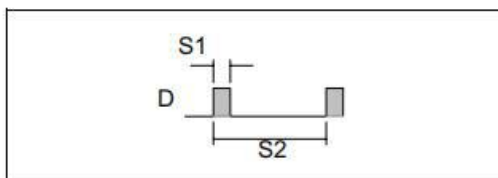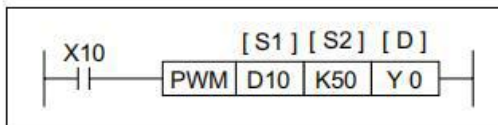# Pulse Width Modulation

Conventional Pulse Width Modulation

1. Only Y0 and Y1 are supported (please select transistor MT output), and the instruction fully complies with Mitsubishi standard usage.
2. There is no limit to the pulse width period, in milliseconds (ms).

Programming reference

Mnemonic	Function	Operands			Program steps
		S1	S2	D	
PWM FNC 58 (Pulse width modulation)	Generates a pulse train with defined pulse characteristics	K, H, KnX, KnY, KnM, KnS, T, C, D, V, Z Note: S1 S2		Y Note: FX0(S)/FX0N users: Y001 only ⊠. FX users: any YPPP. FX2N(C) users: Y000 or Y001 only ⊠	PWM: 7 steps

PULSE-P					16 BIT OPERATION					32 BIT OPERATION				
FX0(s)	FX0N	FX	FX(2C)	FX2N(C)	FX0(s)	FX0N	FX	FX(2C)	FX2N(C)	FX0(s)	FX0N	FX	FX(2C)	FX2N(C)

Operation:

A continuous pulse train is output through device D when this instruction is driven. The characteristics of the pulse are defined as:
The distance, in time (msec), between two identical parts of consecutive pulses (S2).
And how long, also in time (msec), a single pulse will be active for (S1).

Points to note:

a) Because this is a 16 bit instruction, the available time ranges for S1 and S2 are 1 to 32,767.

b) A calculation of the duty cycle is easily made by dividing S1 by S2. Hence S1 cannot have a value greater than S2 as this would mean the pulse is on for longer than the distance between two pulses, i.e. a second pulse would start before the first had finished. If this is programmed an error will occur.
   This instruction is used where the length of the pulse is the primary concern.

c) The PWM instruction may only be used once in a users program.

d) Because of the nature of the high speed output, transistor output units should be used with this instruction. Relay outputs will suffer from a greatly reduced life and will cause false outputs to occur due to the mechanical 'bounce' of the contacts. To ensure a 'clean' output signal when using transistor units, the load current should be 200mA or higher. It may be found that 'pull up' resistors will be required.

Special customized PWM - for analog output

The following parameters are required for custom selection:
1. Provide controller type and required voltage;
2. Provide a fixed frequency;
3. Provide a pulse width range;
4. Confirm the order to microsecond (μ s) level or millisecond (ms) level [default is millisecond (ms)
level;
5. Providing a range of digital quantities corresponding to the range of motion of the controller;
6, confirm the custom several PWM; up to 8 channels of PWM can be customized (according to the customer
Select the model to do several analog outputs to do a few fixed-frequency PWM).
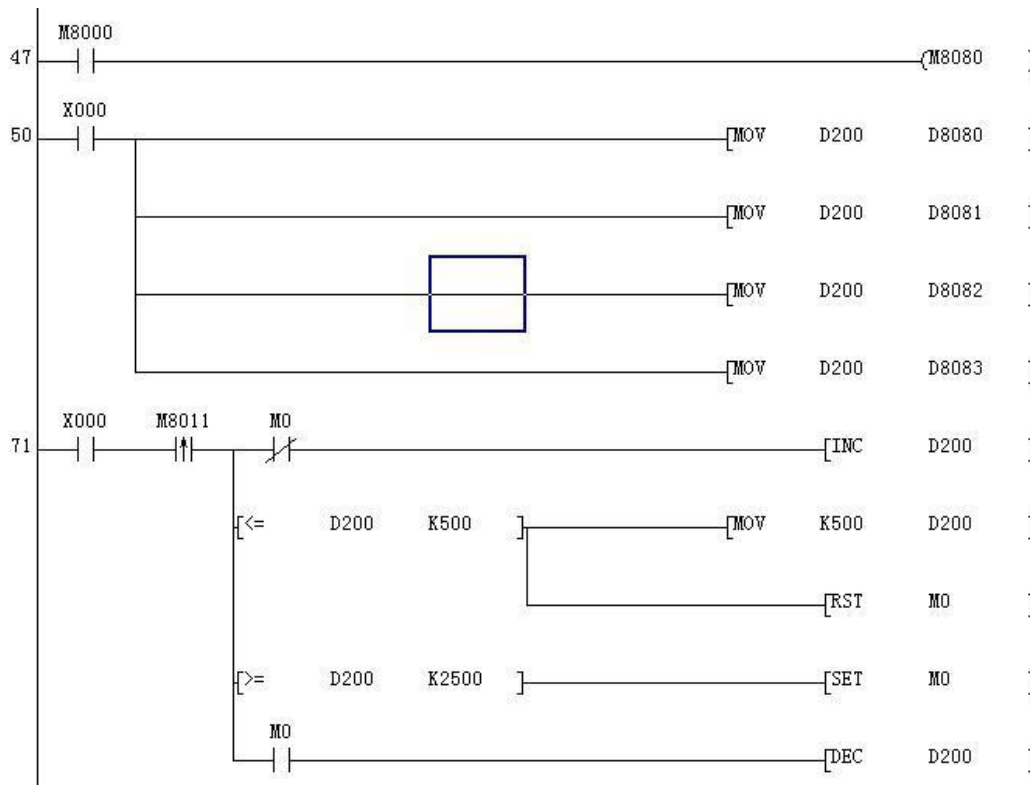
1. M8080 is the starting contact of analog DA0-DA3 output function, set to ON
In order to make the analog DA0-DA3 have an output.
2. M8084 is the start contact of the analog DA4-DA7 output function, set to ON.
When the analog DA4-DA7 has an output