Err27.4发生时故障排查

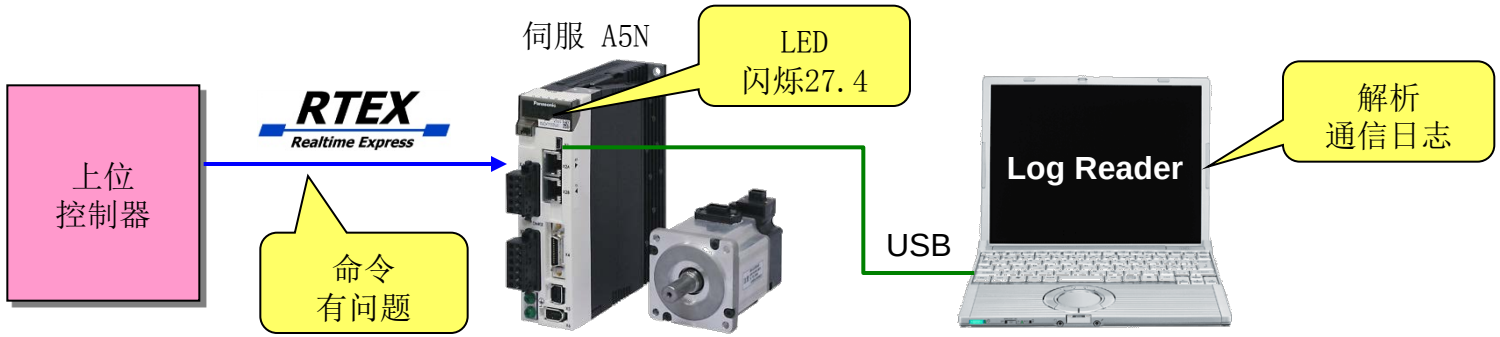
2014/1/23

Motor Business Division
Appliances Company
Panasonic Corporation

Err27.4 指令异常

在参数被恰当设定的状态下发生Err27.4，问题出现在上位控制器给与SERVO 的命令。
请使用通行日志工具”Log Reader”取得报警发生时的日志，进行解析。

项目	内容
控制模式	Cyclic位置控制 (Command Code: 2xh)
检知内容	指令位置变化过大
原因（例）	发生在Servo on中： ・指令的突变 ・Update Counter的异常 发生在Servo off到Servo on变化时： ・Servo off中的指令位置的初始化不完全
处理	修正上位控制器的软件，使命令正常。



通信数据块

命令

16-byte模式 Cyclic位置控制的情况

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	C/R (0)	Update Counter		MAC-ID (0 to 31)				
Byte1	TMG CNT	Command Code (2xh)						
Byte2	Servo On	0	0	Gain SW	TL SW	Homing Ctrl	0	0
Byte3	Hard Stop	Smooth Stop	Pause	0	SL SW	0	EX-OUT2	EX-OUT1
Byte4	Command Data 1 (Command Position)							L
Byte5								ML
Byte6								MH
Byte7								H
Byte8	Command Data 2							L
Byte9								ML
Byte10								MH
Byte11								H
Byte12	Command Data 3							L
Byte13								ML
Byte14								MH
Byte15								H

响应

16-byte模式 Cyclic位置控制的情况

	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	C/R (1)	Update Counter Echo		Actual MAC-ID (0 to 31)				
Byte1	CMD Error	Command Code Echo (2xh)						
Byte2	Servo Active	Servo Ready	Alarm	Warning	Torque Limited	Homing Complete	In Progress	In Position
Byte3	SI-MON5 /E-STOP	SI-MON4 /EX-SON	SI-MON3 /EXT3	SI-MON2 /EXT2	SI-MON1 /EXT1	Home	POT /NOT	NOT /POT
Byte4	Response Data 1 (Actual Position)							L
Byte5								ML
Byte6								MH
Byte7								H
Byte8	Response Data 2 (Actual Velocity)							L
Byte9								ML
Byte10								MH
Byte11								H
Byte12	Response Data 3 (Torque)							L
Byte13								ML
Byte14								MH
Byte15								H

Err27.4 事例

事例1：指令位置的急变

设定电子齿轮为旋转1圈10,000 pulse，更新周期为1 ms的事例。
4,343 pulse是电机约旋转半圈时发生异常变化。

0x1CD806BC → 483,919,548
0x1CD7F5C5 → 483,915,205

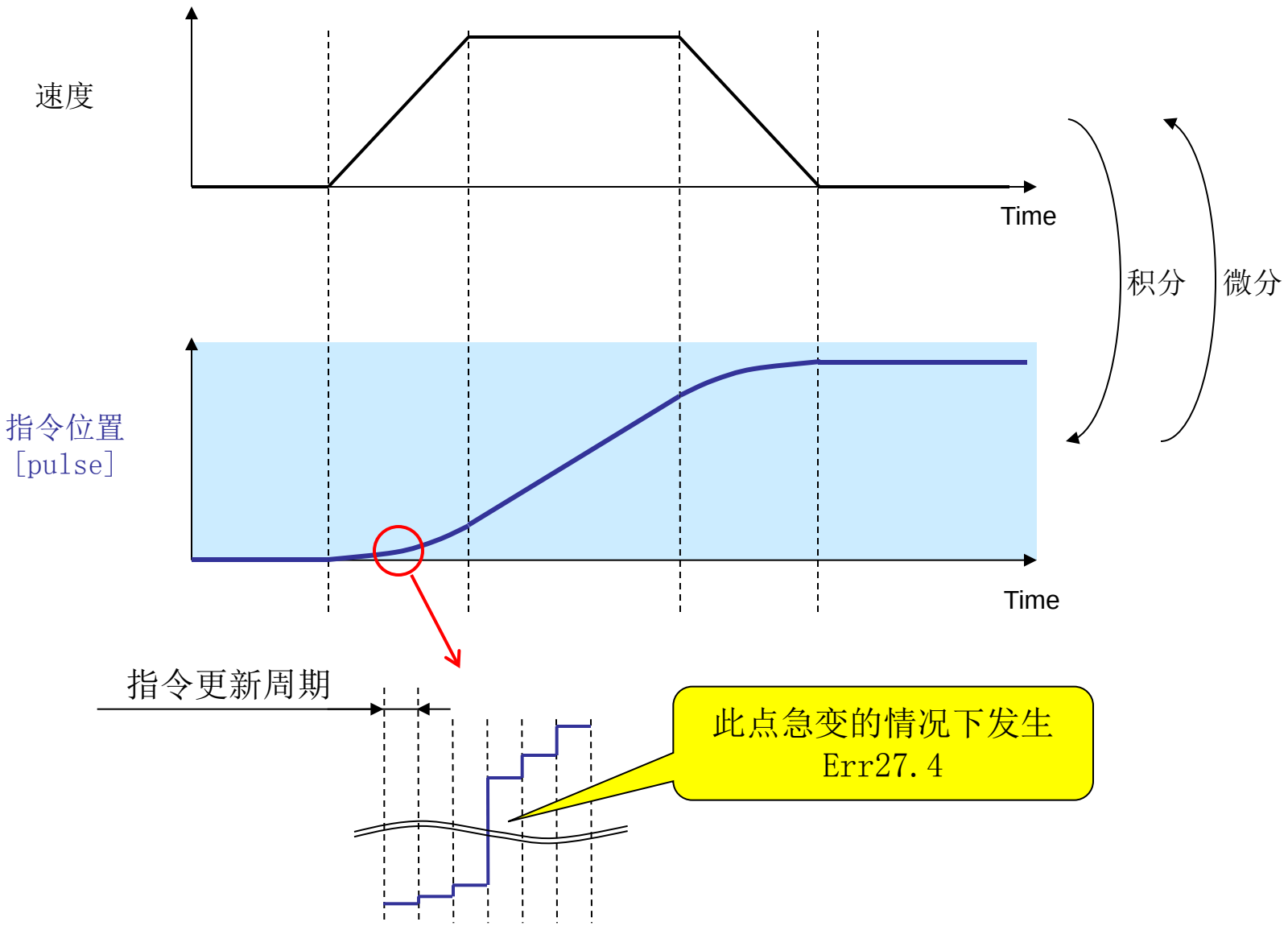
-4,343 pulse

※从异常发生到报警发生的延迟，根据指令滤波器等产生。

234	Recv,21,20,80,00,E8,FE,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,40,EA,D7,1C,14,A3,07,00,31,00,00,00
235	Recv,21,20,80,00,E8,FE,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,3A,EB,D7,1C,1A,A2,07,00,34,00,00,00
236	Recv,41,20,80,00,DD,00,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,35,EC,D7,1C,0E,A4,07,00,32,00,00,00
237	Recv,41,20,80,00,DD,00,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,2F,ED,D7,1C,14,A3,07,00,2F,00,00,00
238	Recv,61,20,80,00,D2,02,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,2A,EE,D7,1C,0E,A4,07,00,2E,00,00,00
239	Recv,61,20,80,00,D2,02,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,25,EF,D7,1C,08,A5,07,00,2E,00,00,00
240	Recv,01,20,80,00,C7,04,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,20,F0,D7,1C,02,A6,07,00,2C,00,00,00
241	Recv,01,20,80,00,C7,04,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,1A,F1,D7,1C,08,A5,07,00,2E,00,00,00
242	Recv,21,20,80,00,BC,06,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,15,F2,D7,1C,02,A6,07,00,2F,00,00,00
243	Recv,21,20,80,00,BC,06,D8,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,0F,F3,D7,1C,02,A6,07,00,2E,00,00,00
244	Recv,41,20,80,00,C5,F5,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,36,F1,D7,1C,FA,E2,04,00,10,00,00,00
245	Recv,41,20,80,00,C5,F5,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,B6,E9,D7,1C,D6,9B,FC,FF,00,00,00,00
246	Recv,61,20,80,00,B9,F7,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,07,E5,D7,1C,D2,13,F7,FF,00,00,00,00
247	Recv,61,20,80,00,B9,F7,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,00,E6,D7,1C,DE,11,F7,FF,00,00,00,00
248	Recv,01,20,80,00,AD,F9,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,F8,E6,D7,1C,F0,0E,F7,FF,00,00,00,00
249	Recv,01,20,80,00,AD,F9,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,C0,43,EF,E7,D7,1C,02,0C,F7,FF,00,00,00,00
250	Recv,21,20,80,00,A2,FB,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,20,43,E5,E8,D7,1C,20,07,F7,FF,00,00,00,00
251	Recv,21,20,80,00,A2,FB,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,20,[illegible],F9,D7,1C,38,03,F7,FF,00,00,00,00
252	Recv,41,20,80,00,97,FD,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,20,[illegible]4,C0,F9,FF,00,00,00,00
253	Recv,41,20,80,00,97,FD,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,20,43,C4,EB,D7,1C,AC,01,02,00,00,00,00,00
254	Recv,61,20,80,00,8C,FF,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,21,43,B7,EC,D7,1C,E0,81,07,00,00,00,00,00
255	Recv,61,20,80,00,8C,FF,D7,1C,00,00,00,00,00,00,00,00,	Send,81,20,21,43,AA,ED,D7,1C,04,7C,07,00,00,00,00,00
256	Recv,01,25,80,00,DB,E9,D7,1C,00,00,00,00,00,00,00,00,	Send,81,25,21,43,9C,EE,D7,1C,00,00,00,00,1B,04,00,00

报警发生

指令位置的急变



事例2：Update Counter的异常

更新周期1 ms，通信周期0.5ms的事例。
Update Counter中2个连续相同的值是正常的，3个连续相同的值则是异常。

异常

```
157 Recv,40,20,80,00,7B,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,DC,0A,00,00,00,00,00,00,00,00,00,00
158 Recv,40,20,80,00,7B,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,28,0C,00,00,00,00,00,00,00,00,00,00
159 Recv,60,20,80,00,83,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,81,0D,00,00,00,00,00,00,00,00,00,00
160 Recv,60,20,80,00,83,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,E3,0E,00,00,00,00,00,00,00,00,00,00
161 Recv,60,20,80,00,83,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,53,10,00,00,00,00,00,00,00,00,00,00
162 Recv,00,20,80,00,8B,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,D1,11,00,00,E9,11,00,00,B8,0B,00,00
163 Recv,00,20,80,00,8B,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,5F,13,00,00,00,00,00,00,00,00,00,00
164 Recv,20,20,80,00,93,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,F5,14,00,00,FA,12,00,00,DC,F5,FF,FF
165 Recv,20,20,80,00,93,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,84,16,00,00,00,00,00,00,00,00,00,00
166 Recv,40,20,80,00,9B,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,05,18,00,00,19,12,00,00,17,08,00,00
167 Recv,40,20,80,00,9B,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,89,19,00,00,00,00,00,00,00,00,00,00
168 Recv,60,20,80,00,A3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,16,1B,00,00,98,12,00,00,49,F7,FF,FF
169 Recv,60,20,80,00,A3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,9D,1C,00,00,00,00,00,00,00,00,00,00
170 Recv,00,20,80,00,AB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,15,1E,00,00,AF,11,00,00,86,08,00,00
171 Recv,00,20,80,00,AB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,8D,1F,00,00,00,00,00,00,00,00,00,00
172 Recv,20,20,80,00,B3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,0D,21,00,00,00,00,00,00,00,00,00,00
173 Recv,20,20,80,00,B3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,87,22,00,00,00,00,00,00,00,00,00,00
174 Recv,40,20,80,00,BB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C8,03,EF,23,00,00,00,00,00,00,00,00,00,00
175 Recv,40,20,80,00,BB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,43,25,00,00,00,00,00,00,00,00,00,00
176 Recv,60,20,80,00,C3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,8A,26,00,00,00,00,00,00,00,00,00,00
177 Recv,60,20,80,00,C3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,D0,27,00,00,00,00,00,00,00,00,00,00
178 Recv,00,20,80,00,CB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,16,29,00,00,00,00,00,00,00,00,00,00
179 Recv,00,20,80,00,CB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,C0,03,5A,2A,00,00,00,00,00,00,00,00,00,00
180 Recv,20,20,80,00,D3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,20,03,9E,2B,00,00,00,00,00,00,00,00,00,00
181 Recv,20,20,80,00,D3,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,20,[illegible]00,00,00,00,00,00,00,00,00,00
182 Recv,40,20,80,00,DB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,20,[illegible]0,00,00,00,00,00,00,00,00,00
183 Recv,40,20,80,00,DB,01,00,00,00,00,00,00,00,00,00,00, Send,80,20,20,03,65,2F,00,00,00,00,00,00,00,00,00,00
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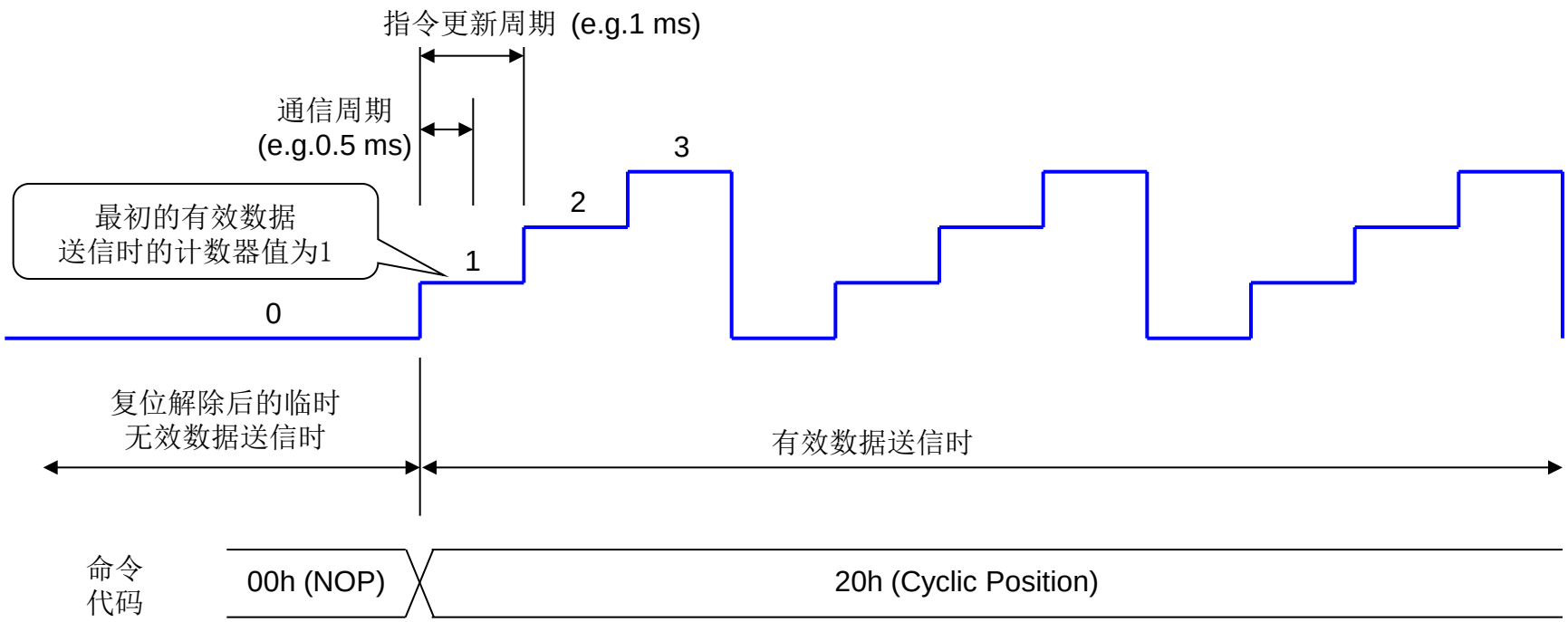
报警发生

Update Counter

在命令更新时序下设定计数值到Update Counter中。
复位解除后无效数据（NOP）送信时为0，最初的有效数据送信时为1，
此后是作为自由计数器的增量。

指令更新周期 ：通信周期 = 2 ：1 的情况



事例3：SERVO OFF中的指令位置的初始化不完全

Servo off中，未根据实际位置对指令位置进行初始化处理。
因此，伺服有效时的指令位置与实际位置有很大的偏差，检测出指令位置的急变，发生Err27.4。

位置产生较大的偏离

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183 Recv,41,20,80,00,04,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
184 Recv,41,20,80,00,04,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
185 Recv,61,20,80,00,27,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
186 Recv,61,20,80,00,27,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
187 Recv,01,20,80,00,4A,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
188 Recv,01,20,80,00,4A,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
189 Recv,21,20,80,00,6D,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
190 Recv,21,20,80,00,6D,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
191 Recv,41,20,80,00,90,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,41,03,00,00,00,00,00,00,00,00,00,00,00,00
192 Recv,41,20,80,00,90,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C1,03,00,00,00,00,00,00,00,00,00,00,00,00
193 Recv,61,20,80,00,B3,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C1,03,1E,01,00,00,00,00,00,00,00,00,00,00
194 Recv,61,20,80,00,B3,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C1,03,77,04,00,00,00,00,00,00,00,00,00,00
195 Recv,01,20,80,00,D6,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C1,03,B3,06,00,00,00,00,00,00,00,00,00,00
196 Recv,01,20,80,00,D6,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C0,03,B3,06,00,00,00,00,00,00,00,00,00,00
197 Recv,21,20,80,00,F9,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C0,03,B3,06,00,00,00,00,00,00,00,00,00,00
198 Recv,21,20,80,00,F9,06,00,00,00,00,00,00,00,00,00,00, Send,81,20,C0,03,B3,06,00,00,00,00,00,00,00,00,00,00
199 Recv,41,20,80,00,1C,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,C0,03,B3,06,00,00,00,00,00,00,00,00,00,00
200 Recv,41,20,80,00,1C,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,21,03,B3,06,00,00,00,00,00,00,00,00,00,00
201 Recv,61,20,80,00,3F,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,21,03,B3,06,00,00,00,00,00,00,00,00,00,00
202 Recv,61,20,80,00,3F,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,21,03,B3,06,00,00,00,00,00,00,00,00,00,00
203 Recv,01,20,80,00,62,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,21,03,B3,06,00,00,00,00,00,00,00,00,00,00
204 Recv,01,20,80,00,62,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,21,03,B3,06,00,00,00,00,00,00,00,00,00,00
205 Recv,21,20,80,00,85,07,00,00,00,00,00,00,00,00,00,00, Send,81,20,21,03,B3,06,00,00,00,00,00,00,00,00,00,00
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指令位置
0x00000690

实际位置
0x00000000

此处SERVO
有效

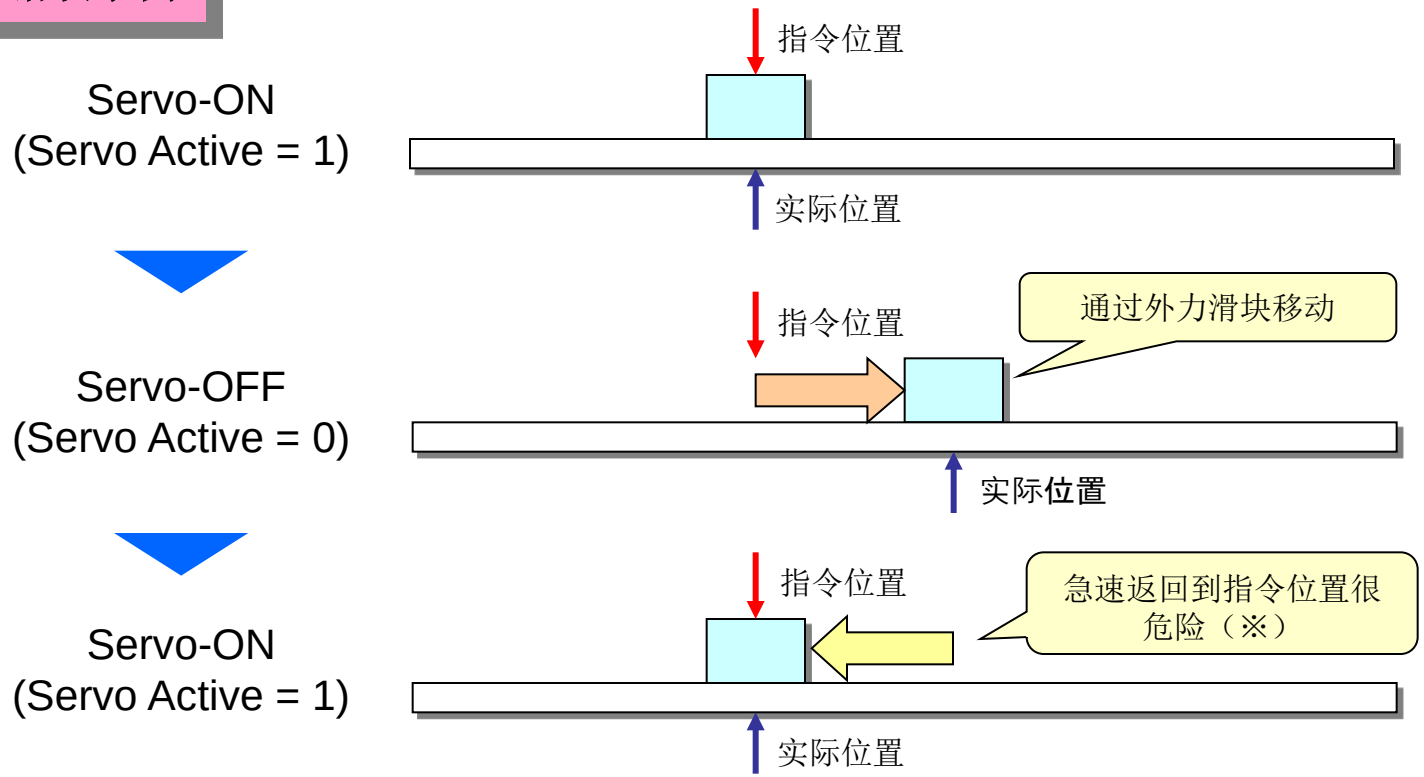
报警发生

※电子齿轮设定为旋转1圈10,000 pulse的事例

SERVO OFF中的指令位置

Servo Active为0期间，请根据实际位置初始化周期的指令位置。
如果没有执行的话，因为指令位置是根据绝对位置进行传送，一旦Servo off中有外力使实际位置发生变化，再次Servo on时急速返回到指令位置是很危险的。（※）

错误事例



※发生指令异常Err27.4报警。

参数设定

Err27.4在参数设定不合适的情况也会发生。

指令更新周期和通信周期

根据上位控制器的规格，请设定与周期相关的参数。

Pr7.20	Pr7.21	指令更新周期	通信周期	最大轴数		可能的控制模式	全闭环控制（※）
				16byte模式 Pr7.22 bit0=0	32byte模式 Pr7.22 bit0=1		
6	1	1.000 ms	1.000 ms	32	16	PP, CP, CV, CT	○
3	2	1.000 ms	0.500 ms	32	16	PP, CP, CV, CT	○
3	1	0.500 ms	0.500 ms	32	16	PP, CP, CV, CT	○
1	1	0.166 ms	0.166 ms	10	-	CP, CV, CT	-
0	2	0.166 ms	0.083 ms	5	-	CP, CV, CT	-

※全闭环控制时Pr0.01=6，半闭环控制时Pr0.01=0。

驱动禁止输入

因为驱动禁止输入的控制是上位控制器执行，所以Pr5.04设定为1（出厂值），请将SERVO 控制设为无效。同时将Pr7.23的bit2设定为0（出厂值），请让上位控制器通过RTEX途径可以监测驱动禁止输入。

标准出厂设定：【 】

Pr5.04	驱动禁止输入设定	设定范围	单位	属性	标准出货设定	相关模式			
		0～2	—	C	1	P	S	T	F

设定驱动禁止输入(POT、NOT)输入的动作。

请按照上位控制器的规格进行设定。通常控制上位控制器的动作，一般设定为1(无效)。

详情请确认上位控制器的资料。

设定值	动　作
0	POT→正方向驱动禁止，NOT→负方向驱动禁止的功能。 正方向动作时输入POT，Pr5.05根据驱动禁止时时序停止，负方向动作时输入NOT会进行相同的动作。 不管动作的状态，将驱动禁止方向的转矩设为0。
【1】	POT、NOT无效时，不影响动作。
2	POT/NOT各自输入时，会发生Err38.0「驱动禁止输入保护」

注 意

目标原点复位动作中Pr5.04(驱动禁止输入设定)、Pr5.05(驱动禁止时时序)的设定会短暂性无效，作为反转信号使用。

不使用驱动禁止输入而使用目标原点复位功能时，请在通用输入中，分配驱动器禁止输入(POT/NOT)。仅是Pr5.04=1时不为无效，作为反转信号使用。

关于目标原点复位功能的详情请确认上位控制器的资料。