6 PULSE OUTPUT

In this chapter we tell the pulse function of XC series PLC. The content includes pulse output instructions, input/output wiring, items to note and relate coils and registers etc.

6-1. Functions Summary

6-2. Pulse Output Types and Instructions

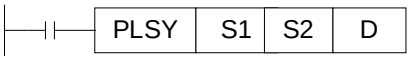
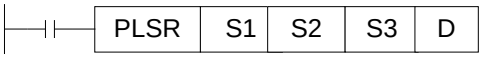
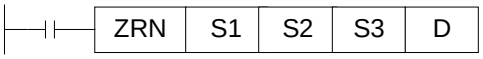
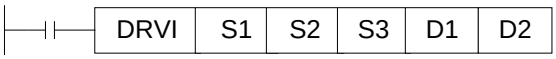
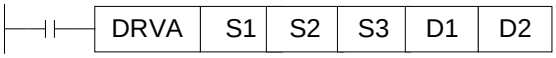
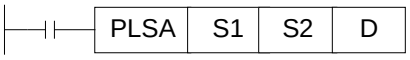
6-3. Output Wiring

6-4. Items To Note

6-5. Sample Programs

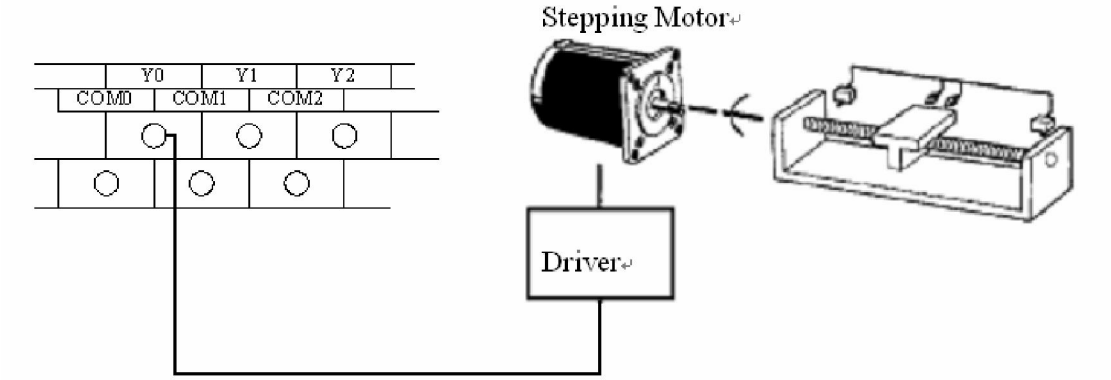
6-6. Coils and Registers Relate To Pulse Output

Pulse Output Instructions List

Mnemonic	Function	Circuit And Soft Device	Chapter
PULSE OUTPUT			
PLSY	Unidirectional ration pulse output without ACC/DEC time change		6-2-1
PLSF	Variable frequency pulse output		6-2-2
PLSR	Ration pulse output with ACC/DEC speed		6-2-3
PLSNEXT/ PLSNT	Pulse Section Switch		6-2-4
STOP	Pulse Stop		6-2-5
PLSMV	Refresh Pulse Nr. immediately		6-2-6
ZRN	Original Return		6-2-7
DRVI	Relative Position Control		6-2-8
DRVA	Absolute Position Control		6-2-9
PLSA	Absolute Position multi-section pulse control		6-2-10

6-1. Functions Summary

Generally, XC3 and XC5 series PLC are equipped with 2CH pulse output function. Via different instructions, users can realize unidirectional pulse output without ACC/DEC speed; unidirectional pulse output with ACC/DEC speed; multi-segments, positive/negative output etc., the output frequency can reach 400K Hz.



※1: To use pulse output, please choose PLC with transistor output, like XC3-14T-E or XC3-60RT-E etc.

※2: XC5 series 32I/O PLC has 4CH (Y0、Y1、Y2、Y3) pulse output function.

6-2．Pulse Output Types and Instructions

6-2-1．Unidirectional ration pulse output without ACC/DEC time change [PLSY]

1、Instruction Summary

Instruction to generate ration pulse with the specified frequency;

Unidirectional ration pulse output without ACC/DEC time change [PLSY]			
16 bits instruction	PLSY	32 bits instruction	DPLSY
Execution condition	Normally ON/OFF coil	Suitable models	XC2、XC3、XC5、XCM
Hardwarere quirement	-	Software requirements	-

2、Operands

Operands	Function	Type
S1	Specify the frequency's value or register ID	16 bits/32 bits, BIN
S2	Specify the pulse number or register's ID	16 bits /32 bits, BIN
D	Specify the pulse output port	bit

3、Suitable soft components

Word

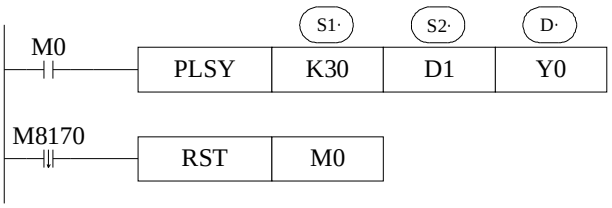
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●					●		
S2	●	●		●	●					●		

Bit

operands	system						
	X	Y	M	S	T	C	Dn.m
D		●					

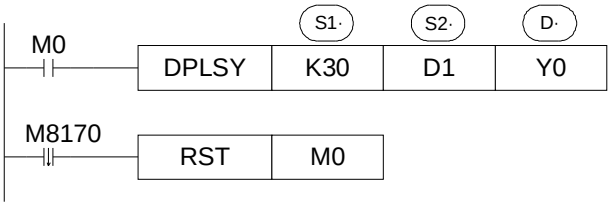
Functions And Actions

《16 bits instruction》



- Frequency Range: 0~400KHz；
- Pulse Quantity Range: 0~K32767；
- Pulse output from Y000 or Y001 only;
- When M0 is ON, PLSY instruction output 30Hz pulse at Y0, the pulse number is decided by D1, M8170 is set ON only when sending the pulse. When the output pulse number reaches the set value, stop sending the pulse, M8170 is set to be OFF, reset M0;

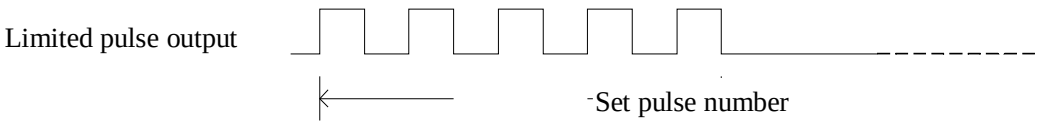
《32 bits instruction》



- Frequency Range: 0~400KHz；
- Pulse Quantity Range: 0~K2147483647；
- Pulse output from Y000 or Y001 only;
- When M0 is ON, DPLSY instruction output 30Hz pulse at Y0, the pulse number is decided by D2D1, M8170 is set ON only when sending the pulse. When the output pulse number reaches the set value, stop sending the pulse, M8170 is set to be OFF, reset M0;

Output Mode

《continuous or limited pulse number》



When finish sending the set pulse number, stop outputting automatically

Items to Note

If the control object is stepping/servo motor, we recommend users not use this instruction, to avoid the motor losing synchronism. PLSR is available.

6-2-2．Variable Pulse Output [PLSF]

1、Instruction Summary

Instruction to generate continuous pulse in the form of variable frequency

Variable Pulse Output [PLSF]			
16 bits Instruction	PLSF	32 bits Instruction	DPLSF
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S	Specify the frequency or register ID	16 bits/32 bits, BIN
D	Specify pulse output port	bit

3、suitable soft components

Word

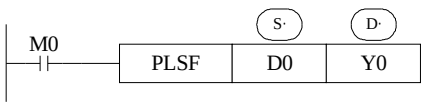
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S	●	●		●	●					●		

Bit

operands	system						
	X	Y	M	S	T	C	Dn.m
D		●					

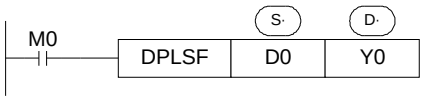
Functions And Actions

《16 bit instruction form》



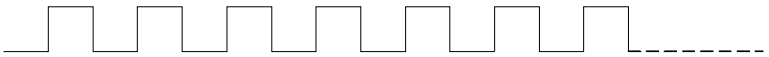
- Frequency range: 6Hz~400KHz (when the set frequency is lower than 200Hz, output 200Hz)
- Pulse can only be output at Y000 or Y001.
- With the changing of setting frequency in D0, the output pulse frequency changes at Y0
- Accumulate pulse number in register D8170 (DWord)

《32 bit instruction form》



- Frequency range: 6Hz~400KHz (when the set frequency is lower than 200Hz, output 200Hz)
- Pulse can only be output at Y000 or Y001.
- With the changing of setting frequency in D0, the output pulse frequency changes at Y0
- Accumulate pulse number in register D8170 (DWord)

Output Mode

Sequential pulse output 

Sequential output pulse with the set frequency till stop outputvia the instruction

6-2-3．Multi-segment pulse control at relative position [PLSR]

PLSR/DPLSR instruction has two control modes. Below we will instroduce one by one;

Ø Mode 1: segment uni-directional pulse output PLSR

1、Instruction Summary

Generate certain pulse quantity (segmented) with the specified frequency and acceleration/deceleration time

Segmented uni-directional pulse output [PLSR]			
16 bits Instruction	PLSR	32 bits Instruction	DPLSR
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the soft component's start ID of the segmented pulse parameters	16 bit/ 32 bit, BIN
S2	Specify acceleration/deceleration time or soft component's ID	16 bit/ 32 bit, BIN
D	Specify the pulse output port	Bit

3、suitable soft components

Word

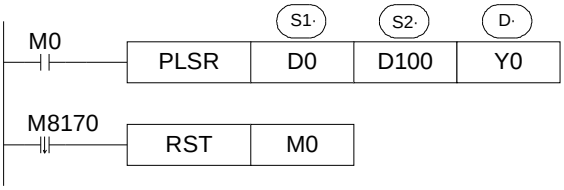
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●							
S2	●	●		●	●					●		

Bit

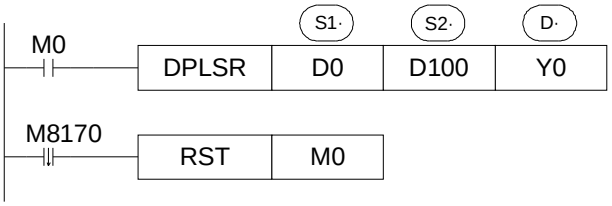
operands	system						
	X	Y	M	S	T	C	Dn.m
D		●					

Functions And A

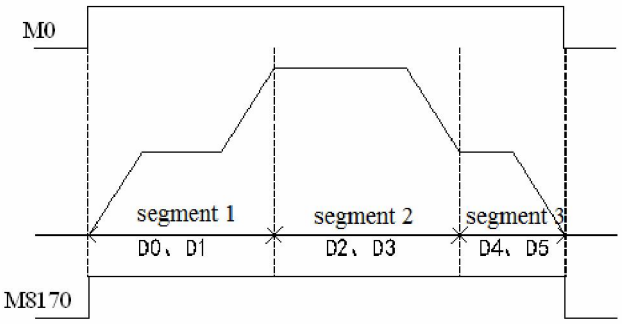
《16 bit instruction form》



《32 bit instruction form》



- The parameters' address is a section starts from **Dn** or **FDn**. In the above example (16bit instruction form): **D0** set the first segment pulse's highest frequency、**D1** set the first segment's pulse number，**D2** set the second segment pulse's highest frequency、**D3** set the second segment's pulse number，…… if the set value in **Dn**、**Dn+1** is 0, this represents the end of segment, the segment number is not limited.
- To 32 bit instruction **DPLSR**, **D0**、**D1** set the first segment pulse's highest frequency、**D2**、**D3** set the first segment's pulse number, **D4**、**D5** set the second segment pulse's highest frequency、**D6**、**D7** set the second segment's pulse number……
- Acceleration/deceleration time is the time from the start to the first segment's highest frequency. Meantime, it defines the slope of all segment's frequency to time. In this way the following acceleration/deceleration will perform according to this slope.
- Pulse can be output at only Y000 or Y001
- Frequency range: 0~400KHz;
- Pulse number range: 0~K32,767 (16 bits instruction)、0~K2,147,483,647 (32 bits instruction)
- Acceleration/deceleration time : below 65535 ms



Ø Mode 2: segmented dual-directional pulse output PLSR

1、Instruction Summary

Generate certain pulse quantity with the specified frequency、acceleration/deceleration time and pulse direction ;

Segmented dual-directional pulse output [PLSR]			
16 bits Instruction	PLSR	32 bits Instruction	DPLSR
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the soft component's start ID of the segmented pulse parameters	16 bit/ 32 bit, BIN
S2	Specify acceleration/deceleration time or soft component's ID	16 bit/ 32 bit, BIN
D1	Specify the pulse output port	Bit
D2	Specify the pulse output direction's port	Bit

3、suitable soft components

Word

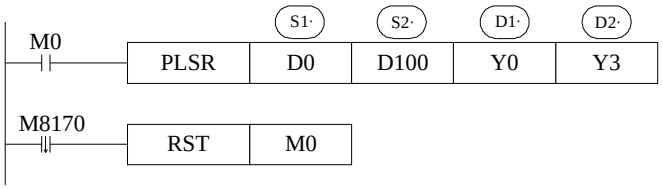
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●							
S2	●	●		●	●					K		

Bit

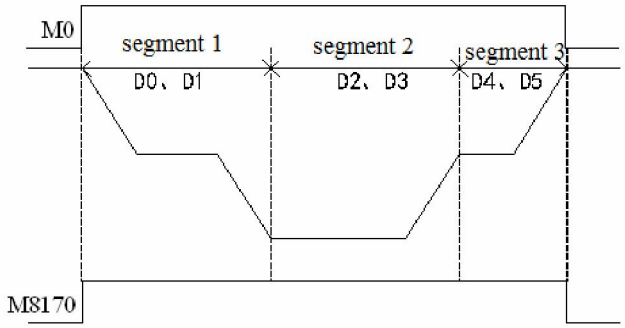
operands	system						
	X	Y	M	S	T	C	Dn.m
D1		●					
D2		●					

Functions And Actions

《16 bit instruction form》



- The parameters' address is a section starts from **Dn** or **FDn**. In the above example: **D0** set the first segment pulse's highest frequency、**D1** set the first segment's pulse number，**D2** set the second segment pulse's highest frequency、**D3** set the second segment's pulse number，…… if the set value in **Dn**、**Dn+1** is 0, this represents the end of segment, the segment number is not limited.
- Acceleration/deceleration time is the time from the start to the first segment's highest frequency. Meantime, it defines the slope of all segment's frequency to time. In this way the following acceleration/deceleration will perform according to this slope.
- Pulse can be output at only Y000 or Y001
- Y for Pulse direction can be specified freely. E.g.: if in S1 (the first segment) the pulse number is positive, Y output is ON; if the pulse number is negative, Y output is OFF; Note: in the first segment's pulse output, the pulse direction is only decided by the pulse number's nature (positive or negative) of the first segment.
- Frequency range: 0~400KHz;
- Pulse number range: 0~K32,767 (16 bits instruction)、0~K2,147,483,647 (32 bits instruction)
- Acceleration/deceleration time : below 65535 ms



6-2-4．Pulse Segment Switch [PLSNEXT]/[PLSNT]

1、Instruction Summary

Enter the next pulse output;

Pulse segment switch [PLSNEXT]/[PLSNT]			
16 bits Instruction	PLSNEXT/PLSNT	32 bits Instruction	-

Execution condition	Rising/falling edge	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
D	Specify the pulse output port	Bit

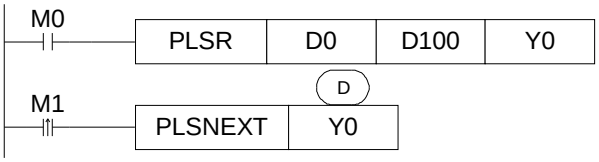
3、suitable soft components

Bit

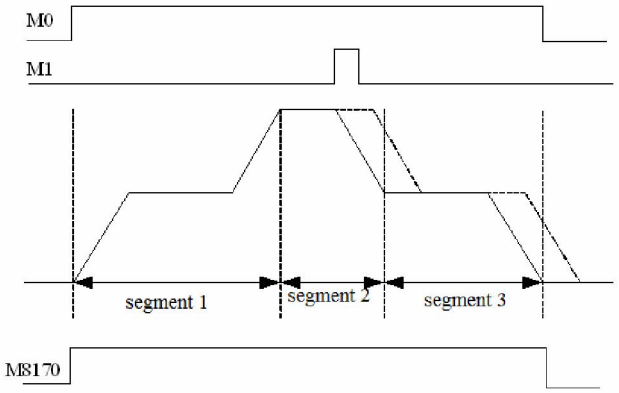
operands	system						
	X	Y	M	S	T	C	Dn.m
D		●					

Functions And Actions

《16 bit instruction form》



- If the pulse output reaches the highest frequency at the current segment, and output steadily at this frequency; when M1 changes from OFF to ON, then enter the next pulse output with the acceleration/deceleration time;
- Run the instruction within the acceleration/deceleration time is invalid;



--------(the dashed line represents the original pulse output

6-2-5．Pulse Stop [STOP]

1、Instruction Summary

Stop pulse output immediately;

Pulse stop [STOP]			
16 bits Instruction	STOP	32 bits Instruction	-
Execution condition	Rising/falling edge	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
D	Specify the port to stop pulse output	Bit

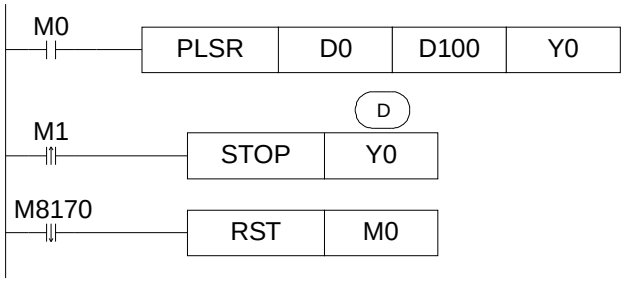
3、suitable soft components

Bit

operands	system						
	X	Y	M	S	T	C	Dn.m
D		•					

Functions And Actions

《16 bit instruction form》



l When M000 changes from OFF to be ON, PLSR output pulse at Y000. D0 specify the frequency, D001 specify the pulse number, D100 specify the acceleration/deceleration time; when the output pulse number reaches the set value, stop outputting the pulse; on the rising edge of M001, STOP instruction stops outputting the pulse at Y000;

6-2-6. Refresh the pulse number at the port [PLSMV]

1、Instruction Summary

Refresh the pulse number at the port;

Refresh the pulse number at the port [PLSMV]			
16 bits Instruction	-	32 bits Instruction	PLSMV
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S	Specify the pulse number or soft components' ID	32bit, BIN
D	Specify the port to refresh the pulse	Bit

3、suitable soft components

Word

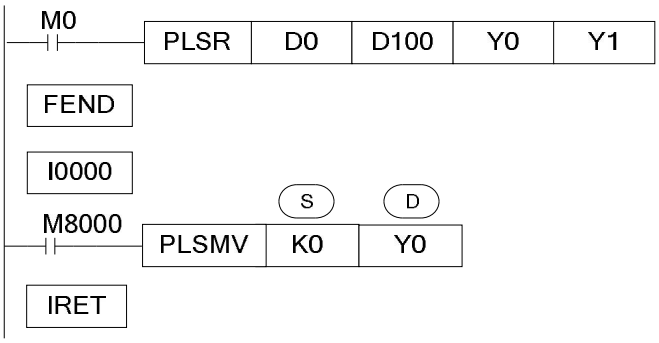
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S	●	●		●	●					●		

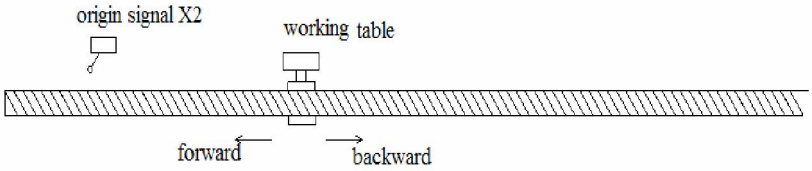
Bit

operands	system						
	X	Y	M	S	T	C	Dnm
D		●					

Functions And Actions

《32 bit instruction form》





- When the working table is moving backward, it gets the origin signal X2, execute the external interruption, PLSMV command run immediately, not effected by the scan cycle. Refresh the pulse number from Y0 and send to D8170;
- This instruction is used remove the accumulation difference caused in pulse control;

6-2-7. Back to the Origin [ZRN]

1、Instruction Summary

Back to the Origin

Back to the Origin [ZRN]			
16 bits Instruction	ZRN	32 bits Instruction	DZRN
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the backward speed or soft components' ID	16/32bit, BIN
S2	Specify the creeping speed or soft components' ID	16/32 bit, BIN
S3	Specify the soft components' ID of the close point's signal	Bit
D	Specify the pulse output port	Bit

3、suitable soft components

Word

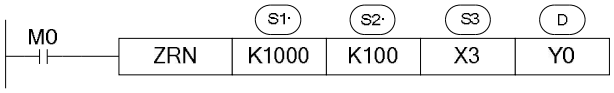
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●					●		
S2	●	●		●	●					●		

Bit

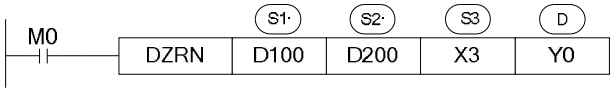
operands	system						
	X	Y	M	S	T	C	Dn.m
S3	●		●				
D		●					

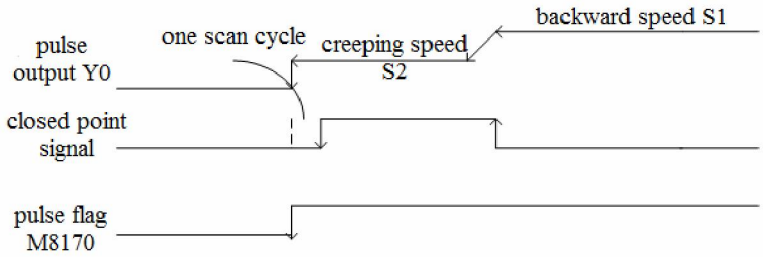
Functions And Actions

《16 bit instruction form》



《32 bit instruction form》





- Pulse output address: Y0 or Y1 only;
- S1 and S2 direction is same and the absolute value of S1 is greater than S2;
- After driving the instruction, move with the origin return speed S1;
- When the closed point signal turns from OFF to be ON, decrease the speed to be S2;
- When the closed point signal turns from ON to be OFF, write to registers (Y0:[D8171,D8170],Y1:[D8174,D8173]) when stopping pulse output;
- The decrease time can be specified by D8230~D8239; please refer to chapter 6-6 for details;

6-2-8. Relative position uni-segment pulse control [DRVI]

1、Instruction Summary

Relative position uni-segment pulse control;

Relative position uni-segment pulse control [DRVI]			
16 bits Instruction	DRVI	32 bits Instruction	DDRVI
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the output pulse value or soft components ID	16/32bit, BIN
S2	Specify the output pulse frequency or soft components ID	16/32 bit, BIN
D1	Specify the pulse output port	Bit
D2	Specify the pulse output direction port	Bit

3、suitable soft components

Word

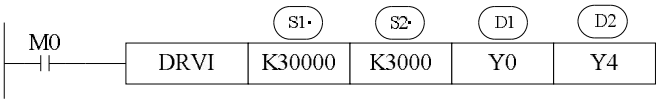
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●					●		
S2	●	●		●	●					●		

Bit

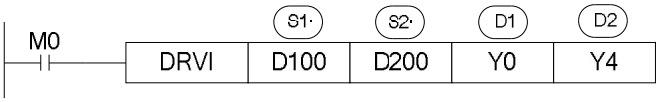
operands	system						
	X	Y	M	S	T	C	Dn.m
D1		●					
D2		●					

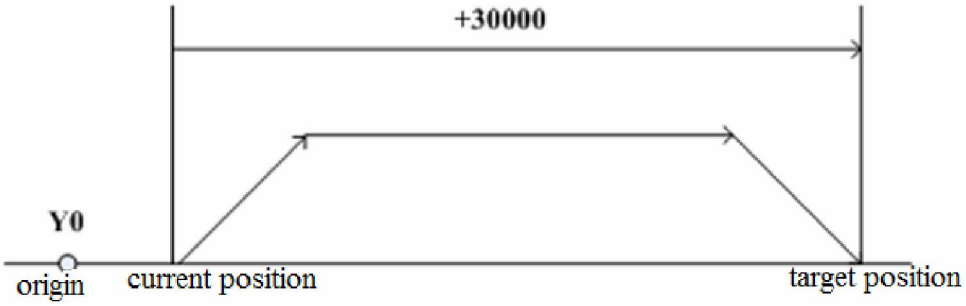
Functions And Actions

《16 bit instruction form》



《32 bit instruction form》





- Pulse output ID: only Y0 or Y1;
- Pulse output direction can specify any Y;
- Acceleration/deceleration time is specified by D8230 (single word)
- The relative drive form means: move from the current position;

6-2-9. Absolute position uni-segment pulse control [DRVA]

1、Instruction Summary

Absolute position uni-segment pulse control

Absolute position uni-segment pulse control [DRVA]			
16 bits Instruction	DRVA	32 bits Instruction	DDRVA
Execution	Normally ON/OFF coil	Suitable	XC2、XC3、XC5、XCM

condition		Models	
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the output pulse value or soft components ID	16/32bit, BIN
S2	Specify the output pulse frequency or soft components ID	16/32 bit, BIN
D1	Specify the pulse output port	Bit
D2	Specify the pulse output direction port	Bit

3、suitable soft components

Word

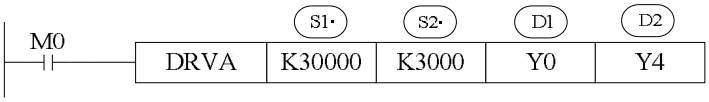
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●					●		
S2	●	●		●	●					●		

Bit

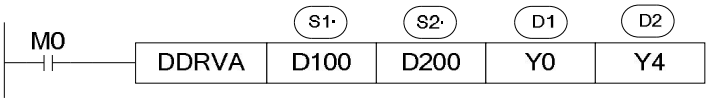
operands	system						
	X	Y	M	S	T	C	Dnm
D1		●					
D2		●					

Functions And Actions

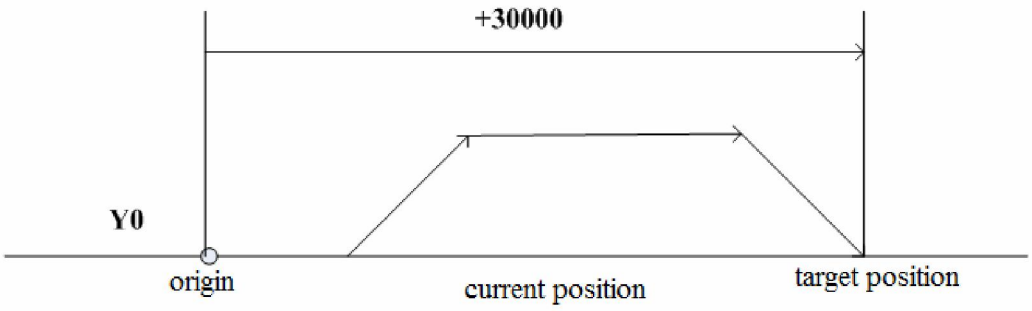
《16 bit instruction form》



《32 bit instruction form》



(Y0:[D8171,D8170],Y1:[D8174,D8173])



- Pulse output ID: only Y0 or Y1;
- Pulse output direction can specify any Y;
- Acceleration/deceleration time is specified by D8230 (single word)
- The relative drive form means: move from the origin position;
- Target position means S1, correspond with the following current value register as the absolute position

6-2-10. Absolute position multi-segment pulse control [PLSA]

PLSA/DPLSA has two control modes, below we will introduce one by one;

Ø Mode 1: uni-directional pulse output PLSA

1、Instruction Summary

Generate absolute position segmented pulse with the specified frequency, acceleration/deceleration time and pulse direction;

Absolute position multi-segment pulse control [PLSA]			
16 bits Instruction	PLSA	32 bits Instruction	DPLSA
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the soft component's number to output the pulse parameters	16/32bit, BIN
S2	Specify the acceleration/deceleration time or soft component's number	16/32 bit, BIN
D	Specify the pulse output port	Bit

3、suitable soft components

Word

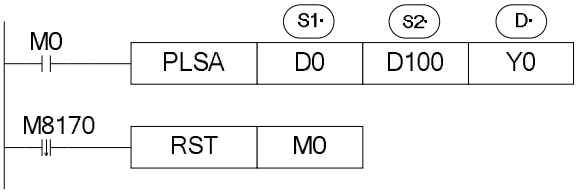
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●							
S2	●	●		●	●					K		

Bit

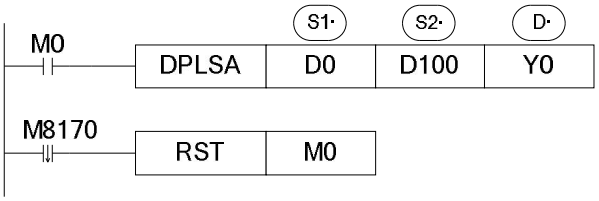
operands	system						
	X	Y	M	S	T	C	Dn.m
D1		●					

Functions And Actions

《16 bit instruction form》



《32 bit instruction form》



- The parameters' address is a section starts from **Dn** or **FDn**. In the above example: **D0** set the first segment pulse's highest frequency、**D1** set the first segment's absolute position，**D2** set the second segment pulse's highest frequency、**D3** set the second segment's absolute position，…… if the set value in **Dn**、**Dn+1** is 0, this represents the end of segment, we can set 24 segments in total;
- Acceleration/deceleration time is the time from the start to the first segment's highest frequency. Meantime, it defines the slope of all segment's frequency to time. In this way the following acceleration/deceleration will perform according to this slope.
- Pulse can be output at only Y000 or Y001

Ø Mode2: dual-directional pulse output PLSA

1、Instruction Summary

Generate absolute position pulse with the specified frequency, acceleration/deceleration time and pulse direction;

Absolute position multi-segment pulse control [PLSA]			
16 bits Instruction	PLSA	32 bits Instruction	DPLSA
Execution condition	Normally ON/OFF coil	Suitable Models	XC2、XC3、XC5、XCM
Hardware requirement	-	Software requirement	-

2、Operands

Operands	Function	Type
S1	Specify the soft component's number to output the pulse parameters	16/32bit, BIN
S2	Specify the acceleration/deceleration time or soft component's number	16/32 bit, BIN
D1	Specify the pulse output port	Bit
D2	Specify the pulse direction port	Bit

3、suitable soft components

Word

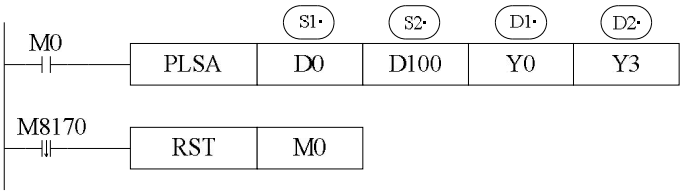
operands	system									constant	module	
	D	FD	ED	TD	CD	DX	DY	DM	DS	K/H	ID	QD
S1	●	●		●	●							
S2	●	●		●	●					K		

Bit

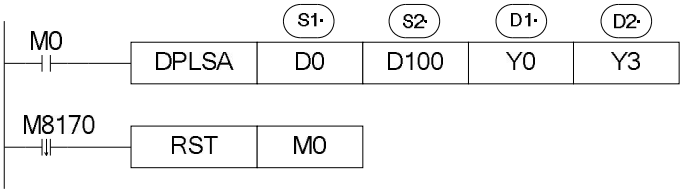
operands	system						
	X	Y	M	S	T	C	Dnm
D1		●					
D2		●					

Functions And Actions

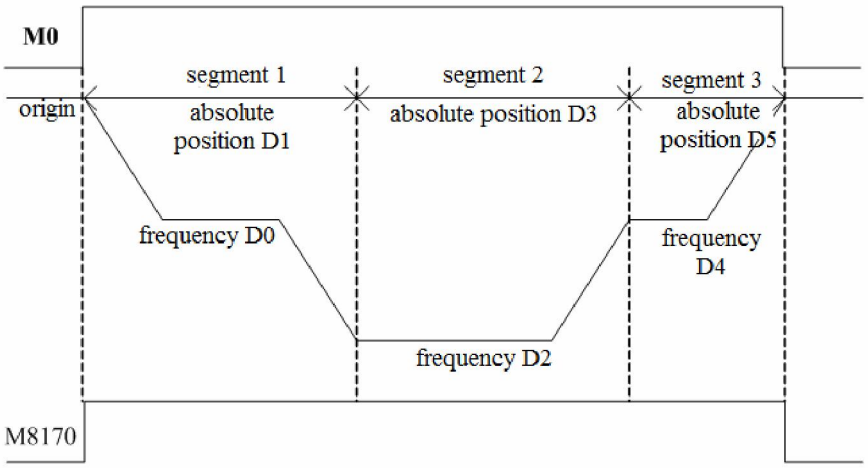
《16 bit instruction form》



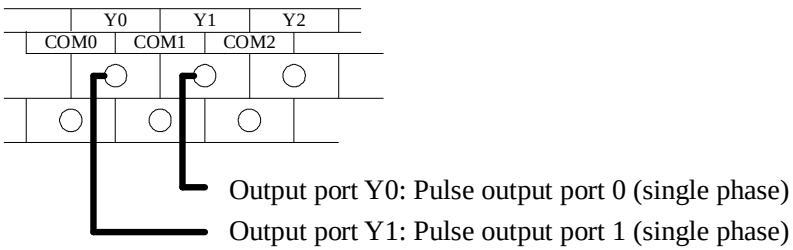
《32 bit instruction form》



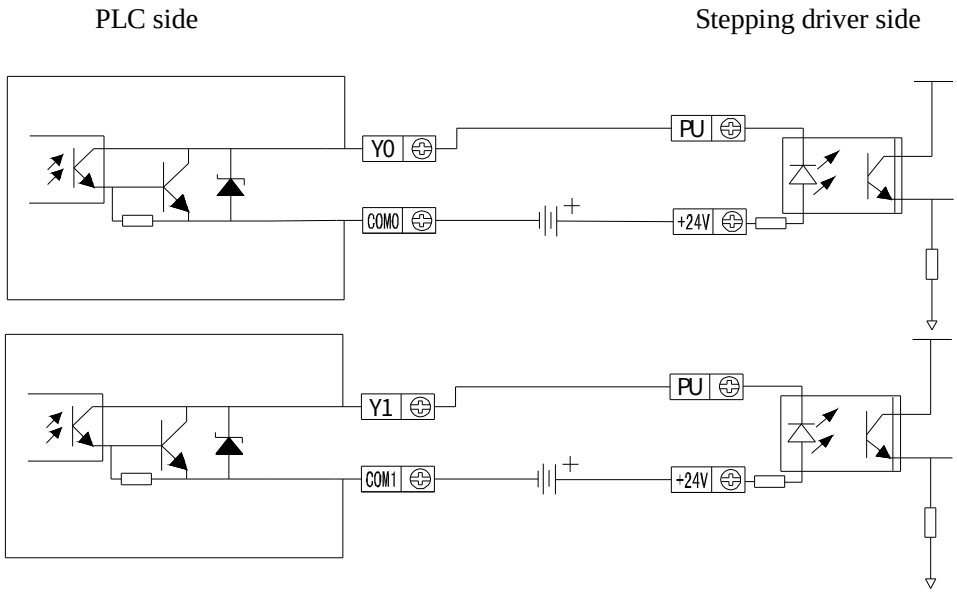
- The parameters' address is a section starts from **Dn** or **FDn**. In the above example: **D0** set the first segment pulse's highest frequency、**D1** set the first segment's absolute position，**D2** set the second segment pulse's highest frequency、**D3** set the second segment's absolute position，…… if the set value in **Dn**、**Dn+1** is 0, this represents the end of segment, we can set 24 segments in total;
- Acceleration/deceleration time is the time from the start to the first segment's highest frequency. Meantime, it defines the slope of all segment's frequency to time. In this way the following acceleration/deceleration will perform according to this slope.
- Pulse can be output at only Y000 or Y001
- The Y port to output the pulse direction can be set freely;



6-3．Output Wiring

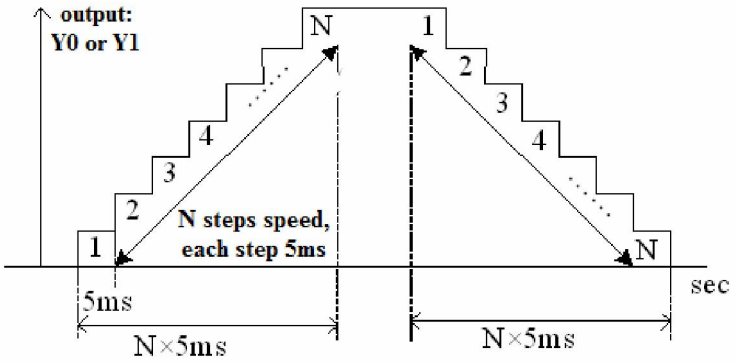


Below is the graph to show the output terminals and stepping driver wiring:



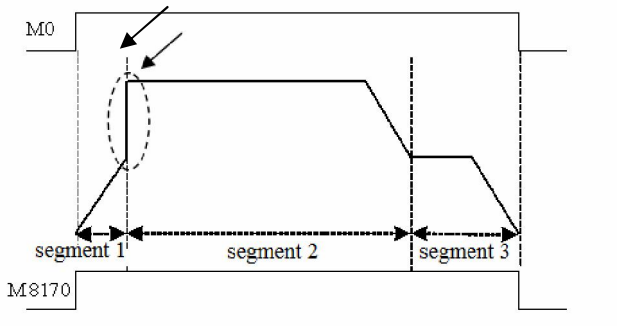
6-4. Items to Note

1、Concept of Step Frequency



- During ACC/DEC, each step time is 5ms, this time is fixed and not changeable.
- The minimum step frequency (each step's rising/falling time) is 10Hz. If the frequency is lower than 10Hz, calculate as 10Hz; the maximum step frequency is 15Hz. If the frequency is larger than 15Hz, calculate as 15Hz;
- In case of frequency larger than 200Hz, please make sure each segment's pulse number no less than 10, if the set value is less than 10, send as 200Hz;

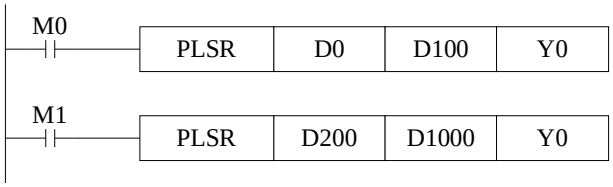
2、frequency jump in segment pulse output



- When outputting the segmented pulse, if the current segment's pulse has been set out, while meantime it doesn't reach the highest frequency, then from the current segment to the next pulse output segment, pulse jump appears, see graph above;

3、dual pulse output is invalid

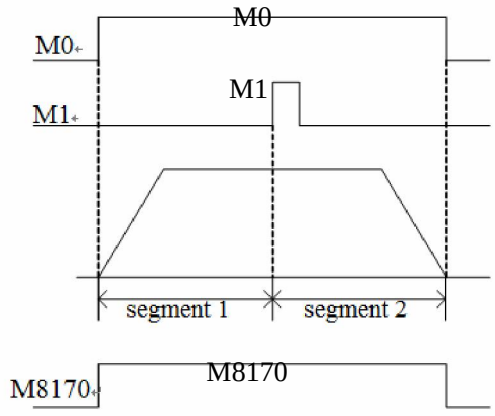
- In one main program, users can't write two or more pulse output instructions with one output port Y;
- The below sample is wrong;



6-5. Sample Programs

E.g.1: Stop at certain length

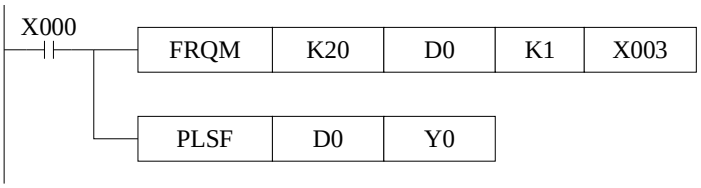
With instruction [PLSR] and [PLSNEXT], realize this "stop at certain length" function;



Take the sample program as the example, set two segments pulse output in D0、D1 and D2，D3, with the same frequency value; In second segment pulse output, set pulse number D3 as the output pulse number after receive M1 signal. This will realize "stop at certain length" function. See graph by the left side;

E.g.2: follow function

In this sample, the pulse frequency from Y0 equals with the frequency tested from X003. If the frequency tested from X003 changes, the pulse frequency from Y0 changes;



6-6. Relative coils and registers of pulse output

Some flags of pulse output are listed below:

ID	Pulse ID	Function	specification
M8170	PULSE_1	“sending pulse” flag	Being ON when sending the pulse,
M8171		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8172		Direction flag	1 is positive direction, the correspond direction port is on
M8173	PULSE_2	“sending pulse” flag	Being ON when sending the pulse,
M8174		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8175		Direction flag	1 is positive direction, the correspond direction port is on
M8176	PULSE_3	“sending pulse” flag	Being ON when sending the pulse,
M8177		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8178		Direction flag	1 is positive direction, the correspond

			direction port is on
M8179	PULSE_4	“sending pulse” flag	Being ON when sending the pulse,
M8180		overflow flag of “32 bits pulse sending”	When overflow, Flag is on
M8181		Direction flag	1 is positive direction, the correspond direction port is on
M8210	PULSE_1	Pulse alarm flag (frequency change suddenly)	**1** is alarm, **0** is correct
M8211		Neglect the alarm or not	When flag is 1, stop sending alarm
M8212	PULSE_2	Pulse alarm flag (frequency change suddenly)	**1** is alarm, **0** is correct
M8213		Neglect the alarm or not	When flag is 1, stop sending alarm
M8214	PULSE_3	Pulse alarm flag (frequency change suddenly)	**1** is alarm, **0** is correct
M8215		Neglect the alarm or not	When flag is 1, stop sending alarm
M8216	PULSE_4	Pulse alarm flag (frequency change suddenly)	**1** is alarm, **0** is correct
M8217		Neglect the alarm or not	When flag is 1, stop sending alarm
M8218	PULSE_5	Pulse alarm flag (frequency change suddenly)	**1** is alarm, **0** is correct
M8219		Neglect the alarm or not	When flag is 1, stop sending alarm

Some special registers of pulse output are listed below:

ID	Pulse ID	Function	Specification
D8170	PULSE_1	The low 16 bits of accumulated pulse number	
D8171		The high 16 bits of accumulated pulse number	
D8172		The current segment (means Nr.n segment)	
D8173	PULSE_2	The low 16 bits of accumulated pulse number	
D8174		The high 16 bits of accumulated pulse number	
D8175		The current segment (means Nr.n segment)	
D8176	PULSE_3	The low 16 bits of accumulated pulse number	
D8177		The high 16 bits of accumulated pulse number	
D8178		The current segment (means Nr.n segment)	
D8179	PULSE_4	The low 16 bits of accumulated pulse number	
D8180		The high 16 bits of accumulated pulse	

		number	
D8181		The current segment (means Nr.n segment)	
D8190	PULSE_1	The low 16 bits of the current accumulated current pulse number	
D8191		The high 16 bits of the current accumulated current pulse number	
D8192	PULSE_2	The low 16 bits of the current accumulated current pulse number	
D8193		The high 16 bits of the current accumulated current pulse number	
D8194	PULSE_3	The low 16 bits of the current accumulated current pulse number	Only XC5-32RT-E (4PLS) model has
D8195		The high 16 bits of the current accumulated current pulse number	
D8196	PULSE_4	The low 16 bits of the current accumulated current pulse number	
D8197		The high 16 bits of the current accumulated current pulse number	
D8210	PULSE_1	The error pulse segment's position	
D8212	PULSE_2	The error pulse segment's position	
D8214	PULSE_3	The error pulse segment's position	
D8216	PULSE_4	The error pulse segment's position	
D8218	PULSE_5	The error pulse segment's position	

Absolute position/relative position/back to origin;

ID	Pulse	Function	Description
D8230	PULSE_1	Rising time of the absolute/relation position instruction (Y0)	
D8231		Falling time of the origin return instruction (Y0)	
D8232	PULSE_2	Rising time of the absolute/relation position instruction (Y1)	
D8233		Falling time of the origin return instruction (Y1)	
D8234	PULSE_3	Rising time of the absolute/relation position instruction (Y2)	
D8235		Falling time of the origin return instruction (Y2)	
D8236	PULSE_4	Rising time of the absolute/relation position instruction (Y3)	
D8237		Falling time of the origin return instruction (Y3)	

D8238	PULSE_5	Rising time of the absolute/relation position instruction	
D8239		Falling time of the origin return instruction	