



- FUN140 instruction supports the new command DRVZ for machine zero return; it can have 3 operation modes for application's choice.
- FUN141 instruction supports the new motion parameter's settings to work with the machine zero return operation
  - . Parameter 6 : Creep speed for machine zero return
  - . Parameter 9-1 : Zero return direction
  - . Parameter 13 : Linear interpolation time constant
  - . Parameter 15-0 : DOG input
  - . Parameter 15-1 : Stroke limit input
  - . Parameter 15-2 : PG0 (Zero point signal) input
  - . Parameter 15-3 : Clear output
  - . Parameter 16 : Machine zero point address
  - . Parameter 17 : Number of zero point signals
- Enhance the password protection
  - . The PLC main unit verifies the password while being on line connected with the WinProladder software if the ladder program existing the password protection; only passing the correct password, it can allow to have the connection for programming tool.
- It needs WinProladder software V2.34 or later version to support above functions
- Remove the bug - while M1913=1 (Turn off outputs), it had incorrect input status reading from expansion I/O module(s).
- Only passing correct password to allow the ROM PACK operation if the ladder program existing the password protection

## .Description of machine zero return command (DRVZ)

Please refer to Chapter 13 (The NC positioning control of FBs-PLC) of Manual II for detailed information about FUN140 instruction; here we only focus the subject on the new command DRVZ for machine zero return application.

The DRVZ command supports three modes of operation for different application requirement; conjoining the FUN141 motion parameter's setting of machine zero return related, it can be listed as below:

|                                   | DRVZ MD0 | DRVZ MD1 | DRVZ MD2 |
|-----------------------------------|----------|----------|----------|
| Parameter 6 (Creep speed)         | Must be  | Must be  | Must be  |
| Parameter 9-1 (Return direction)  | Must be  | Must be  | Must be  |
| Parameter 15-0 (DOG input)        | Must be  | Must be  | Must be  |
| Parameter 15-1 (Limit input)      | Optional | Optional | Optional |
| Parameter 15-2 (PG0 input)        | No need  | No need  | Must be  |
| Parameter 15-3 (CLR output)       | Optional | Optional | Optional |
| Parameter 16 (Zero point address) | Must be  | Must be  | Must be  |
| Parameter 17 (No. of PG0 signal)  | No need  | No need  | Must be  |

The FUN140 instruction can't be executed for machine zero return while encountering the following situations with the error indications:

| Error indication | Error code                         |
|------------------|------------------------------------|
| R4060 (Ps 0)     | 42 : DRVZ can't follow DRVC        |
| R4061 (Ps 1)     | 50 : Illegal operation mod of DRVZ |
| R4062 (Ps 2)     | 51 : Illegal DOG input             |
| R4063 (Ps 3)     | 52 : Illegal PG0 input             |
|                  | 53 : Illegal CLR output            |

### . Example program 1 for DRVZ

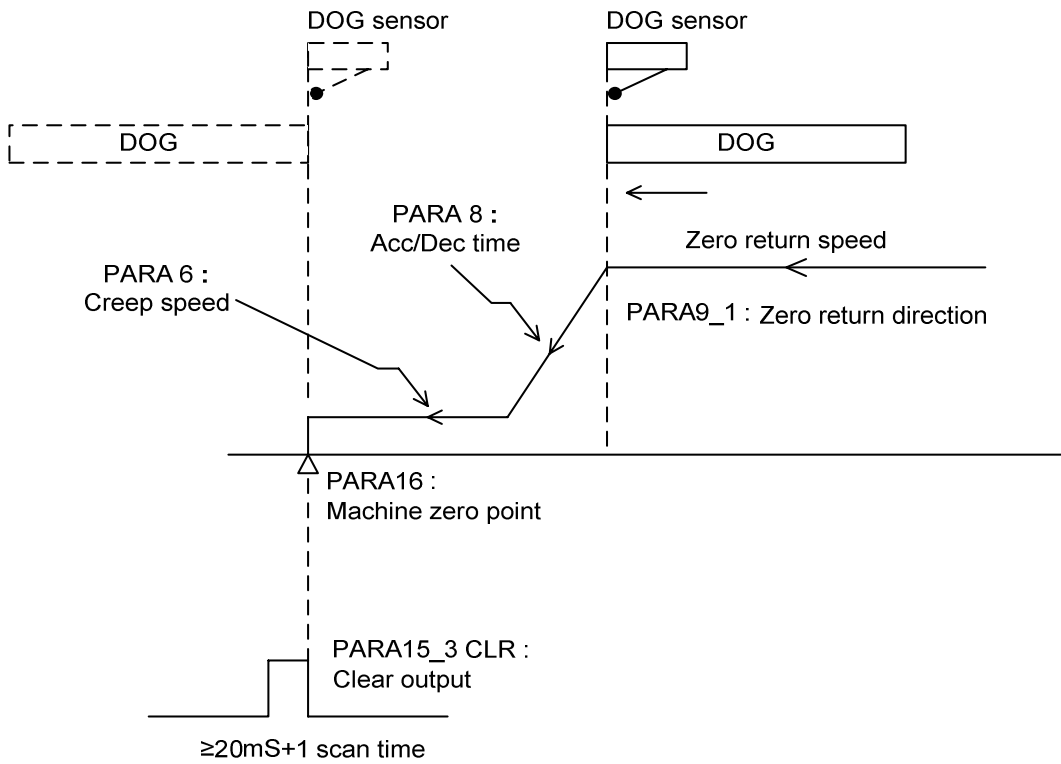
```
SPD   R1000
DRVZ  MD0
MEND
```

### . Example program 2 for DRVZ

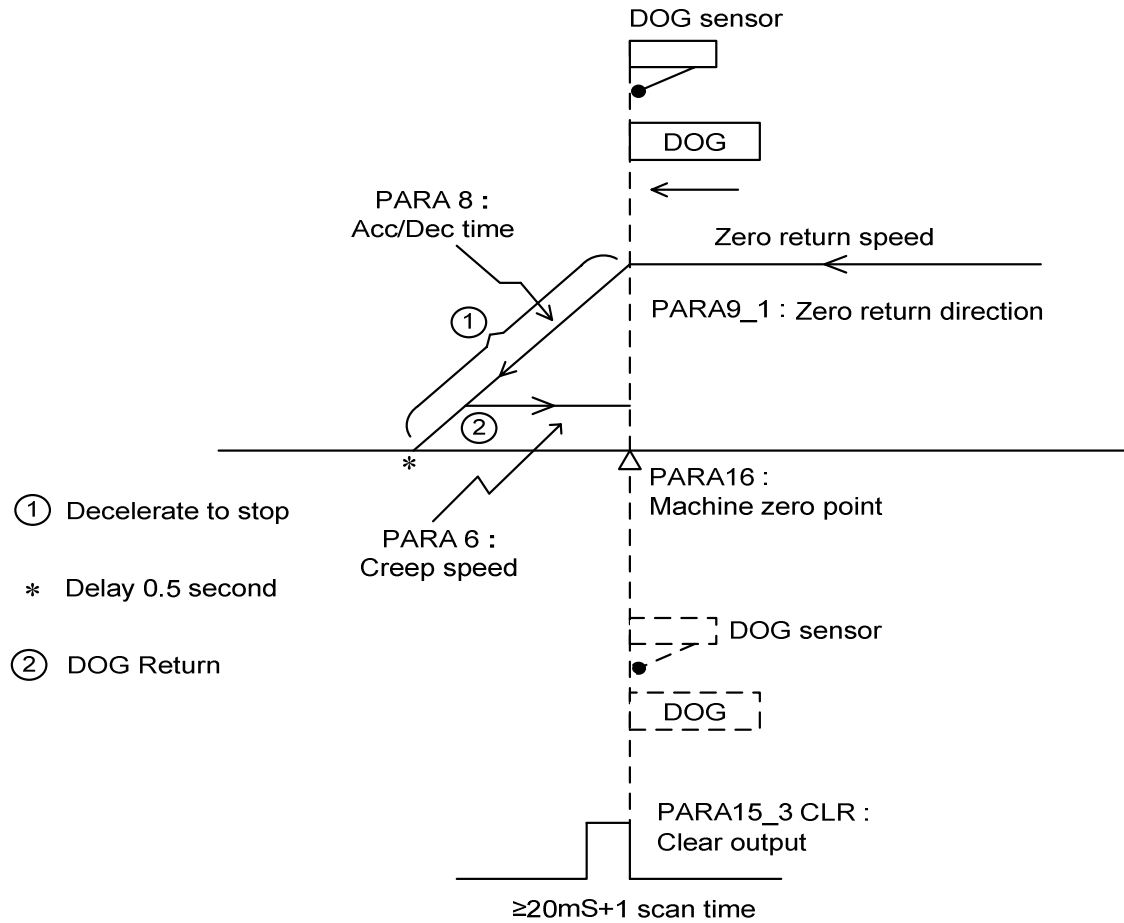
```
SPD   R1000
DRVZ  MD1
WAIT  M0 GOTO NEXT
```

## .Description in diagram for machine zero return operation

Mode 0



Mode 1

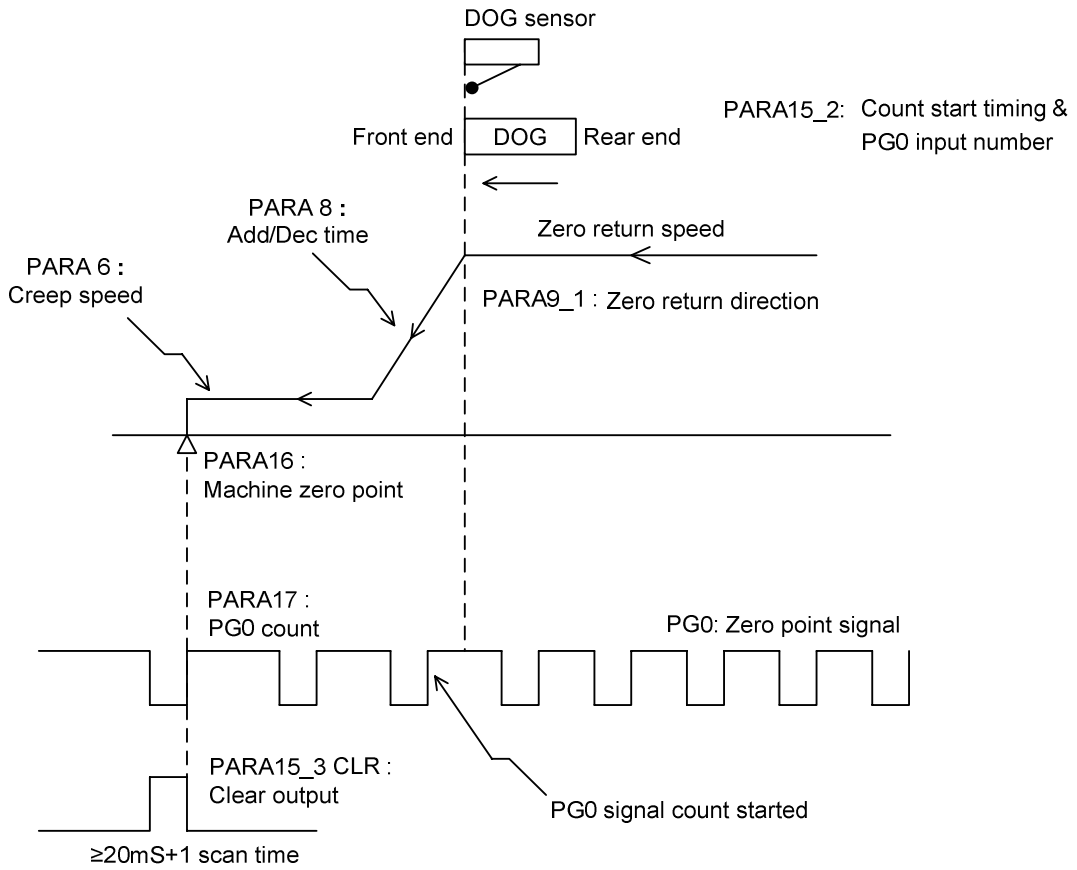


① Decelerate to stop

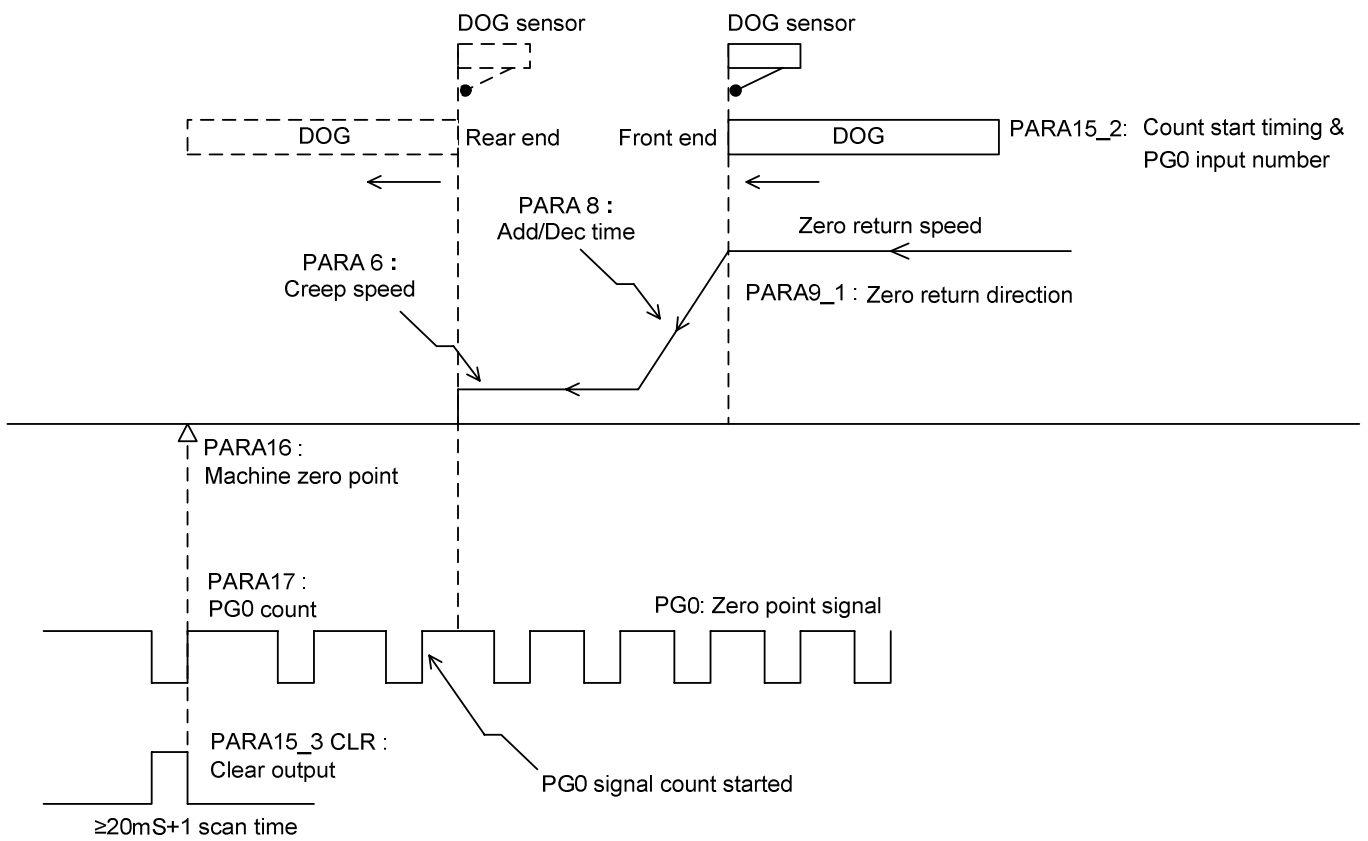
\* Delay 0.5 second

② DOG Return

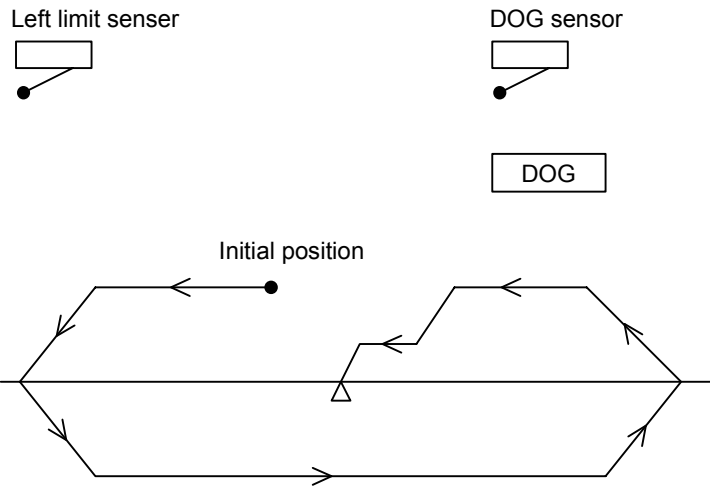
**Mode 2(Front end counter)**



**Mode 2(Rear end counter)**



When initial position behind the DOG sensor



## .Description of machine zero return related parameters

Please refer to Chapter 13 (The NC positioning control of FBs-PLC) of Manual II for detailed information about FUN141 instruction; here we only focus the subject on the new parameters working with command DRVZ for machine zero return application.

FUN141 Motion parameter table

|       |                        |              |                    |
|-------|------------------------|--------------|--------------------|
| SR+0  | 0~2                    | Parameter 0  | Default =1         |
| SR+1  | 1~65535 Ps/Rev         | Parameter 1  | Default =2000      |
| SR+2  | 1~999999 uM/Rev        | Parameter 2  | Default =2000      |
|       | 1~999999 mDeg/Rev      |              |                    |
|       | 1~999999×0.1 mInch/Rev |              |                    |
| SR+4  | 0~3                    | Parameter 3  | Default =2         |
| SR+5  | 1~921600 Ps/Sec        | Parameter 4  | Default =460000    |
|       | 1~153000               |              |                    |
| SR+7  | 1~921600 Ps/Sec        | Parameter 5  | Default =141       |
|       | 1~153000               |              |                    |
| SR+9  | 1~65535 Ps/Sec         | Parameter 6  | Default =1000      |
| SR+10 | 0~32767                | Parameter 7  | Default =0         |
| SR+11 | 0~30000                | Parameter 8  | Default =5000      |
| SR+12 | 0~1                    | Parameter 9  | Default =0100H     |
| SR+13 | -32768~32767           | Parameter 10 | Default =0         |
| SR+14 | -32768~32767           | Parameter 11 | Default =0         |
| SR+15 | 0~30000                | Parameter 12 | Default =0         |
| SR+16 | 0~30000                | Parameter 13 | Default =500       |
| SR+17 | 0~4294967295           | Parameter 14 | Default =0         |
| SR+19 | 00H~FFH                | Parameter 15 | Default =FFFFFFFFH |
| SR+20 | 00H~FFH                |              |                    |
| SR+21 | -999999~999999         | Parameter 16 | Default =0         |
| SR+23 | 0~255                  | Parameter 17 | Default =1         |

- Parameter 6 : Creep speed for machine zero return; the default is 1000  
Motor and compound unit : 1~65535 Ps/Sec  
Machine unit : 1~15300 (Cm/Min, ×10 Deg/Min, Inch/Min)
- Parameter 9 : Rotation and zero return direction; the default is 0100H

|       |          |       |          |
|-------|----------|-------|----------|
|       | b15      | b8 b7 | b0       |
| SR+12 | Para 9-1 |       | Para 9-0 |

- Parameter 9-0 : Rotation direction setting; the default is 0  
Setting value=0, the present value increases while in forward pulse output; the present value decreases while in backward pulse output  
Setting value=1, the present value decreases while in forward pulse output; the present value increases while in backward pulse output
- Parameter 9-1 : Zero return direction setting; the default is 1  
Setting value=0, direction in which the present value increases  
Setting value=1, direction in which the present value decreases

- Parameter 13 : Interpolation time constant; the default is 500  
.Setting range : 0~30000 mS  
.Set the time required to achieve the speed specified by the program. (The initiate speed is always regarded as "0".)  
This parameter is valid while interpolation control
- Parameter 15 : I/O control interface for DRVZ; the default is FFFFFFFFH

|       |           |       |           |
|-------|-----------|-------|-----------|
|       | b15       | b8 b7 | b0        |
| SR+19 | Para 15-1 |       | Para 15-0 |
| SR+20 | Para 15-3 |       | Para 15-2 |

- Parameter 15-0 : Setting of DOG input (SR+19)  
b6~b0 : Reference number of DOG input  
(0~15, it means X0~X15)  
b7 = 0 : Contact A or Normal Open  
= 1 : Contact B or Normal Close  
b7~b0=FFH, Without DOG input
- Parameter 15-1 : Setting of stroke limit input (SR+19)  
b14~b8 : Reference number of limit input  
(0~125, it means X0~X125)  
b15 = 0 : Contact A or Normal Open  
= 1 : Contact B or Normal Close  
b15~b8=FFH, Without limit input

- Parameter 15-2 : Setting of PG0 signal input (SR+20)
  - b6~b0 : Reference number of PG0 input  
( 0~15, it means X0~X15 )
  - b7 = 0 : Start counting at front end of sensing DOG input
  - b7 = 1 : Start counting at rear end of sensing DOG input
  - b7~b0 = FFH, Without PG0 input
  
- Parameter 15-3 : Setting of CLR signal output (SR+20)
  - b15~b8 : Reference number of CLR output  
( 0~23, it means Y0~Y23 )
  - b15~b8=FFH, Without CLR output
  
- Parameter 16 : Machine zero point address; the default is 0  
Setting range : -999999~999999 Ps
  
- Parameter 17 : Number of zero point signals (Sensing of PG0 input);  
the default is 1.  
Setting range : 0~255 Count