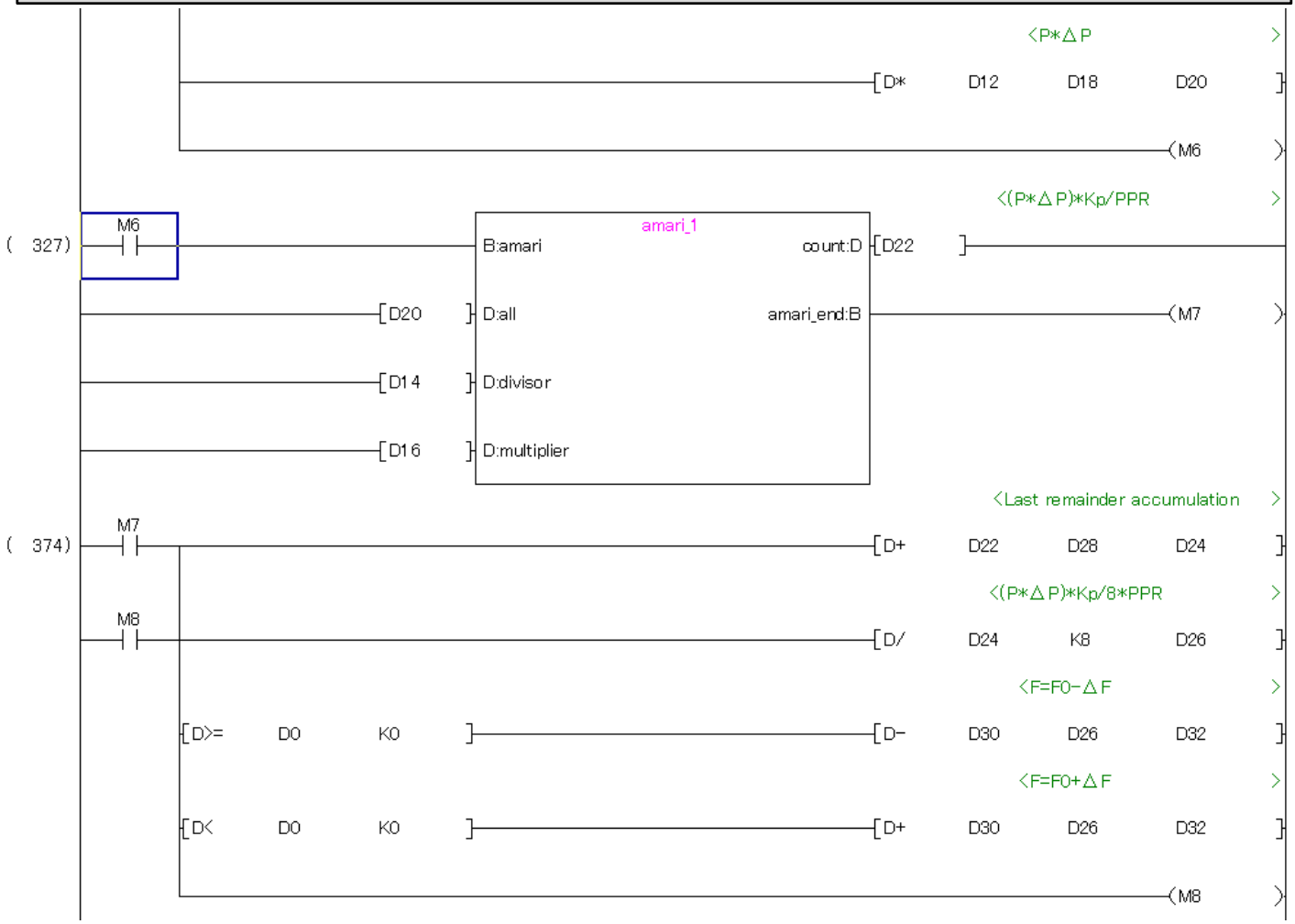
Reading P gain and number of encoder pulses



Reading number of motor poles



Calculating control amount



Writing frequency command

*For using the sample program in the actual system, verify sufficiently that the system can be controlled properly.