客服热线 400 - 820 - 9595

绵密网络 专业服务

中达电通已建立了 71 个分支机构及服务网点，并塑建训练有素的专业团队，提供客户最满意的服务，公司技术人员能在 2 小时内回应您的问题，并在 48 小时内提供所需服务。

上海
电话 :(021)6301-2827

南昌
电话 :(0791)8625-5010

合肥
电话 :(0551)6281-6777

南京
电话 :(025)8334-6585

杭州
电话 :(0571)8882-0610

武汉
电话 :(027)8544-8475

长沙
电话 :(0731)8549-9156

南宁
电话 :(0771)5879-599

厦门
电话 :(0592)5313-601

广州
电话 :(020)3879-2175

济南
电话 :(0531)8690-7277

郑州
电话 :(0371)6384-2772

北京
电话 :(010)8225-3225

天津
电话 :(022)2301-5082

太原
电话 :(0351)4039-475

乌鲁木齐
电话 :(0991)4678-141

西安
电话 :(029)8836-0780

成都
电话 :(028)8434-2075

重庆
电话 :(023)8806-0306

哈尔滨
电话 :(0451)5366-0643

沈阳
电话 :(024)2334-16123

长春
电话 :(0431)8892-5060

台达 DELTA
中达电通股份有限公司

地址：上海市浦东新区民夏路238号
邮编：201209
电话：(021)5863-5678
传真：(021)5863-0003
网址：http://www.deltagreentech.com.cn

扫一扫，关注官方微信

AX-3-0339410-03
2021/03/26

中达电通公司版权所有
如有改动,恕不另行通知

AX-3 系列操作手册

AX-3 系列操作手册

www.deltaww.com

DELTA
Smarter. Greener. Together.

AX-3 K¹ Õ3‹ 1 J

A 5ê ¬Z` ¾X†W&

B/7	#¿6Û!l+	#¸X35Ì7
K çB/	K çB/#¸X3	2020/09/21
K sB/	1.K 1 JÇ#±K2 JÇ •(..."‡7!lÂAX-300NA0PA1 Ú AX-324NA0PA1P ÚAX-308EA0MA1P Fß!Z È0V 2.K 4 JÇ •„5—B/_V Ý6Û5—_ÚKÝ&å4.1.4 Ri(..."‡#ó ;L_[Fk_·"•3Ž" 2î Ë ÚK4.2.1.11 Ri System Setting „5—_V Ý&å6Û5—5n+>[Û5õ2.ÚKRi(..."‡7!l´ AS02PU/AS04PU 5W3U ‹3I2'fç5ÝeÛ Ú(...4‡3K2.5 Ri#¿a¶=ìfK !fÝ5Ý7![Û5õ 3.K 7 JÇ •K 7.4.2 Ri6Û5—_[²N´[Û5õ ÚK4.2.1 Ri_[#©5W ²N´#ó;L_[`Ï ä(.Set‡vo Gear Ratio Setting Oó+• 4_[`Ï ä(..."‡_V Ý&å#±Ný#Þ[Û5õ4.ÚKRi6Û 5—;Lj‹[Û5õ Ú6ÛT;rapeziod ! Trapezoid ÚK 7.5.2 Ri(..."‡_[N«#¿a¶ 4.K 8 JÇ •K 8.2.1 Ri6Û5—_V Ý&å Ú" fK#†8.3K1 Ri OPC UA Server $ "•[‹[¨.](..."‡K 8.3.4 Ri fE Prosys OPC UA Client .áJ²"‡+-P;7! K 9 JÇ •K 9.1.3 Ri(..."‡Startup Checking #± Timeouts [Û5õÚK 9.3.1.2 Ri(..."‡2`<Ï[Û5õ	2021/03/26

AX-3 K¹ Õ3‹ 1 H

E¬.

K 1 JÇ Kg ²

1.1 9i_× 1-2

1.1.1 Fß!Z22!s 1-2

1.1.2 7!I´Kg5ú[Û5õ 1-2

1.2 DIADesigner -AX _V Ý9i_×.....1-7

1.2.1 B`RYKg ².....1-7

K 2 JÇ Y«8# õLâNÆa4OU

2.1 çR Y«8#.....2-2

2.2 CPU : '>Y«8# 2-4

2.2.1 "7!0 PäY«8# 2-4

2.2.2 E >w õa´a¶#±E ;ûY«8#.....2-9

2.2.3 CPU : '>(ýY©,!+ß#±`Ï 4 ²N´ 2- 11

2.2.4 _z!L_z!áJÖ+7a4OU ‹@ 4+• 0 Œ.....2-15

2.3 E >w: '>Y«8# 2-16

2.3.1 çR Y«8#.....2-16

2.3.2 E >w: '>(ýY©,!+ß#±`Ï 4 ²N´ 2-16

2.3.3 JÖ+7a4OU.....2-18

2.4 2P,<: '> 2-18

K 3 JÇ +pX¬ õ$ "•

3.1 HS Ý+pX¬.....3-2

3.1.1 SD #H+pX¬ õ2-fK5 <¼..... 3-2

3.1.2 E <GFk+pX¬ õ2-fK5 <¼.....3-3

3.1.2.1 E <GFk+pX¬.....3-3

3.1.2.2 E <GFk2-fK.....3-4

3.1.3 +pX¬QÚ3Ž" 7Ã.....3-6

3.1.3.1 +pX¬QÚIN +ã_O.....3-6

3.1.3.2 3Ž" 7Ã!lFk+pX¬5 <¼.....3-6

3.1.3.3 3Ž" 7Ã!lFkC–(j> .•Yh<) 3-7
3.1. 3.4 3·j¿2~.Y2W0 Fk3‘5¤..... 3-7
3.1.3.5 3Ž" 7Ã!lFk,!+ßYh<) 3-7
3.2 _V Ý+pX¬ õ#_fK..... 3-8
3.2.1 _V Ý+pX¬..... 3-8
3.2.2 _V Ý#_fK..... 3-15
3.3 _V Ý?§=" õ` [– 3-16
3.3.1 $ "• 3-16
3.3.2 ` [– 3-16

K 4 JÇ 'á7 4´ C
4.1 DIADesigner -AX _V Ý4´ C 4-3
4.1.1 .áJ²h`FÕ..... 4-3
4.2 Device h\gI ²N´ 4-5
4.2.1 "7!#©5W[¥+• 4-5
4.2.1.1 Communication Settings 4-5
4.2.1.2 Applications 4-8
4.2.1.3 Backup and Restore 4-9
4.2.1.4 Files 4- 10
4.2.1.5 Log 4- 10
4.2.1.6 PLC Settings 4- 12
4.2.1.7 PLC Shell 4- 13
4.2.1.8 Users and Groups 4- 14
4.2.1.9 Access Rights 4- 17
4.2.1.10 Symbol Rights 4- 23
4.2.1.11 System Setting 4- 25
4.2.1.12 System Parameters 4- 26
4.2.1.13 Task Deployment 4- 27
4.2.1.14 Status 4- 28
4.2.1.15 Information 4- 28
4.2.2 2P,<: '>#©5W[¥+• 4- 29
4.3 5W3ULb'r õ#¿a¶..... 4- 30
4.3.1 5W3ULb'r..... 4- 30
4.3.2 #¿5W..... 4- 31
4.3.2.1 #¿a¶+Š$1..... 4- 31
4.3.2.2 +â" 4- 32
4.3.2.3 #¿a¶Lb'r 4- 33

4.3.2.4 QÑ+• 05W3ULb'r 4- 37
4.3.2.5 #¿a¶=ìfK !fÝ5Ý7![Û5õ 4- 40
4.4 3Ž" &O#†Cí 4- 41
4.4.1 -Ì C ‹Task Œ 4- 41
4.4.1.1 -Ì C ‹Task ŒLb'r 4- 41
4.4.1.2) -Ì C ‹Task Œ2NX3 ..... 4- 42
4.4.1.3 Watch dog 4- 43
4.4.1.4 ;¶I´ â"ˆLb'r#Ö Ì2NX3Fk_·"•3Ž" 2î Ë 4- 43

K 5 JÇ Hardware Configuration
5.1 Hardware Configuration 5-2
5.1.1 C–(j ²N´ 5-2
5.1.2 5—(…: '> 5-5
5.1.3 " fK: '> 5-7
5.1.4 : '>Fk(ô" /] ñ 5-9
5.1.5 : '>Fk"Q ò/] ñ 5- 11

K 6 JÇ Network Configuration
6.1 Network Configuration 6-2
6.1.1 Kg ² 6-2
6.1.2 'áH' ²N´ 6-3
6.1.3 O8NÃ7•7kFka4OU 6-5
6.1.3.1 a4OURi@ 6-5
6.1.3.2 då3ŒO8NÃ 6-7

K 7 JÇ _·"•3Ž" 'á7 [¥+• õ4´ C
7.1 _·"•3Ž" 2î Ë9i_× 7-5
7.1.1 _·"•3Ž" 2î Ë 7-5
7.1.2 _·"•3Ž" 2î Ë.{E Yh@ 7-5
7.1.3 _·"•3Ž" 2î ËFk!íLb 7-5
7.2 _·"•h`FÕ.áJ²=(Iò 7-6
7.2.1 h`FÕ.áJ²=(Iò&å 7-6
7.2.2 h`FÕ.áJ²=(Iò 7-6
7.3 F¸3Ž õ[ê=2 ..... 7- 13
7.3.1 fE 5 <¼ 7- 13

7.3.2 _[#©5W[¥+•Rê r..... 7-13
7.3.3 =2[¼_[_·_S..... 7- 15
7.4 _·"•3Ž" X¬OU..... 7- 18
7.4.1 _[[¥+• 7- 18
7.4.2 _[²N´ 7- 18
7.4.2.1 _[#©5W ²N´..... 7- 19
7.4.2.2 Iò.v fE _[..... 7- 27
7.4.3 #<_[a4OU=(Iò õ[¥+•;Lj‹ 7- 28
7.4.4 _[N«[¥+•..... 7- 36
7.4.4.1 _[N«#©5W ²N´..... 7- 36
7.4.4.2 Iò.v fE _[N« 7- 38
7.4.5 _[N«a4OU=(Iò õ[¥+•;Lj‹ 7- 39
7.5 _·"•_[#¿a¶ 7- 44
7.5.1 #<_[#¿5W..... 7- 44
7.5.2 _[N«#¿5W..... 7- 46
7. 6 _·"•3Ž" Iò.vNý_x 7- 48
7.6.1 _·"•3Ž" Iò.v 7- 48
7.6.1.1 DIADesigner -AX Ný1÷7•7k õl´Lb 7- 48
7.6.1.2 DIADesigner -AX Fk POU 7- 49
7.6.1.3 DIADesigner -AX 5—(.P.OU 7- 49
7.6.1.4 PDO 6 +ë ‹Mapping Œ..... 7- 52
7.6.2 _[B•/è_S3I 7- 52
7.6.2.1 _[B•/è 7- 52
7.6.2.2 _[N«B•/è..... 7- 54
7.6.3 _·"•3Ž" 2î ËFk2NX3$sB•/è 7- 55
7.6.3.1 2NX32î ËFk'á7 Y«" 7- 55
7.6.3.2 _z!L/ _z!á.üQ 5Ý.v&å..... 7- 57
7.6.3.3 #< ç_·"•2î Ëa´(ô2NX3 2X3 ! 7- 58
7.6.3.4) _·"•2î Ë#ó5Ý$ "• 7- 58
7.6.3.5 _·"•2î Ë#ó5Ý2NX3 2X3 ! 7- 59
7.6.4 4OU..... 7- 64
7.6.4.1 4OUFkl´Lb..... 7- 64
7.6.5 !ß_UXO$s!ß_U7•7k..... 7- 64

7.6.5.1 E +7!ß_U7•7k 7- 64
7.6.5.2 E +7!ß_U.áJ² 7- 65
7.7 _·"•3Ž" "†Pä 7- 69
7.7.1 LâNÆ7•7k 7- 69
7.7.2 #<_[3Ž" 7- 69
7.7.2.1 $O7 #ó;L 4OU: .ö ‹Cyclic Synchronous Position Mode Œ . 7- 69
7.7.2.2 4OUY«!ù: .ö ‹Profile Position Mode Œ 7- 70
7.7.2.3 +• 4 ..... 7- 70
7.7.2.4 C;I5 .ö 7- 71
7.7.2.5 E +7of_U ‹MC_GearIn Œ 7- 74
7.7.2.6 4OU2î+•E +7of_U ‹MC_GearInPos Œ 7- 76
7.7.2.7 E +7!ß_U ‹MC_CamIn Œ 7- 77
7.7.3 ` .•3Ž" 7- 86
7.7.3.1 CSP : .ö 7- 86
7.7.3.2 CSV : .ö 7- 87
7.7.3.3 ` .•Y«!ù: .ö ‹Profile Velocity Mode Œ 7- 87
7.7.4 2TGÐ3Ž" 7- 88
7.7.5 #<_[3Ž" Fk. E "†Pä 7- 89
7.7.5.1 4OU$d Ë 7- 89
7.7.5.2 ` .•$d Ë 7- 90
7.7.5.3 "‡` .• õ!¶` .•$d Ë 7- 91
7.7.5.4 "‡` .•Fk#¿"ýCn ‹]ª.• Œ$d Ë 7- 92
7.7.5.5 _[5 #ø 7- 93
7.7.6 _[N«3Ž" 7- 95
7.7.6.1 _[N«FÛN¦3¹XL 7- 95
7.7.6.2 _[N«W¡5²3¹XL 7-96
7.7.6.3 _[N«$d Ë C;I 7- 97
7.7.7 7 :j¿` IO 7- 98
7.7.7.1 I/O "†Päa4OU 7- 98
7.7.7.2 DIO "†Pä[¥+• 7- 99
7.7.7.3 SSI NýGè&O"†Pä[¥+• 7- 102
7.7.7.4 Pulse Enc Rder"†Pä[¥+• 7-1 08
7.7 .7.5 Capture/Compare "†Pä[¥+• 7- 116

7.7.7.6 Pulse Output "†Pä[¥+• 7- 121
7.7.7.7 j¿` IO e [ÖHU[‹ 7- 126
7.7.8 !]+j"†Pä 7- 127
7.7.8.1 6Û5 C—' 4OU.....7- 127
7.7.8.2 _V Ý7hf7.....7- 128
7.7.8.3 _äfv[Ö-Õ[¥+• 7- 128
7.7.8.4 3!7-@ "†Pä.....7- 129
7.7.8.5 3<30 4OU.....7- 130
7.8 Rê rIò.v 7- 131
7.8.1 [¥(î7•7k 7- 131
7.8.1.1 fE [¥(î 7- 131
7.8.1.2 [¥+• 7- 131
7.8.2 'á7 h`FÕRê r 7- 132
7.8.2.1 !6ôLâNÆServo On 7- 133
7.8.2.2 #<_[e [Öa´OU õF¸3Ž.....7- 134
7.8.2.3 F¸3Ž2î Ëe [Ö 7- 137
7.8.2.4 #<_[4´ CJ²#Z C;I 7- 139
7.8.2.5 #†@ &Å/9.....7- 141
7.8.2.6 NÄ+à #+• 4.....7- 144
7.8.2.7 !ß_U"• C !î3I!ß_UXO 7- 145
7.8.2.8 !ß_U"• C 2NX3 "_[FkFß 4XL f 7- 154
7.8.2.9 Iâ"•3Ž" _®Iò #¿6Û/:"4 4OU 7- 161
7.8.2.10 " µ_[of_U%U#ï_®Iò 2NX3 4Iâ_ä"‡ 7- 166

K 8 JÇ OPC UA Server
8.1 OPC UA Server Kg ² 8-2
8.1.1 .áJ²h`FÕ Fk OPC UA +?#½[¥+•..... 8-2
8.2 .áJ² çR P;7! 8-5
8. 2.1 fE åUaExpert æClient .áJ² çR P;7! 8-5
8.3 .áJ²"‡+-P;7! 8-9
8.3.1 OPC UA Server $ "•[‹[¨ 8-9
8.3.2 [¥+•E 2] #Þ+-Gè 8-9
8.3.3 È â!Ô[¨[¥+• 8-12

8.3.4 fE åProsys OPC UA Client æ.áJ²"‡+-P;7! 8-16

K 9 JÇ ` [–"†Pä

9.1 EtherCAT "†Pä.....9-2

9.1.1 EtherCAT 0"N¦ ²N´ 9-2

9.1.2 EtherCAT "JÀ[¥+• 9-3

9.1.3 EtherCAT µJÀ[¥+• 9-5

9.2 X3 ‹Serial Œ` [– 9-8

9.2.1 Modbus Serial Port !* Ý 9-8

9.2.1.1 Modbus Serial Port !* Ý.áJ² 9-8

9.2.1.2 Modbus Serial Port N« Ýh\gI[Û5õ.....9- 10

9.2.2 Modbus Serial Master 9- 11

9.2.2.1 Modbus Serial Master N« Ý.áJ² 9- 11

9.2.2.2 Modbus Serial Master [¥+•[Û5õ 9- 14

9.2.2.3 Modbus Serial Slav e [¥+•[Û5õ 9- 17

9.2.3 Modbus Serial Slave 9- 22

9.6.3.1 Modbus Serial Slave N« Ý.áJ² 9- 22

9.6.3.2 Modbus Serial Slave [¥+•[Û5õ 9- 24

9.3 Ì) O8NÃ ‹Ethernet Œ` [– 9- 25

9.3.1 Ethernet N« Ý.....9- 25

9.3.1.1 Ethernet N« Ý.áJ² 9- 26

9.3.1.2 Ethernet N« Ýh\gI[Û5õ.....9- 27

9.3.2 Modbus TCP Master 9- 30

9.3.2.1 Modbus TCP Master N« Ý.áJ² 9- 30

9.3.2.2 Modbus TCP Master [¥+•[Û5õ 9- 32

9.3.2.3 Modbus TCP Slave [¥+•[Û5õ 9- 33

9.3.3 Modbus TCP Slave 9- 39

9.3.3.1 Modbus TCP Slave N« Ý.áJ² 9- 39

9.3.3.2 Modbus TCP Slave [¥+•[Û5õ 9- 40

f+/< A 5,fƒ3yfK

A.1 5,fƒ3yfK A-2

A.1.1 'á7 8§7Ì A-2

A.1.2 =ìfKe [ÖB•/è A-2

A.1.3 5,fƒ3yfK=(Iò A-3
A.1.4 7Ì[Ée [Ö[—/< A-3
A.2 CPU : '>5,fƒ3yfK A-6
A.2.1 ERROR @V#Þ çR eÑ@¨ ‹ •0.5 I¹ Ú6~ 0.5 I¹ Œ A-6
A.2.2 ERROR @V#Þ/Ò` eÑ@¨ ‹ •0.2 I¹ Ú6~ 0.2 I¹ Œ A-7
A.2.3 ERROR @V#Þ1I` eÑ@¨ ‹ •1 I¹ Ú6~ 3 I¹ Œ A-7
A.2.4 BAT. LOW @V#Þ. • A-7
A.2.5 BAT. LOW @V#Þ çR eÑ@¨ ‹ •0.5 I¹ Ú6~ 0.5 I¹ Œ A-7
A.2.6 !]+j A-8
A.3 !ä.ö.z5,fƒ3yfK A-9
A.3.1 DL_BuiltInIO_AX3 ..... A-9
A.3.2 _·"•2î ËFß!Z ..... A- 12
A.4 : '>5,fƒ3yfK ..... A- 13
A.4.1 : 2Æ ‹AD/DA/XA Œ#±> .• ‹RTD/TC Œ: '>5,fƒ3yfK ..... A- 13
A.4.1.1 ERROR @V. • ..... A- 13
A.4.1.2 ERROR @VeÑ@¨ ‹ •0.2 I¹ Ú6~ 0.2 I¹ Œ ..... A- 13
A.4.2 AS02LC I×a´: '>5,fƒ3yfK ..... A- 14
A.4.2.1 ERROR @V. • ..... A- 14
A.4.2.2 ERROR @VeÑ@¨ ‹ •0.2 I¹ Ú6~ 0.2 I¹ Œ ..... A- 14
A.5 CPU : '>e [Ö ÊGè+à.{@V#Þ#±B•/è[Û5ã..... A- 15
A.5.1 CPU : '>e [Ö ÊGè+à.{@V#Þ#±B•/è ..... A- 15
A.5.2 : 2Æ õ> .•: '>e [Ö ÊGè+à.{@V#Þ ..... A- 16
A.5.3 AS02LC I×a´: '>e [Ö ÊGè+à.{@V#Þ ..... A- 17

1

Iê1 Iž J> ‰

E¬.

1.1 9i_× 1-2
1.1.1 Fß!Z22!s 1-2
1.1.2 7!I´Kg5ú[Û5õ 1-2
1.2 DIADesigner -AX _V Ý9i_× 1-7
1.2.1 B`RYKg ².....1-7

1

1.1 8@^®

7 22!s3¶_× AX-3 Lâ!þ PLC "7!Iò.v[¥[ˆFß!ZFk!l+ ²N´ •'á7 2î Ë#±.{E 2î Ë4´ C5 <¼[Û5õ Û

1.1.1 E¶ 11 J

AX-3 Lâ!þ PLC Fß!Z22!sFkN«1÷)i òXO2'l! Û[Þ4 a4 fE Û

- z AX-3 Lâ!þ/Ò` !LeÏ22!s •
  "Yh ²N´)i <[•E 2 ' [ÍN-eì[â+s2'6ð22!s 2"4 •Pä!//Ò` Fk.áJ².] fE 7 LâNÆ Û
- z AS Lâ!þHS Ý#±4´ C22!s •
  E ;ûY«8# Ú "7! õ: '>a4N¦ Ú(ýY©#±,!+ßK0 Û
- z DIADesigner-AX fE 22!s •
  !l+ "ì$ _V Ý4´ C5 .ö ÚIò.vNý_x[ÔYç ‹8–/I&å Úha.v"†Pä&å ÚST ‹Structured Text ŒÚ$s"†Pä'> ŒÚIò.v N«N®#<!* ‹POU Œ Ì#± â"ˆ ‹Task ŒFk9i/Ü Ú Ì#±_·"•3Ž" Iò.vFkNý_x5 .ö Û
- z AX-3 Lâ!þ4´ C22!s •
  CPU"†Pä ²N´ Ú#ëh`X¬OU ŰOa4OU ÚHS ÝE ;ûY«8# õ(ýY©,!+ß Ú_·"•3Ž" LâNÆ9i/Ü õ'á7 [¥+•#±5,fƒ3y fKK0 Û
- z AS Lâ!þ: '>22!s •
  B`;q: '> fE ²N´ • r)iO8NÃ: '> Ú: 2Æ: '>#±> .•: '>K0 Û
- z AX Lâ!þ_·"•3Ž" 2î Ë22!s •
  ²N´_·"•3Ž" Iò.vNý_x2'fç fE 2#<_[/) _[_·"•3Ž" 2î Ë Û
- z AX Lâ!þ7î!-2î Ë22!s
  [Û5õNý1÷PLC Iò.v2'fç fE 2.{E 2î Ë Û

1.1.2 5øH‹J>4ÑZ²4Ì

ÄK9	5øH‹"ËH®	Z²4Ì
E >w: '>	AS-PS02	_z!L •100- 240VAC •50/60Hz ‹=(E >w_z!L _z!á ‹ , PLC !l`Ï fE Œ • 24VDC/2A • 48W
	AS-PS02A	_z!L •100- 240VAC •50/60Hz ‹=(E >w_z!L _z!á ‹ , PLC !l`Ï fE Œ • 24VDC/1.5A •36W _z!á ‹ ,(ý`Ï fE Œ • 24VDC/0.5A • 12W
AX-3 Lâ!þ `"_x3Ž" CPU : '>	AX-300NA0PA1	CPU : '> •6] :Kˆ ‹NPN Œ_z!á •!l.á Ethernet 2 port switch Ú RS-485*1 ÚRS-232*1 ÚUSB ` [–#Ê ÚMicro SD #H3Œ#Ê •Iò.v+ a¶ 32MB •5W3U+ a¶32MB •a®E Q T$.öJÖ+7
	AX-324NA0PA1P	CPU : '> •6] :Kˆ ‹ PNP Œ_z!á •!l.á 16 DI ‹ 200KHz Œ Ú8 DO ‹200KHz NPN Œ ÚEthernet 2 port switch ÚRS-485*1 ÚRS-232*1 Ú USB ` [–#Ê ÚMicro SD #H3Œ#Ê Iò.v+ a¶32MB 5W3U+ a¶32MB • a®E Q T$.öJÖ+7

ÄK9	5øH‹"ËH®	Z²4Ì
AX-3 Lâ!þ _·"•3Ž" CPU : '>	AX-308EA0MA1T	8 _[_·"•3Ž" CPU : '> • 6] :Kˆ ‹ NPN Œ_z!á •!l.á Relative Encoder*2 ÚSSI*1 Ú16 DI ‹200KHz Œ Ú8 DO ‹ 200KHz NPN Œ Ú Ethernet 2 port switch ÚEtherCAT*1 ÚRS-485*1 ÚRS-232*1 ÚUSB ` [–#Ê Ú Micro SD #H3Œ#Ê •Iò.v+ a¶32MB •5W3U+ a¶32MB •a® E Q T$.öJÖ+7
	AX-308EA0MA1P	8 _[_·"•3Ž" CPU : '> •6] :Kˆ ‹ PNP Œ_z!á •!l.á Relative Encoder*2 ÚSSI*1 Ú16 DI ‹200KHz Œ Ú8 DO ‹ 200KHz NPN Œ Ú Ethernet 2 port switch ÚEtherCAT*1 ÚRS-485*1 ÚRS-232*1 ÚUSB ` [–#Ê Ú Micro SD #H3Œ#Ê •Iò.v+ a¶32MB •5W3U+ a¶32MB •a® E Q T$.öJÖ+7
	AX-364ELA0MA1T	64 _[_·"•3Ž" CPU : '> •6] :Kˆ ‹ NPN Œ_z!á •!l.á Relative Encoder*2 ÚSSI*1 Ú16 DI ‹200KHz Œ Ú8 DO ‹ 200KHz NPN Œ Ú Ethernet 2 port switch ÚEtherCAT*1 ÚRS-485*1 ÚRS-232*1 ÚUSB ` [–#Ê Ú Micro SD #H3Œ#Ê •Iò.v+ a¶32MB •5W3U+ a¶32MB •a® E Q T$.öJÖ+7
5W 4I/O : '>	AS08AM10N-A	24VDC •5mA •8 @ _z!L •/ B..öJÖ+7#×
	AS08AN01P-A	5 ~ 30VDC • 0.5A/@ •4A/!X@ •8 _z!á@ •>w'r_z!á •/ B..öJÖ+7 #×
	AS08AN01R-A	240VAC/24VDC • 2A/@ •8A/!X@ •8 _z!á@ •NÎE &O •/ B..öJÖ +7#×
	AS08AN01T-A	5 ~ 30VDC • 0.5A/@ •4A/!X@ •8 _z!á@ •>ö'r_z!á •/ B..öJÖ+7 #×
	AS16AM10N-A	24VDC •5mA •16 @ _z!L •/ B..öJÖ+7#×
	AS16AN01P-A	5 ~ 30VDC • 0.5A/@ •4A/!X@ •16 _z!á@ •>w'r_z!á •/ B..öJÖ +7#×
	AS16AN01R-A	240VAC/24VDC • 2A/@ •8A/!X@ •16 _z!á@ •NÎE &O •/ B..öJÖ +7#×
	AS16AN01T-A	5 ~ 30VDC • 0.5A/@ •4A/!X@ •16 _z!á@ •>ö'r_z!á •/ B..öJÖ +7#×
	AS16AP11P-A	24VDC • 5mA • 8 _z!L@ • 5 ~ 30VDC • 0.5A/@ •4A/!X@ •8 _z!á @ •>w'r_z!á •/ B..öJÖ+7#×
	AS16AP11R-A	24VDC •5mA •8 _z!L@ • 240VAC/24VDC • 2A/@ •8A/!X@ •8 _z!á@ •NÎE &O •/ B..öJÖ+7#×
	AS16AP11T-A	24VDC • 5mA • 8 _z!L@ • 5 ~ 30VDC • 0.5A/@ •4A/!X@ •8 _z!á @ •>ö'r_z!á •/ B..öJÖ+7#×
	AS32AM10N-A	24VDC •3.2mA •32 @ _z!L •BBY¹.Ž_Å3Œ&O ‹MIŒ
	AS32AN02T-A	5 ~ 30VDC • 0.1A/@ •3.2A/!X@ •32 @ _z!á •>ö'r_z!á •BBY¹.Ž

ÄK9	5øH‹"ËH®	Z²4Ì
		_Å3Œ&OMIL Œ
	AS64AM10N-A	24VDC •3.2mA •64 @ _z!L •BBY¹.Ž_Å3Œ&O ‹MIŒ
	AS64AN02T-A	5 ~ 30VDC • 0.1A/@ •3.2A/!X@ •64 @ _z!á •>ö'r_z!á •BBY¹.Ž _Å3Œ&OMIL Œ
: 2Æ I/O : '>	AS04AD-A	4 ` `:: 2Æ È#Þ_z!L 16 4!í_•Cn 0~10V • 0/1~5V •- 5V~+5V •- 10~+10V • 0/4~20mA • -20mA~+20mA _S3I5ÝeÛ •2ms/ `:
	AS08AD-B	8 ` `:: 2Æ È#Þ_z!L 16 4!í_•Cn 0~10V • 0/1~5V •- 5V~+5V •- 10~+10V • _S3I5ÝeÛ •2ms/ `:
	AS08AD-C	8 ` `:: 2Æ È#Þ_z!L 16 4!í_•Cn 0/4~20mA •- 20mA~+20mA _S3I5ÝeÛ •2ms/ `:
	AS04DA-A	4 ` `:: 2Æ È#Þ_z!á 12 4!í_•Cn- 10v~10V • 0~20mA •4~20mA _S3I5ÝeÛ •2ms/ `:
	AS06XA-A	4 ` `:: 2Æ È#Þ_z!L 16 4!í_•Cn • 0~10V • 0/1~5V • -5V~+5V • -10~+10V • 0/4~20mA • -20mA~+20mA _S3I5ÝeÛ •2ms/ `: 2 ` `:: 2Æ È#Þ_z!á 12 4!í_•Cn- 10V~10V • 0~20mA •4~20mA _S3I5ÝeÛ •2ms/ `:
> .•: '>	AS04RTD-A	4 ` `: 2 N¦.ö1ý 3 N¦.ö RTD > .•1 =2 1 &O'r.ö • Pt100 / Ni100 / Pt1000 / Ni1000 / JPt100 / LG-Ni1000 & X & X a a !í_•Cn • 0.1 -/0.1 / ‹ 16 4_S3I&O Œ _S3I5ÝeÛ •200ms/ `:
	AS06RTD-A	6 ` `: 2 N¦.ö1ý 3 N¦.ö RTD > .•1 =2 1 &O'r.ö • Pt100 / Ni100 / Pt1000 / Ni1000 / JPt100 / LG-Ni1000 & X & X a a !í_•Cn • 0.1 -/0.1 / ‹ 16 4_S3I&O Œ _S3I5ÝeÛ •200ms/ `:
	AS04TC-A	4 ` `:@ÔE P > .•1 =2 1 &O'r •J ÚK ÚR ÚS ÚT ÚE ÚN ÚB 1ý-100~+100mV !í_•Cn • 0.1 -/0.1 / ‹ 24 4_S3I&O Œ _S3I5ÝeÛ •200ms/ `:

ÄK9	5øH‹"ËH®	Z²4Ì
	AS08TC-A	8 ` `:@ÔE P > .•1 =2 1 &O'r •J ÚK ÚR ÚS ÚT ÚE ÚN ÚB 1ý-100~+100mV !í_•Cn • 0.1 -/0.1 / ‹ 24 4_S3I&O Œ _S3I5ÝeÛ •200ms/ `:
I×a´: '>	AS02LC-A	2 ` `: 4 N¦.ö1ý 6 N¦.öS^a´ 1 &O ‹ Load Cell Œ B`/h # • 1 Ú2 Ú4 Ú6 Ú20 Ú40 Ú80 mV/V 6çj¿!-HU.• •>È"".•Fk 0.04% ADC !í_•Cn • 24 4 _S3I5ÝeÛ •#Ö_ð2Ð.5 ~ 400ms ‹!X 9 h` Œ
Iò.vNý_x E Ní	UC-PRG015-01A‹ 1.5M Œ	PLC _Å3ŒPC 2Iò.vY«!ùE Ní ‹mini USB ŒÊ
	UC-PRG030-01A ‹3M Œ	PLC _Å3ŒPC 2Iò.vY«!ùE Ní ‹mini USB ŒÊ
	UC-PRG030-20A ‹3M Œ	PLC _Å3ŒPC 2Iò.vY«!ùE Ní ‹RJ45 ŒÊ
I/O _Å3ŒN¦	UC-ET010-24B ‹1M Œ UC-ET020-24B ‹2M Œ UC-ET030-24B ‹3M Œ	I/O _Å3ŒN¦BBY¹.ŽŒ 40Pin l 40Pin Œ‹6U$ Œ•éE AS32AM10N-A Ú AS32AN02T-A ÚAS64AM10N-A #± AS64AN02T-A 7!I´ Û
	UC-ET010-24D ‹1M Œ UC-ET020-24D ‹2M Œ UC-ET030-24D ‹3M Œ	I/O _Å3ŒN¦ ‹BBY¹.ŽŒ 40Pin l 20Pin x2 Œ‹,6U$ Œ•_éE AS32AM10N-A ÚAS32AN02T-A ÚAS64AM10N-A #± AS64AN02T-A 7!I´ Û
a4N¦: '>	UB-10-ID16A	I/O a4N¦: '> ‹16 @ _z!L/æŒ 20-Pin BBY¹.ŽŒé E AS32AM10N-A ÚAS32AN02T-A ÚAS64AM10N-A #± AS64AN02T-A 7!I´ Û
	UB-10-ID32A	I/O a4N¦: '> ‹32 @ _z!L Œ‹40-Pin BBY¹.ŽŒé E AS32AM10N-A #± AS64AM10N-A Û
	UB-10-IO32D	BBY¹.Ž_S3I/ B.'rJÖ+7.Ž • 40-Pin BBY¹.ŽFÛ3Œ_S3I40-Pin / B.'r JÖ+7.Ž •_é#ï AS32AM10N-A #± AS32AN02T-A Û
	UB-10-OR16A	I/O a4N¦: '> ‹16 @ NÎE &O_z!á Œ‹20Pin BBY¹.ŽŒ NPN •_éE AS32AN02T-A #± AS64AN02T-A Û
a4N¦: '>	UB-10-OR16B	I/O a4N¦: '> ‹16 @ NÎE &O_z!á Œ‹20Pin BBY¹.ŽŒ PNP Û
	UB-10-OT32A	I/O a4N¦: '> ‹32 @ 6] :K^_z!á Œ‹40- Pin BBY¹.ŽŒ NPN •_éE AS32AN02T-A #± AS64AN02T-A Û
ECAT _· "•3Ž" E Ní	UC-EMC003-02A	EtherCAT ` [–_Å3ŒE Ní •0.3M
	UC-EMC005-02A	EtherCAT ` [–_Å3ŒE Ní •0.5M
	UC-EMC010-02A	EtherCAT ` [–_Å3ŒE Ní •1M
	UC-EMC020-02A	EtherCAT ` [–_Å3ŒE Ní •2M
	UC-EMC050-02A	EtherCAT ` [–_Å3ŒE Ní •5M
	UC-EMC100-02A	EtherCAT ` [–_Å3ŒE Ní •10M

ÄK9	5øH‹"ËH®	Z²4Ì
	UC-EMC200-02A	EtherCAT ` [–_Å3ŒE Ní •20M
	UC-EMC003-02B	EtherCAT ` [–_Å3ŒE Ní •0.3M
	UC-EMC005-02B	EtherCAT ` [–_Å3ŒE Ní •0.5M
	UC-EMC010-02B	EtherCAT ` [–_Å3ŒE Ní •1M
	UC-EMC020-02B	EtherCAT ` [–_Å3ŒE Ní •2M
	UC-EMC030-02B	EtherCAT ` [–_Å3ŒE Ní •3M
	UC-EMC050-02B	EtherCAT ` [–_Å3ŒE Ní •5M
	UC-EMC100-02B	EtherCAT ` [–_Å3ŒE Ní •10M

1.2 DIADesigner -AX ^- ´8@^®

DIADesigner-AX 6 E u#×_¥5— ç Ê3Ž" &OFkIEC 61131-3 NýIò-Ì!^ •.]a®E m) a¶Fk.{E 2î Ë •, !]6 _·"•!ä.ö.z Û) [ÔLâFkC–(j$s#²%kFk4´ C3Œ#Ê !E 2 3· , m ¦" õ6ð5/CnFk.ç#¸C–(j Û

1.2.1 A7Q0J> ‰

DIADesigner-AX #Ö.{E u AX-8 $s AX-3 Lâ!þ Û

- 5 2è IEC 61131-3 Fk2'6ðNý_x&O ‹FBDÚLD ÚST ÚSFC Œ Ì#±#ëI´ ô#óFk7î!-Ný_x&O
- "†Pä/!) û1÷A†Fk!ä.ö.z9i/Ü#Ö ,.{E Iò.va´(ô fE
- _z!L#6"•#ÖE u5W3UFk_z!L$sa4OU
- ' 2'6ð IEC 61131-3 Ný_x&O #Ö fE o 7î$se F¿_ÂX3 ¡0 "ýFkNýIò
- .f<ÂFk[ê[¼$s' N¦"†Pä •#Ö/Ò` ÿ"ý.{E Iò.v ÊGè.]"‡/Ò=2[¼$s[ê[¼` .•
-) I´+p!O"†Pä •#Ö Ä2‹>wIò.v ÊGè.] Ä2‹3Ž" &OFk_·X3
- #ÖNýIòFk[¥(î7LQÑ ô#óFk" ` %-
- E 2 3Œ#ÊFk#Ö2P,<0 $s_é.{0 5ÇhbI¢.ç8-7•
- .ç#¸-Ì!^$s#ÖE +à\HFm6 _ö5õFk!I`ÏNº7k
- [Ÿ) 5ÇO f-1÷Fk-Ì!^#ÖE u#ëI´QÑ"•"ýFk â"^

6ð I´!I.áFka4OU

- HWCONFIG •E ua4OULâNÆFkHS Ý$sKˆCí#©5W
- NWCONFIG •E u ! PLC LâNÆ7•7ka4OUO8NÃ.]KˆCí5W3U ‹3I

Motion 3· , m#ëI´_·"•3Ž" YÊ!š5 8/ •"ì$ PLCopen MC 7î!-"†Pä'> ÚG- Code Ný_x&O É-CAM Ný_x&O $s+• 4[ˆ!ù&åXO-Ì!^K0 Û

- 5 2è PLCopen POU E u#<_[$s) _[_·"•
- 5 2è PLCopen POU Fkf+"‡"†Pä • r)i[±5” Ú C;I$s CAM 3Ž" &O
- E u ô#ó â"^Fkf+"‡ POU • r)iF¸3Ž"•/è5W3U1ý]Æfve [Ö Ú4´ C CAM $s CAM 3Ž" &O
- f-1÷Fk&å/I CAM Ný_x&O •!^6ð +³Fka4OU_ðh`
- 5 2èVA2Æ$s`"_x_[
- _éE u þ) MODBUS $s EtherCAT #6[•Fkf-1÷jX"•&O
- +íjX"•&Oa4OU !7î!-FkC—'![¥(î

MEMO

2

Iê2 Iž X,6ú ÌK¹M•` N,

E¬.

2.1 çR Y«8#.....2-2

2.2 CPU : '>Y«8# 2-4

2.2.1 "7!0 PäY«8# 2-4

2.2.2 E >w õa´a¶#±E ;ûY«8#.....2-9

2.2.3 CPU : '>(ýY©,!+ß#±`Ï 4 ²N´ 2- 11

2.2.4 _z!L_z!áJÖ+7a4OU ‹@ 4+• 0 Œ.....2- 15

2.3 E >w: '>Y«8# 2- 16

2.3.1 çR Y«8#.....2- 16

2.3.2 E >w: '>(ýY©,!+ß#±`Ï 4 ²N´ 2- 16

2.3.3 JÖ+7a4OU.....2- 18

2.4 2P,<: '> 2- 18

2.1 ¾PêX,6ú

g7E¬	X,6ú
3‹ Bm'A<ç-d	-20~55°C*1
f* Bm'A<ç-d	-40~80°C
3‹ Bm'A==-d	5~95% •5ÇNºg
f* Bm'A==-d	5~95% •5ÇNºg
,£ Bm'A	5ÇQ7Vg0 ;û :+?'
*GWƒ N,	3Ž" K˜!l
; 6‘J Me	2
dð1bJ Me	IP20
EMC X,QÁ	[Þ#©Oê òXŒMI ÚEMS õ +ã2~2W.•=2[¼ Û
NÎ1íl!f	Tested with • 5 Hz ‰ƒ ‰8.4 Hz •constant amplitude 3.5 mm ž 8.4 Hz ‰ƒ ‰150 Hz •constant acceleration 1g Duration of oscillation •10 sweep cycles per axis on each direction of the 3 mutually perpendicular axes &äf,7î!-Y«Rê IEC 61131-2 & IEC 60068-2-6 ‹TE ST Fc Œ
p ¹	Tested with • Half-sine wave • Strength of shock 15 g peak value • 11 ms duration ž Shock direction •The shocks in each in direction per axis •on 3 mutually perpendicular axes ‹to tal of 18 shocks Œ &äf,7î!-Y«Rê IEC 61131-2 & IEC 60068-2-27 ‹T EST Ea Œ
*G &X,QÁ	IEC 61131-2 ÚUL508
^ÀCæ'å:Ò"l	4´ C •1080 ~ 795hPa ‹Fß/: u=^2» - 1000 ~ 2000 !S,! Œ •+? •1080 ~ 660hPa ‹Fß/: u=^2» - 1000 ~ 3500 !S,! Œ

*1 •' fE "4hb u4´ CC–(j> .•C–(jRê&Û!l5%OU ç+ö5Ý Ì ñ •.]HU Ä "7!> .• u#Ö4´ CC–(j> .•Rê&Û!l5 #Ö fE Û

z EMI

I-"¡	gOBEQÁ%²	J MeoÑ6Å „oÒ	"€NÁ6Å „
'Ô'±I-"¡oÑ^N*ÂoÒ oÑ%ł0 **ø\›Hy< `•oÒ	30-230 MHz	!-,× # 40dB ‹ 9 PŒ	IEC 61000-6-4
	230-1000 MHz	!-,× # 47dB ‹ 9 PŒ	
AC Có=NI-"¡oÑ Þ*ºoÒ	0.15-0.5 MHz	!-,× # 79dB ‹ 9 Œ	IEC 61000-6-4
		.Z'. 66dB ‹ 9Œ	
	0.5-30 MHz	!-,× # 73dB ‹ 9 Œ	
		.Z'. 60dB ‹ 9Œ	

z EMS

Bm'ABn[	"€NÁ6Å „	< Z“		< Z“J Me
f Có3üCó	IEC 61000-4-2	3ŒYÍ		“ N 9
		Ja;û		“ N 9
*ÂgOCóG•%øZÁ-	IEC 61000-4-3	80% AM • 1kHz ;J/ <É	2.0-2.7 GHz	9 P
			1.4-2.0 GHz	9 P
			80-1000 MHz	9 P
Có=NgOBEG•%ø	IEC 61000-4-8	60 Hz		$ P
		50 Hz		$ P

z Þ*º1U1.-d< Z“

Bm'ABn[		.©^ÝFj4´OÇ p	i–O»`•<(<J	*ÂgO-01.
"€NÁ6Å „		IEC 61000-4-4	IEC 61000-4-5	IEC 61000-4-6
D f / ^ØZmI-"¡	A7*XD f / ^ØZmI-"¡	< Z“J Me	< Z“J Me	< Z“J Me
5W3U _z	,6U$E Ní	N 9	N 9 & 0	9
	gE,6U$E Ní	N 9	N 9 & 0	9
5W 4$s : 2Æ , 2	$ & , ‹gE,6U$ Œ	N 9	N 9 & 0 N 9 ' 0	9
	: 2Æ1ý ' & , gE,6U$ Œ	N 9	N 9 & 0	9
	2'6ð,6U$N¦ ‹3Œ' Œ	N 9	N 9 & 0	9
X¬OUE >w	AC E >w	N 9	N 9 & 0 N 9 ' 0	9
	DC E >w	N 9	N 9 & 0 N 9 ' 0	9
, Æ >w $s_l"•E >w_z!á	$ & , $ AC _l"•E >w	N 9	N 9 & 0 N 9 ' 0	9
	' & , s DC _l"•E >w	N 9	N 9 & 0 N 9 ' 0	9

2.2 CPU 8ß& X,6ú

2.2.1 ù5ø.åO»X,6ú

z ^ù^O2e ô%&

g7E¬				AX-300NA0PA1	AX-324NA0PA1P
'ÂBÄ4´d²	1Å ¢^ŽW 4´d²	LD 1Å ¢		5 ns	
		JU4.1Å ¢ÞÑLREAL 4.2,K9&IoÒ		36 ns	
HÉ-M	HÉ-M*w`•	*w`•		8 MB	
	"–`• C*	5Ç ›1¿ + .å	Retain	768 KB ‹"ì$ X¬OU!l+?%M Œ	
			Persist	128 KB	
		4ž ›1¿+ .å		16 MB	
	WƒN, C* oÑ%MoÒ	*ø*¶		512 KB	
USB &ž	&ž4.			1	
	^œ2c&I-Í			Mini USB	
RS-232 &ž	&ž4.			1	
	Þ^Q^ÝBE			9,600 Ú19,200 Ú38,400 Ú57,600 Ú76,800 Ú 115,200 bps	
	^ØZm6ú-Í			Stop bit • 1 Ú2 žParity bit • None Ú2 G ÚEven ž Data bit • 7 Ú8	
	^ØZm" Zl			0 2 ' % 8 6 $ 6 & , , 5 7 8	
RS-485 &ž	&ž4.			1	
	Þ^Q^ÝBE			9,600 Ú19,200 Ú38,400 Ú57,600 Ú76,800 Ú 115,200 bps	
	^ØZm6ú-Í			Stop bit • 1 Ú2 žParity bit • None Ú2 G ÚEven ž Data bit • 7 Ú8	
	^ØZm" Zl			0 2 ' % 8 6 $ 6 & , , 5 7 8	
TCP	MODBUS TCP	O 5ø4.		32 ‹ Server + Client Œ	
	SOCKET	TCP O 5ø4.			
	MODBUS TCP	" IÒO 5ø5¾'å4.2,d=-d		100 words	
	SOCKET	" IÒ1Å ¢5¾'å4.2,d=-d		8 KB	

g7E¬			AX-300NA0PA1	AX-324NA0PA1P
EtherNet/ IP	CIP 5Ë!_K9&I_ IO Connection	"-^œ2c ŒI—4.oÑdapter oÒ	8	
		Input oÑT-> OoÒO 5ø4.	64	
		Output oÑO>ToÒO 5ø4.	64	
		*¿!Ã Þ^¿d²eR4´d²oÑRPIoÒ	20 á1,000ms ‹#< 4 ! 1ms Œ	
		5¾'å^ØZmO»!Y	3,000 pps	
		" IÒO 5ø5¾'å4.2,d=-d	500 bytes	
	CIP 5Ë!_K9&I_ Explicit Message	Class 3 / UCMM	Get_Attribute_Single ‹FB Œ Get_Attributes_All ‹FB Œ Set_Attribute_Single ‹FB Œ Set_Attributes_All ‹FB Œ	
		3í1¿ CIP *·[	Identity Ú 0 H V V D J H 5ÚRAssembly Ú Connection Manager ÚPort Ú7 & 3 , 3 L Q W H U I Ethernet link Ú 9 H Q G R U V S H F L I L F	
OPC UA 5Ë!_%&	3í1¿EB` N,4E ´ ±ß&I		3 / & R S H Q D Q G 2 3 &)•R2X3Q&G D8W L R Information Model for IEC 61131-3	
	gBZ|I-?w ±I-"¡		TCP •4840 ‹ 5 H F R Q I L J XiaU ConfigurationY file Œ	
	Session oÑClient I-oÒ5¾'å4.`•		5	
	5Ë!_%&42 EBE•2eg7E¬5¾'å4.`•		1000	
	E•2eg7E¬EBSampling Rate oÑmsoÒ		100 Ú300 Ú500 Ú1000 Ú2500 Ú5000	
	5Ë!_%&42 EBZ`dÃ5¾'å4.`•		100	
	"–`•EB5¾'å"- *-¾4.`•		10,000	
	* /"–`•EB Value + .å4.`•		10,000	
	"- *-¾EB6t6B *X 4.		100	
OPC UA 5Ë!_%&	Ë"- * /"–`•EBe ô		- More than three dimensional arrays - Array of Array - 7 K H 2 3 & 8 $ 6 W D F N Z L O O about 300 kB. This is the maximum for values too. - Pointer variables, Interface variables - Structures containing pointers and interfaces	

g7E¬			AX-300NA0PA1	AX-324NA0PA1P
	*G &3ýJ 8ß-Í		None Sign - Basic256Sha256 SignAndEncrypt - Basic256Sha2566	
	-RCæZbZ•	ZbZ•4w;“	X.509 7î!-	
		"- f* EB «Z•4.`•	#¾ È âFk!Ô[¨ • 32 #¸X3Oì!Ô[¨ •32 2¹NÄ=ì#< •32	
	Cæ0õZbZ•	ZbZ•4w;“	E 2 #ôI× +-Gè #&#ô ‹Anonymous Œ	
IO ` N,	1' IO 8ß& 4.`•		32	
	I/O 4.2,*w`•		IN •8,192byte 2 8 7•8,192byte	
	C-¸ IO	High speed counter	-	6 N« ‹200KHz Œ
Zn.„"	SD " K9&I		Micro SD ‹ SDHC • 32GB max Œ	
Å-2"D	-2 ±5Æ ±4£ ±4´ ± Ä ±H• ±4Ý5Ý		fçQÑX3+pX¬-é%€ 5 E <Gx1	

z ^Ž!f2e ô%&

g7E¬				AX-308EA0MA1T AX-308EA0MA1P	AX-364ELA0MA1T
'ÂBÄ4´d²	1Å ¢^ŽW 4´ d²	LD 1Å ¢		5 ns	
		JU4.1Å ¢ÞÑLREAL 4.2,K9&IoÒ		36 ns	
HÉ-M	HÉ-M*w`•	*w`•		8 MB	
	"–`• C*	5Ç ›1¿ + .å	Retain	768 KB ‹"ì$ X¬OU!l+?%M Œ	
			Persist	128 KB	
		4ž ›1¿+ .å		16 MB	
	Wƒ N, C* oÑ%MoÒ	*ø*¶		512 KB	
^Ž!f2e ô	2e ô^24.	2e ô^25¾'å ú		16 _[	128 N«
		Ether CAT ^2*		8 _[	64 _[
		Pulse Out ^2		4 _[	4 _[
		E²M}2•W#2e ô5¾'å^24.		6 _[	6 _[
		%Ä-å2•W#2e ô^24.		2 _[	2 _[
	^2M,5¾'å4.			8 _[	8 _[
	^Ž!f2e ô#&5Ý			õ EtherCAT ` [–Fk(ëCí5W3U` [–$O7 Fß#ó	
	¶^,	¶^,4.2,	" ¾Có* ¶^,	256 @	

g7E¬				AX-308EA0MA1T AX-308EA0MA1 P	AX-364EL A0MA1T
		?w4.	W&EB5¾'å?w4.		
			&_¦Có* ¶^, W&EB5¾'å?w4.	20,480 @	
		Có* ¶^,W&5¾'å4.`•		80	
Ethernet I-"¡	I-"¡4.			2	
	A'BÄ+			10BASE- 7 % $ ·67(; % $ ·6T(Switch	
	N Mš1‘1			6 B• ÚN¦'r	
	Þ^¿^Ý-d			0 E S V	
	Þ^QCóMÄ			Category 5e Ì ñ •100 !S,! ‹Max Œ	
	N Mš" Zl			$ 5 3ÚIP ÚTCP ÚUDP Ú 0 2 ' % 8 6 7 &Ú3 (W K H U 1 H W , 3	
USB I-"¡	I-"¡4.			1	
	^œ2c&I-Í			Mini USB	
RS-232 I-"¡ RS-232 I-"¡	I-"¡4.			1	
	Þ^Q^ÝBE			9,600 Ú19,200 Ú38,400 Ú57,600 Ú76,800 Ú 115,200 bps	
	^ØZm6ú-Í			Stop bit • 1 Ú2 žParity bit • None Ú2 G ŒEven ž Data bit • 7 Ú8	
	^ØZm" Zl			0 2 ' % 8 6 $ 6 & , , 5 7 8	
RS-485 I-"¡	I-"¡4.			1	
	Þ^Q^ÝBE			9,600 Ú19,200 Ú38,400 Ú57,600 Ú76,800 Ú 115,200 bps	
	^ØZm6ú-Í			Stop bit • 1 Ú2 žParity bit • None Ú2 G ŒEven ž Data bit • 7 Ú8	
	^ØZm" Zl			0 2 ' % 8 6 $ 6 & , , 5 7 8	
EtherCAT ^ØZmI-"¡	EtherCAT ùI—X,6ú			Class B	
	A'BÄ+			100BASE-TX	
	Þ^¿^Ý-d			100 Mbps	
	1‘1			Line Údaisy chain and branching	
	Þ^QCóMÄ			Category 5e Ì ñ •100 !S,! ‹Max Œ	
	5¾'å* 5ø4.			64	96
	^ØZm#&5Ý			Vá V ‹#Ö Ì V!#< 4[¥+• Œ	
TCP	MODBUS TCP	O 5ø4.		32 ‹ Server + Client Œ	
	SOCKET	TCP O 5ø4.			

g7E¬			AX-308EA0MA1T AX-308EA0MA1P	AX-364ELA0MA1T
	MODBUS TCP	" IÒO 5ø5¾'å4.2,d=-d	100 words	
	SOCKET	" IÒ1Å ¢5¾'å4.2,d=-d	8 KB	
EtherNet/IP	CIP 5Ë!_K9 &I_ IO Connection	"-^œ2c ŒI—4.oÑdapter oÒ	8	
		Input oÑT-> OoÒO 5ø4.	64	
		Output oÑO≻ToÒO 5ø4.	64	
		1c4E Þ^¿d²eR4´d²oÑRPIoÒ	20 á1,000ms ‹#< 4 ! 1ms Œ	
		5¾'å^ØZmO»!Y	3,000 pps	
		" IÒO 5ø5¾'å4.2,d=-d	500 bytes	
	CIP 5Ë!_K9 &I_ Explicit Message	Class 3 / UCMM	Get_Attribute_Single ‹FB Œ Get_Attributes_All ‹FB Œ Set_Attribute_Single ‹FB Œ Set_Attributes_All ‹FB Œ	
		3í1¿ CIP *·[	Identity Ú 0 H V V D J H 5ÚAssembly Ú Connection Manager ÚPort Ú7 & 3 , 3 L Q WÚH U I D F H Ethernet link Ú 9 H Q G R U V S H F L I L F	
OPC UA 5Ë!_%&	3í1¿EB` N,4E´ ±ß&I		3 / & R S H Q D Q G 2 3 &)•R2X3Q&G B$W L R Q Information Model for IEC 61131-3	
	m–ZbI-?w ±I-"¡		TCP • 4840 ‹ 5 H F R Q I L J X U D E O H Y L D F R Q I L J X file Œ	
	Session oÑClient I-oÒ5¾'å4.`•		5	
	5Ë!_%&42 EBE•2eg7E¬5¾'å4.`•		1000	
	E•2eg7E¬EBSampling Rate oÑmsoÒ		100 Ú300 Ú500 Ú1000 Ú2500 Ú5000	
	5Ë!_%&42 EBZ`dÃ5¾'å4.`•		100	
	"–`•EB5¾'å"- *-¾4.`•		10,000	
	* /"–`•EB Value + .å4.`•		10,000	
	"- *-¾EB6t6B *X 4.		100	
	Ë"- * /"–`•EBe ô		- More than three dimensional arrays - Array of Array - 7 K H 2 3 & 8 $ 6 W D F N Z L O O O L P L W P H to about 300 kB. This is the maximum for values too. - Pointer variables, Interface variables - Structures containing pointers and interfaces	
OPC UA 5Ë!_%&	*G &3ýJ 8ß-Í		None Sign - Basic256Sha256 SignAndEncrypt - Basic256Sha2566	

g7E¬			AX-308EA0MA1T AX-308EA0MA1 P	AX-364EL A0MA1T
	-RCæZbZ•	ZbZ•4w;“	X.509 7î!-	
		"- f* EB «Z•4.`•	#¾ È âFk!Ô[¨ • 32 #¸X3Oì!Ô[¨ •32 2¹NÄ=ì#< •32	
	Cæ0õZbZ•	ZbZ•4w;“	E 2 #ôI× +-Gè #&#ô ‹Anonymous Œ	
IO ` N,	1'+ IO 8ß& 4.`•		32	
	I/O 4.2,*w`•		IN •8,192byte 2 8 7•8,192byte	
	C-¸ IO	Encoder	2	
		SSI	1	
		High speed counter	6 N« ‹200KHz Œ	
		Pulse out	4 N« ‹200KHz Œ	
f* "	SD " K9&I		Micro SD ‹ SDHC • 32GB max Œ	
Å-2"D	-2 ±5Æ ±4£ ±4´ ± Ä ±H• ±4Ý5Ý		fçQÑX3+pX¬-é%& 5 E <Gx1	
ø¶	d= * *{ * i–		110mm * 88mm* 100mm	

*<Ï •EtherCAT _[!í !#ó;L_[õ+• 4_[• Ì òXO8#!í" [Û5õ+• 4_[õ#ó;L_[6ç) .áJ²_[5W

g7E¬ 5øH‹	*X ^25¾'å^24.	"Ê:#^25¾'å^24.	*X ^2 +"Ê:#^25¾'å^24.
AX-308EA0MA1T AX-308EA0MA1 P	8	8	8
AX-364ELA0MA1T	64	8	64

2.2.2 Có=N Ì`‹`•"^Có:ÒX,6ú

5øH‹ g7E¬	AX-308EA0MA1T		
Có=NCó"I	9 ' &	9 ' & a	Œ &-15%~+20% Œ
<FNÕ!]BEoŴoÒ	11W	4W	5W
`‹`•oÑ goÒ	380g	240g	300g

z 5øH‹ C-¸4.* ^Q #?woÑ24VDC E²;ÿoÒCó:ÒX,6ú

5øH‹ g7E¬	AX-308EA0MA1T / AX-308EA0MA1 P AX-364ELA0MA1T / AX-324NA0PA1P
^Q #?w4.	16
^Q #EB^œ2c4w-Í	Q T$.öJÖ+7

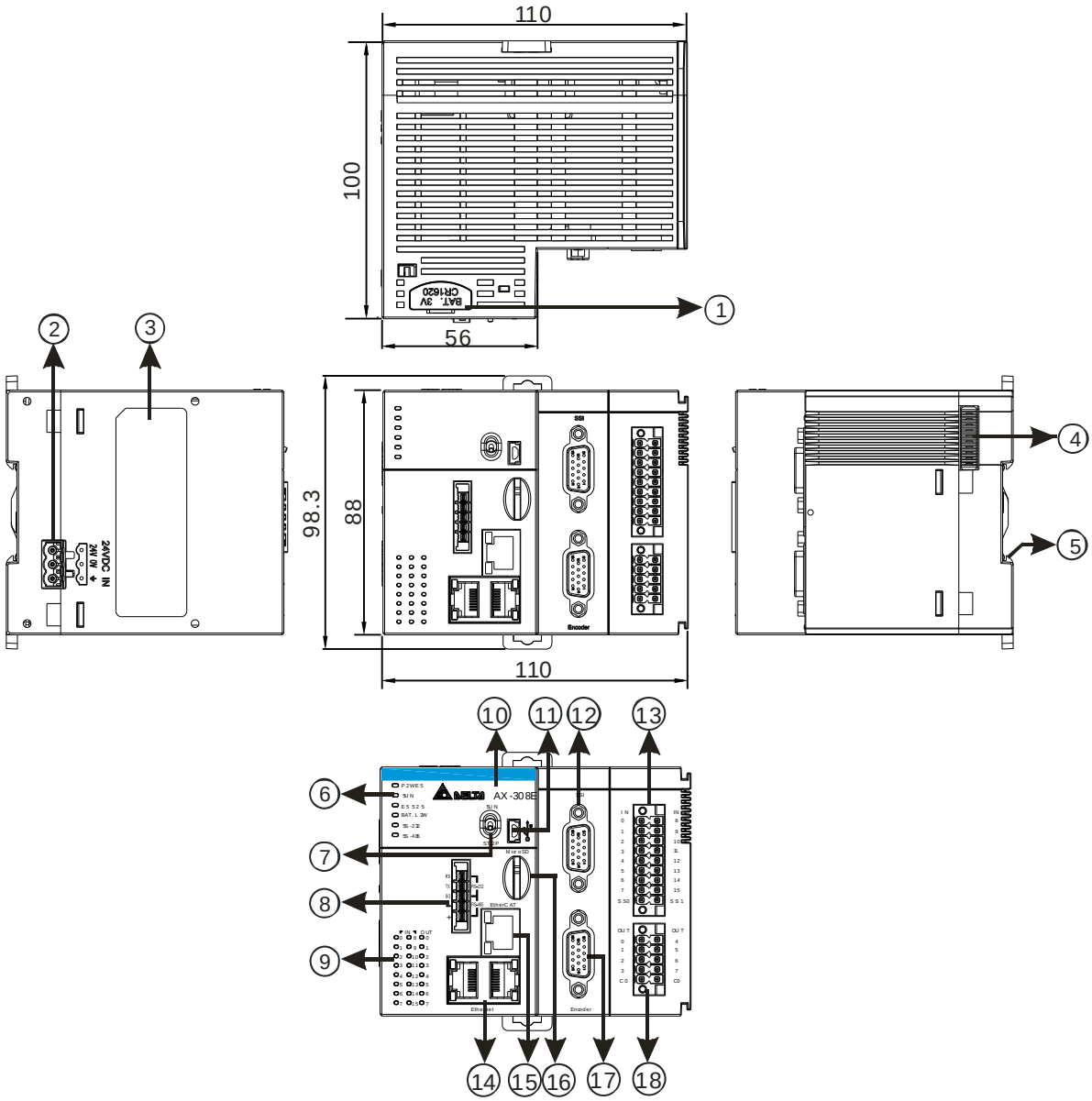
5øH‹ / g7E¬		AX-308EA0MA1T / AX-308EA0MA1P AX-364ELA0MA1T / AX-324NA0PA1P
^Q #?wK9&I		5W+>_z!L
^Q #. -Í		FÛ=(‹>ö'r Sink 1ý>w'r Source Œ
^Q #Có"I/Có;ÿ		9 ' &• 5mA
!f „	2)) : 2 1	! 9 ' &
	2 1 : 2))	9 ' &
"‹-R4´d²	2)) : 2 1	2.5µs
	2 1 : 2))	5 µs
5¾'å^Q #gOBE		200KHz
^Q #dù1U		N
^Q # Ÿ"µ. -Í		>ö'r_z!L ‹Sink Œ NPN .çf-7h_z!L/I.ö >w'r_z!L ‹SourceŒ PNP .çf-7h_z!L/I.ö
^Q #Có\-eRHy		!0P f{I¢
^Q #!f 4üGø		!0P jX"•5Ý •_z!L@ 2îl!@V •

z C-¸4.* ^Q ¸?wCó:ÒX,6ú

5øH‹ / g7E¬		AX-308EA0MA1T AX-364ELA0MA1T	AX-308EA0MA1P AX-324NA0PA1P
^Q ¸?w4.		8	
^Q ¸EB^œ2c4w-Í		Q T$.öJÖ+7	
^Q ¸?wK9&I		6] :Kˆ-T ‹>ö'r Œ	6] :Kˆ-P ‹>w'r Œ
Có"IX,6ú		9 ' &- 15% ~ +20% Œ	
5¾'å[Ý^;	Códù.å	$ @	
	Có/Ý.å	-	
	?-;Ÿ	-	
5¾'å^Q ¸gOBE	Códù.å	200KHz	
5¾'å"‹-R4´d²	2)) : 2 1	2.5µs	

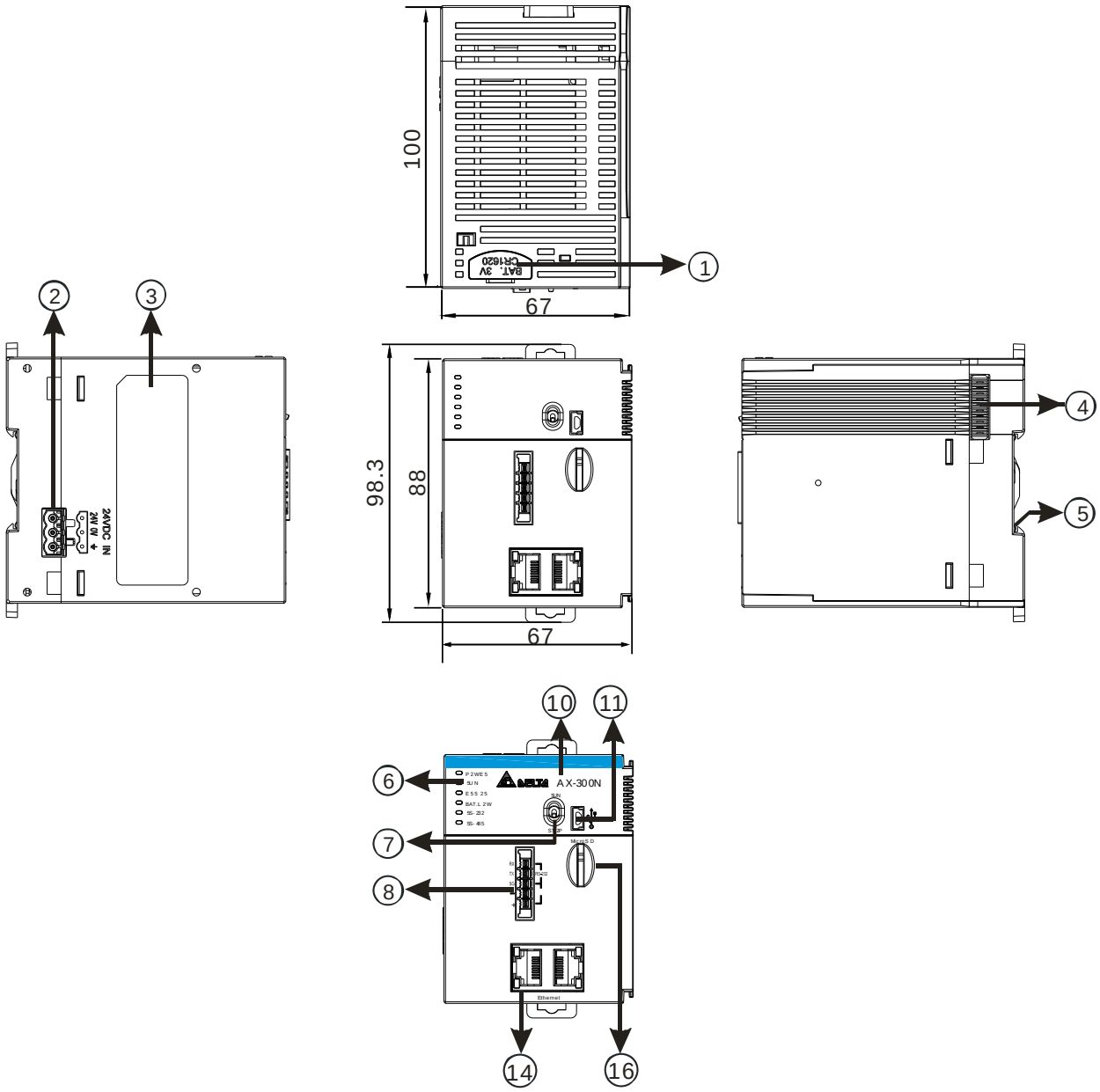
2.2.3 CPU 8ß& 'ÔX€*ø*¶"^_¦ ‰M‹

z AX-308EA0MA1T / AX-308EA0MA1P / AX-364ELA0MA1T

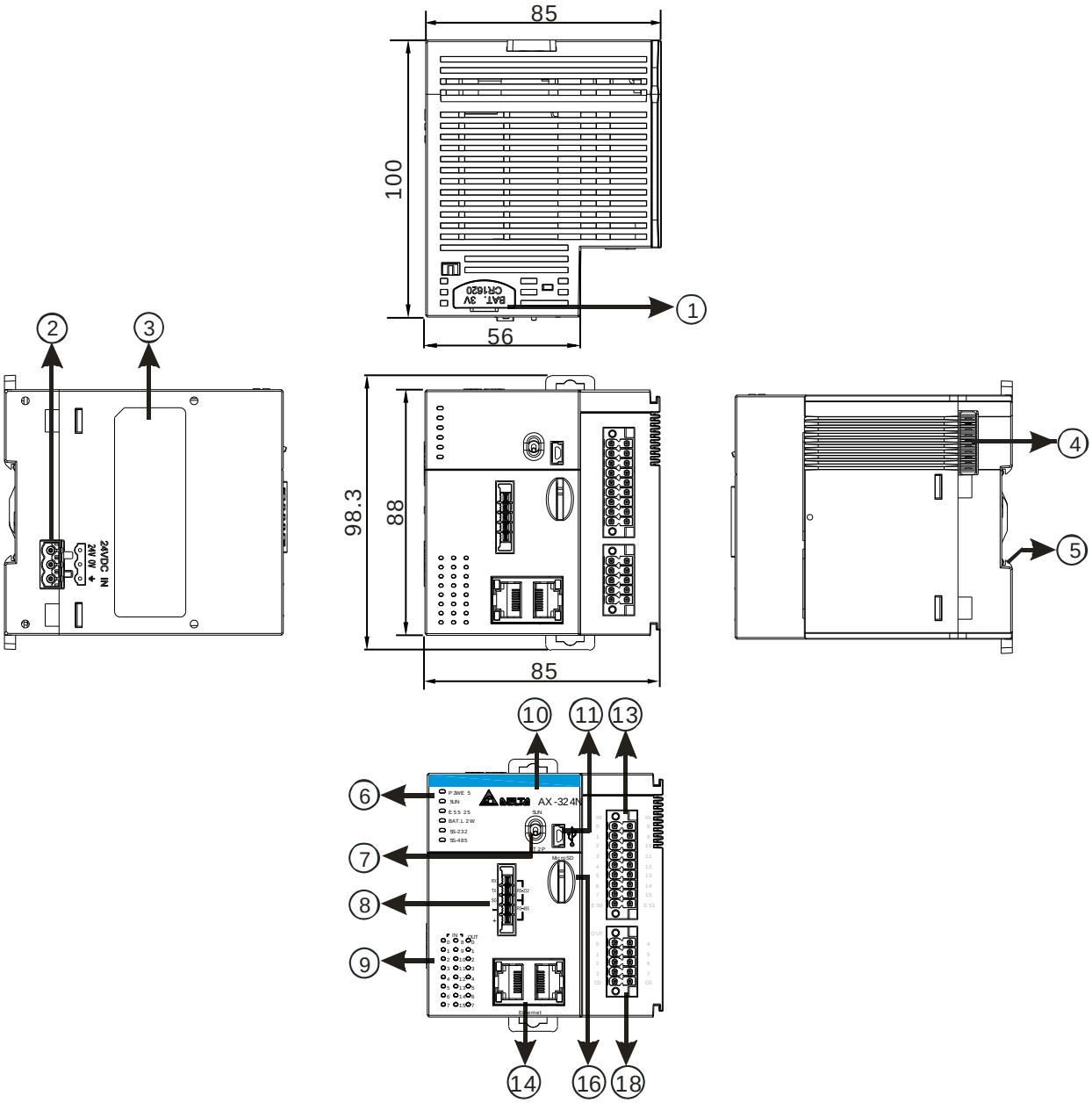


#< 4 •mm

z AX-300NA0PA1



z AX-324NA0PA1P



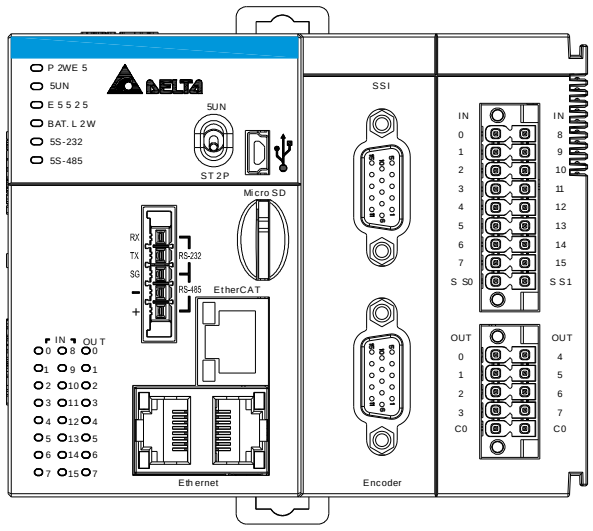
-M"µ	"ËH®	Z²4Ì
1	E <G.Ž	î.[#m"†Pä2' fE FkE <G ‹7 Ž$¨ ôfv7!f+]GE <G Œ
2	E >w_z!L#Ê	,_z!LE >w fE
3	7îKe	dÔB3
4	2P,<: '>` [–JÖ#Ê	,_Å3Œ: '> fE
5	3Œ' / B.	, Ì3Œ'
6	3 2 : (5 / ('	2îl! CPU FkE >wB•/è

-M"µ	"ËH®	Z²4Ì
	5 8 1 / ('	2îl! CPU Fk_·X3B•/è . • •E 2 lò.v2NX3 @V@T •E 2 lò.v C;I eÑ@¨ •E 2 lò.v(ë ue [Ö8§=2 : .ö
	(5 5 2 5 / ('	2îl! CPU Fke [ÖB•/è . • •LâNÆ a´e [Ö#¸E @V@T •LâNÆ;J. eÑ@¨ •LâNÆgE a´e [Ö#¸E
	% $ 7 / 2 : / ('	2îl! CPU FkE <GB•/è
	& 2 0 / (' & 2 0 / ('	2îl! & 2 0Fk` [–B•/è @V@T& 2 05Ç` [– eÑ@¨ •& 2 0` [–
7	5 8 1 6 7P2ç!Z	5 8 1•2NX3E 2 lò.v_·X3 6 7 2 3 C;IE 2 lò.v_·X3
8	& 2 0 3 2 5 7	3· , 5 6485 õ 5 6232 ` [–3Œ#Ê
9	_z!L _z!á2îl!@V	_z!L@ +ã` 5Ý •_z!L2îl!@V •]^ Û _z!á@ +ã` 5Ý •_z!á2îl!@V •]^ Û
10	7!l´#ôl×	"7!7!l´#ôl×
11	USB ` [–JÖ#Ê	3· , mini USB ` [–3Œ#Ê
12	SSI ` [–JÖ#Ê	3· , 6 6 , (1 & 2 ' (`5[–3Œ#Ê
13	_z!L@ JÖ+7	3· ,_z!L@ a4N¦ fE
14	Ethernet ` [–JÖ#Ê	3· , Ethernet Switch ` [–3Œ#Ê 2îl!@V LINK ‹Næ@Œ „ Næ@V. • •O8NÃN¦-Ù_Å3Œ „ @V@T •O8NÃN¦7 _Å3Œ 2îl!@V ACT ‹n«@VŒ „ n«@VeÑ@¨ •5W3U 3ŒE5 „ @V@T •5Ç5W3U _è
15	EtherCAT ` [–JÖ#Ê	3· , EtherCAT ` [–3Œ#Ê 2îl!@V LINK ‹Næ@Œ „ Næ@V. • •O8NÃN¦-Ù_Å3Œ „ @V@T •O8NÃN¦7 _Å3Œ 2îl!@V ACT ‹n«@VŒ ACT „ n«@VeÑ@¨ •5W3U 3ŒE5 „ @V@T •5Ç5W3U _è
16	SD #H3¹9ä	3· , SD #H •+?3Œ#Ê
17	Encoder ` [–JÖ#Ê	3· ,(…a¶'rNýGè&O` [–3Œ#Ê

-M"µ	"ËH®	Z²4Ì
18	_z!á@ JÖ+7	3· ,_z!á@ a4N¦ fE

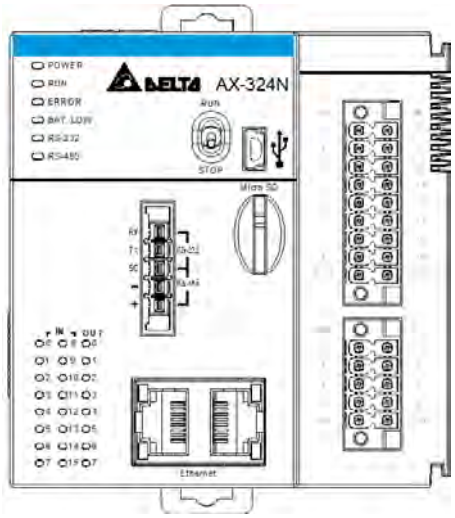
2.2.4 ^Q #^Q ¸I-* ` N,oÑ?w *X oÒ

AX-308EA0MA1T / AX-308EA0MA1P / AX-364ELA0MA1T



SSI		(1 & 2 ' (5		IN	
1	DATA+	1	A1+	0	8
2	DATA-	2	A1-	1	9
6	CLK+	10	B1+	2	10
14	CLK-	11	B1-	3	11
8	GND	4	Z1+	4	12
15	9	5	Z1-	5	13
		15	91	6	14
		3	A2+	7	15
		9	A2-	6 6	6 6
		6	B2+	2 8 7	
		12	B2-	0	4
		13	Z2+	1	5
		14	Z2-	2	6
		7	+5 92	3	7
		8	9	C0	C0

AX-324NA0PA1P



IN	
0	8
1	9
2	10
3	11
4	12
5	13
6	14
7	15
6 6	6 6
2 8 7	
0	4
1	5
2	6
3	7
C0	C0

2.3 Có=N8ß& X,6ú

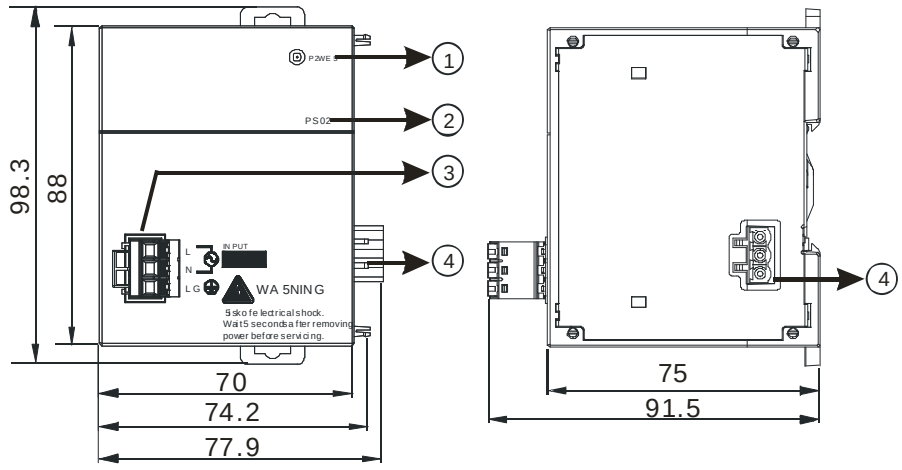
2.3.1 ¾PêX,6ú

z AS-PS02/AS-PS02A

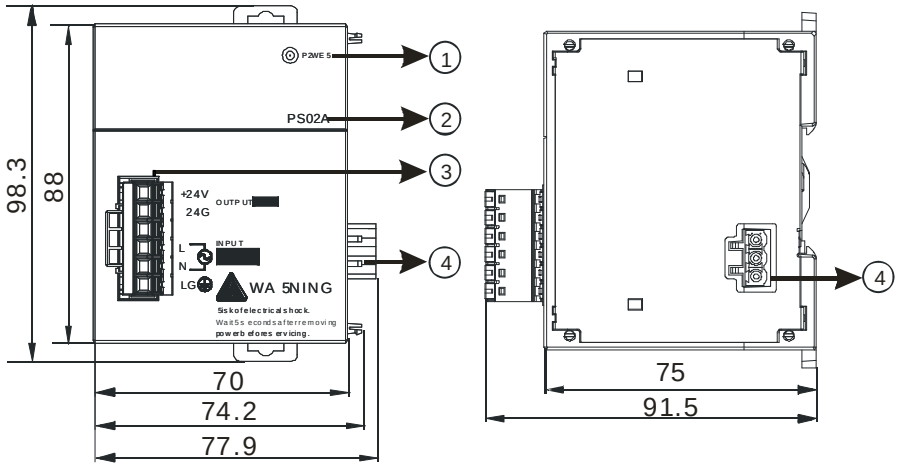
g7E¬		X,6ú
Có=NCó"I		a 9 $ &- 15%~10%Œ +] 5% Û
!f X,6ú		/:_z!LE >w) u 9 $ &5Ý •E >w: '>#Ö;J. "• C Û
ÿZvFjd²4kCó4´d²		E >wG“eÛ5”E10ms Ì!lNÎNÔ_·X3 Û
Có=N ›e' Û*w`•		$ 9 $ &
p ¹Có;ÿ		Ÿ $ # 9 $ &
24VDC Có;ÿ^Q ¸		AS-PS02 •2A • ¬ ,.{!l`Ï "7!#±: '> fE AS-PS02A •1.5A • ¬ ,.{!l`Ï "7!#±: '> fE ž 0.5A • ,(ý`Ï fE
Có=N ›1b		9 ' & _z!á!^GÔ]Ö Ä2‹ • õ_®E =(Ä2‹ Û
Có:ÒeRHy		9 $ & Primary-secondaryŒÉ 9 $ & Primary-PEŒÉ 9 $ &Secondary -PE Œ
M›MÖdù1U		0 Ì ñ ‹2'6ð_z!á !L@ +à' 2eÛ 9 ' & Œ
2c%î		3Œ' a4N¦ 2N¦/k ô/~+ö uE >wJÖ L •N 2N¦/k
`‹`•	AS-PS02	270g
	AS-PS02A	310g

2.3.2 Có=N8ß& 'ÔX€*ø*¶"^_¦ ‰M‹

z AS-PS02



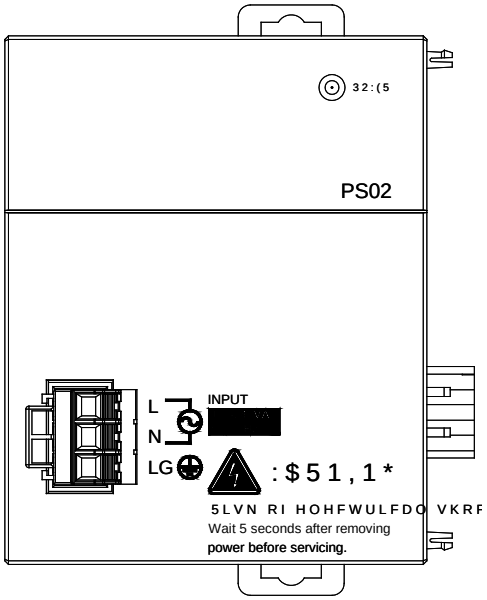
z AS-PS02A



-M"µ	"ËH®	Z²4Ì
1	E >w2îl!@V ‹Næ@V Œ	2îl!E >wFkB•/è
2	7!l´#ôI×	: '>7!l´#ôI×
3	_z!áJÖ+7a4OU ‹ only for AS-PS02A Œ	9 •FÛ=(E >w_z!á • 9 ' & •500mA 24G •FÛ=(E >w_z!á#©Oê'
	_z!LJÖ+7a4OU	L •AC E >w_z!L Line N •AC E >w_z!L Neutral LG •) ' 3Œ' JÖ
4	E >w_z!á#Ê ‹ õ "7!_Å3Œ Œ	

2.3.3 I-* ` N,

z AS-PS02

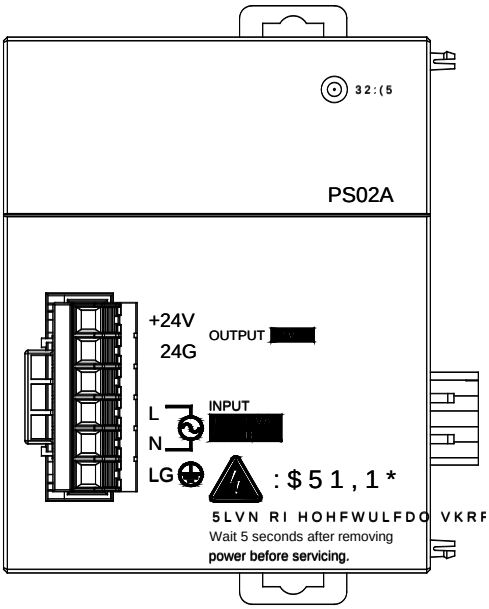


z /1• AC E >w_z!L

z LG •) ' 3Œ' JÖ

z

z AS-PS02A



z 9•_Å3Œ(ý`Ï 9 ' &E >w+

z 24G •_Å3Œ(ý`ÏE >w24G

z /1• AC E >w_z!L

z LG •) ' 3Œ' JÖ

2.4 1'+ 8ß&

AX-3 Lâ!þFk2P,< '>#Ö_Å3ŒAS Lâ!þ: '> •Fß!ZFk: '> È0V[Þ#©Oê AS Lâ!þ: '>22!s Û

3

Iê3 Iž *GWƒ Ì"í!f

E¬.

3.1 HS Ý+pX¬....3-2

3.1.1 SD #H+pX¬ õ2-fK5 <¼....3-2

3.1.2 E <GFk+pX¬ õ2-fK5 <¼....3-3

3.1.2.1 E <GFk+pX¬....3-3

3.1.2.2 E <GFk2-fK....3-4

3.1.3 +pX¬QÚ3Ž" 7Ã....3-6

3.1.3.1 +pX¬QÚIN +ã_O....3-6

3.1.3.2 3Ž" 7Ã!lFk+pX¬5 <¼....3-6

3.1.3.3 3Ž" 7Ã!lFkC–(j> .•Yh<) 3-7

3.1.3.4 3·j¿2~.Y2W0 Fk3‘5¤....3-7

3.1.3.5 3Ž" 7Ã!lFk,!+ßYh<) 3-7

3.2 _V Ý+pX¬ õ#_fK....3-8

3.2.1 _V Ý+pX¬....3-8

3.2.2 _V Ý#_fK....3- 15

3.3 _V Ý?§=" õ` [– 3- 16

3.3.1 $ "•....3- 16

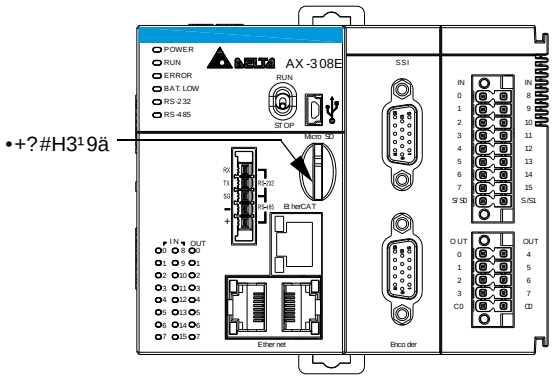
3.3.2 ` [–....3- 16

3.1 G* ´*GWƒ

3.1.1 SD " *GWƒ Ì1„e"4w;“

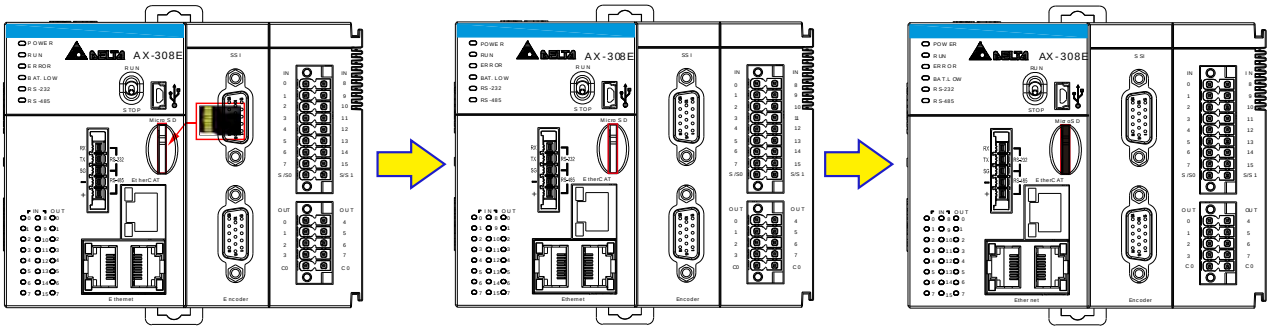
z ù5ø ÈEB f* " 2•8»

"7!Fk •+? #H3¹9ä`äX'+p3y' 7! :;JgI •)i ò&åK”) 7îl!(ë2'I! Û



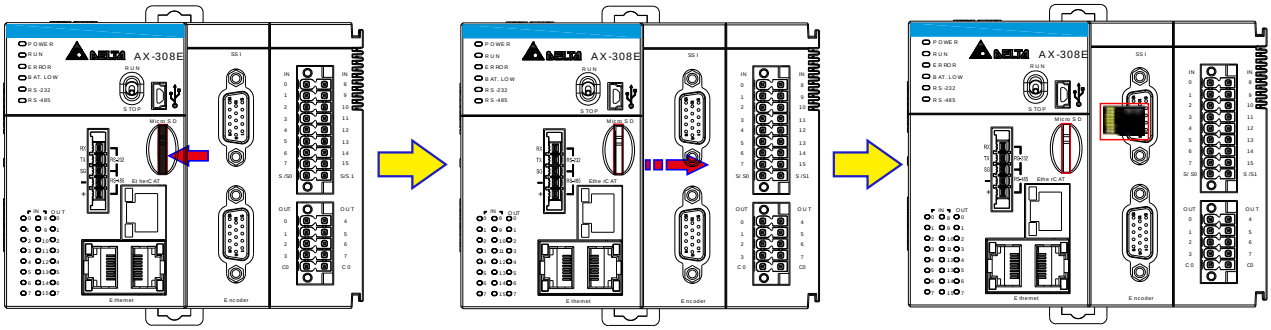
z f* " EB*GWƒ

FÛ3Œ+í •+⁋H'iFÛ' 3¹!L "7!Fk •+?#H3¹9ä.]+í!]3•QÚ.|`Ï •FÛ" $ Y¨#H9'&á+•Fk(×gÚ#Z#Ö Ûha" +pX¬ #õ •SD #H.{[Ì X'BIBIFk&á+• 6 •RÌ ´6 7eQ FkB•/èXOI!.]7 +pX¬;JHU Û#Í(ý • SD #H7 ^'6ðf $-[¥[^ •RÌ SD #H3¹!LFk5 #øe [Ö ¦ 5Ç<¼+í!]3•QÚ3¹9ä.|`Ï •;K5Ý[Þ"æ/!" 3•!L Ì!4` 1÷7! :Fk3F'6 Û3¹!L SD #HFk;J HU5 #ø[Þ#©Oê ò5 &åI! Û



z f* " EB"6e"

FÛ3Œ+í •+⁋H3•QÚ.|`Ï#õ • •+?#H#Z 7eQ / !á •;K5Ý ¦#Ö+í!]#½!á Û



3.1.2 Có; EB*GWƒ Ì1„e'4w;“

3.1.2.1 Có; EB*GWƒ

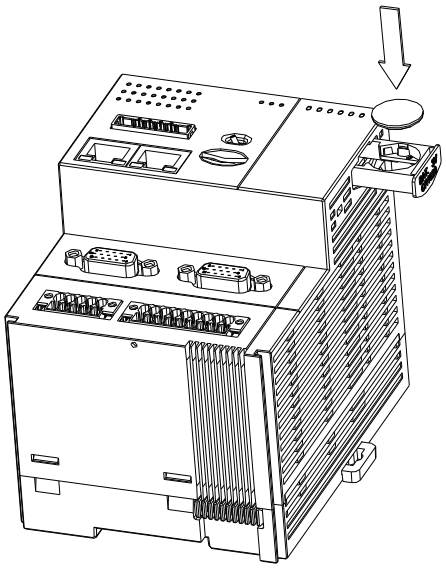
E <G;J. ,E 5Ý •3Ž" &O î.[#m24#Ö Ì[ˆ5Ý Û3Ž" &O!á#i5Ý.] ôf+. E <G •E 2 fçQÑX3+pX¬-é% CR1620 3V E <G ÛK ç; +pX¬E <G5Ý •3Ž" &O' ` E 1ýOì5”E 5Ý`ä#Ö Ì Û+pX¬E <G"4 •/¬hb fE g@E 22)> 1ýOì!/ ` _®3ŒYÍ3Œ' a¸¸EK05 .ö •+í ¡ :Fkg@E a±5%#õ!t_ÂX3+pX¬1ýOì6Û3IE <G Û+pX¬E <G#õ •#Ö` _®_ Ý[¥+• î.[#m5ÝeÛ •+pX¬E <G4´ C;Lj‹)i ò ‹[Þ#©Oê AS500E Lâ!þ_·"•3Ž" &O4´ C22!s •)i ò_×;Lj‹ ŒÛ

3

1. +í ç+>W¡]^+75%' E <G.ŽO!#Ê(ë ‹)i&å 3.1.2.1 2'I! Œ•2».ç_·"•3Ž" &O ñ2¤,0.ö>¸9äFkE <G.Ž Û

&å3.1.2.1

2. +í CR1620 3V E <GE ñOó ò5%!L" AX-3 Lâ!þ3Ž" &OFkE <G.Ž!l •)i&å 3.1.2.2 2'I! Û



&å3.1.2.2

3. E <G5%" E <G.Ž#õ •+í2¤,0.ö>¸9ä3•_Â AX-3 Lâ!þ3Ž" &O •)i&å 3.1.2.3 2'I! Û

&å3.1.2.3

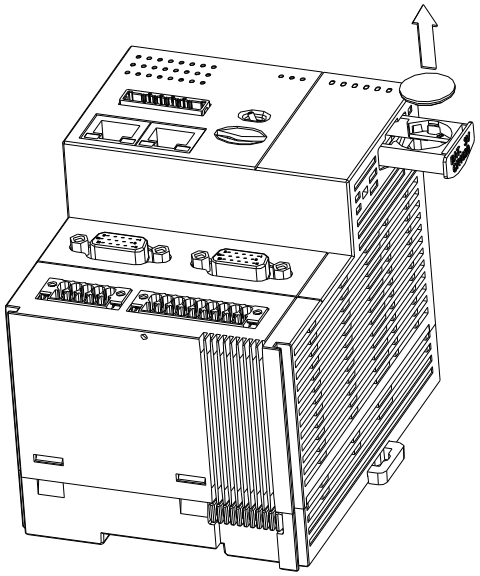
3.1.2.2 Có; EB1„e"

7 +pX¬E <G1ýE <GE #r ô]š5Ý AX-3 Lâ!þ3Ž" &OFkBAT LOW 2îI!@V 6%I!N‰@V• •fçYh+pX¬E <G 1ýOì6Û3IE <G Û.á[• u3Ž" &O` E 5Ý6Û3IE <G •3Ž" &O5”E 6Û3IE <G+í+ãQÛ î.[#m5ÝeÛ0I(ô!á#i # Û6Û3I E <G"4 •/¬hb fE g@E 22)>1ýOì!/ ` _®3ŒYÍ3Œ' Fka¸,EK05 .ö •+í ¡ :Fkg@E a±5%#õ!t_ÂX3+pX¬1ýOì6Û3I E <G Û6Û3IE <G4´ C;Lj‹)i ò ‹[Þ#©Oê AS500E Lâ!þ_·"•3Ž" &O4´ C22!s •)i ò_×;Lj‹ ŒÛ

1. +í ç+>W¡]^+75%' E <G.ŽO!#Ê(ë ‹)i&å 3.1.2.4 2'I! Œ•2».ç3Ž" &O ñ2¤,0.ö>¸9äE <G.Ž Û

&å3.1.2.4

2. +í CR1620 3V E <GE òOó ñ µ3Ž" &OE <G.Ž!l#½!á •A #õ!t+í5—FkE <G5%!L •)i&å 3.1.2.5 2'l! Û



&å3.1.2.5

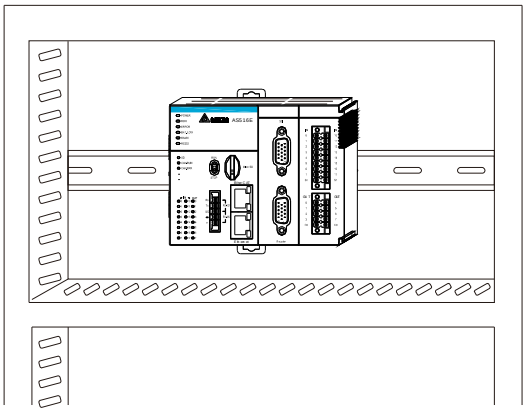
3. 5%!L5—E <G#õ •+í2¤,0.ö>¸9ä3•_âŽ" &O •)i&å 3.1.2.6 2'l! Û

&å3.1.2.6

3.1.3 *GWƒP±2e6ß

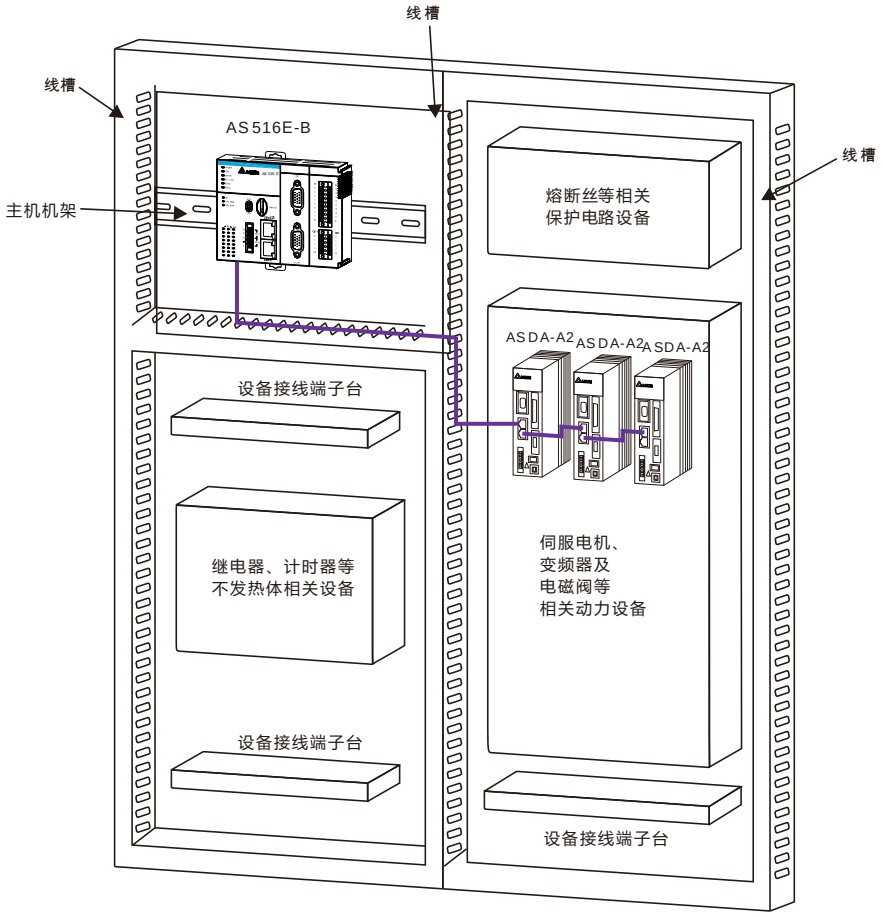
3.1.3.1 *GWƒPÐIN *º^&

+í3Ž" &O: '>.|`Ï&á+•2J2°!á •+í: '>.|`Ï: 9ä#H!L3Ž" 7Ã eÛ+ã_O ñ •!t3• ñ&á+•2J •" 3Ž" &O: '> #Z&á+• u3Ž" 7Ã!l Û‹[Þ#©Oê AS500E Lâ!þ_·"•3Ž" &O4´ C22!s •)i ò&å ÛŒ



3.1.3.2 2e ô6š CEB*GWƒ4w;“

‹[Þ#©OêAS500E Lâ!þ_·"•3Ž" &O4´ C22!s •)i ò&å ÛŒ



3.1.3.3 2e ô6š CEBBm'A<ç-dX?;

z 2e ô6š C*GW∱AX-3 K¹ Õ2e ô%&EBX?; oã

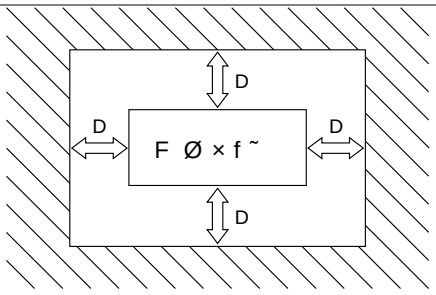
⚠ ⌈M$1
z AX-3 Lâ!þ3Ž" &O' 3Ž" 7Ãa³FkC–(j> .• !- 20~55°C ‹> .• Œ•5 ~ 95% ‹>f.• ŒÛ
z [Þ`f!4+pX¬' j¿Aª@Î1ý> .•5új¿Fk[¥(îf+_¸ Û
z ÄE@]š) Fk` hµJaeÛ Û
z]l_®C–(j> .• 55°C •/¬hb+pX¬hµ2.1ýJa[ê Û
z AX-3 Lâ!þ3Ž" &O ¬Pä u+‹!l fE Û
z ' 3Ž" 7Ã+pX¬5Ý •1.0m~2.0m Fkj¿.•5ú u+pX¬$s4´ C Û
z +pX¬5Ý[Þ_ÃI¢j¿#r[¥(î$s"•",[¥(î Û
z 3Ž" 7Ãa³E]ÖB•/èYh' 5”E 0¬!œ ò •24Pä+pX¬ • ô#Ö. E +pX¬ Û

3.1.3.4 2Ži–1U-01..åEB2h4{

⚠ ⌈M$1
z [Þ`f!4+pX¬' X¬6ðj¿#r[¥(îFk7Ãa³ Û
z +pX¬5Ý[Þ]ÄI¢"•",N¦ 200mm Ì ñ Û
z 3Ž" 7Ãhb3Œ' Û
z)i7ƒ AX-3 Lâ!þ3Ž" &O7 „AN" ` %-2î+•Fk5 .ö fE • AX-3 Lâ!þ3Ž" &O2'3· ,Fk Ä2‹#ÖPä!¶/ Û

3.1.3.5 2e ô6š CEB*ø*¶X?;

z E– C*GWƒ

AX-3 Lâ!þ3Ž" &O' +pX¬5Ý •[Þ+pX¬ u+èeÔ.ö Fk3Ž" K˜!l •]$O&Û.{ Ä2è ç+••FkJaeÛ • ÌHU Ä!]5J@Ô"†Pä;J. •)i#Ú&å2'I! Œ D > 50mm	

' G'22_ÂX3 AX-3 LâNÆFk.ç#¸-Ì C"4 •/¬hb!/!^(î DIADesigner-AX Fk_V Ý •!] !5[LâNÆFkIò.v.ç#¸ Ú HS Ý õO8NÃN«/èFk5[#ï.Z#× Û

3.2 ^- ´*GWƒ Ì"6e"

z K¹M•e¾;

òXO 7îI! m DIADesigner-AX FkLâNÆC–(j Û[Þ#©OêXO8#!l È0V_ÂX3_V Ý+pX¬ Û

g7E¬	K¹M•e¾;
_·X3LâNÆ	DIADesigner-AX V1.0.0 Ì ñ
4´ CLâNÆ	Windows 7 / 8.1 / 10 32/64 bits
CPU	Intel Celeron 540 1.8GHz Ì ñ7!l´ •Intel Core i5 M520 2.4 GHz Ì ñ7!l´
!l+?	2GB Ì ñ ‹.á[• fE 4GB Ì ñ Œ
H¨F¿jX"•&O	+ a¶QÚ+øhb3· ,10GB Ì ñJaeÛ
6%I!&O	!í_•Cn • 1920 x 1080 .á[•6%I![¥OU
e F¿/o 7î	çR Fke F¿o 7î1ý õ Windows !c+ FkX¬OU
` [–3Œ#Ê	Ethernet • USB •Serial port ‹ „3U "7!7 ^'2'3· ,Fk` [–E3gl Œ
_V Ý	hb+pX¬Net Framework 4.6.2

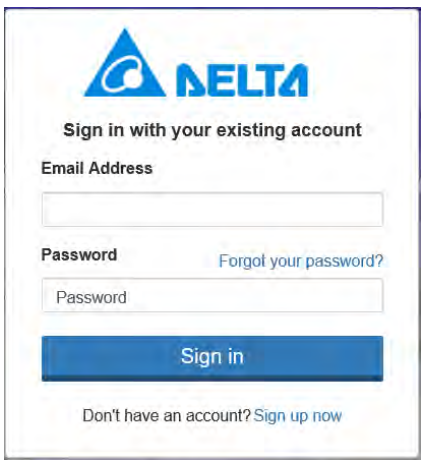
3.2.1 ^- ´*GWƒ

' +pX¬"4!/HU+• •Yh+pX¬ DIADesigner-AX Fk[ˆK~7!6 $ K #ïLâNÆYh<) 2'3·" Fk6ç 5Yh<) • û[ˆK~7!!l-Ù_·
C DIAInstaller Û

DIAInstaller 6 ç . jbIò.v •!]E 7LKˆCí2'6ð#×_¥ IA _V Ý ÛE 2 #Ö Ì' DIAInstaller ñKg5ú8§7Ì ò_d/+pX⁄6Û
5—B•/è Û

)i7ƒ, 7 +pX¬ DIAInstaller •[Þ!/QÚ Ì òO8" ò_d DIAStudio •
https://diastudio.deltaww.com/home/downloads

_Â!L#×_¥+•5 O8JÀ ò_d"4 •RÌ6 K ç; Fb!L[Þ!/E [Þ] #Þ Û



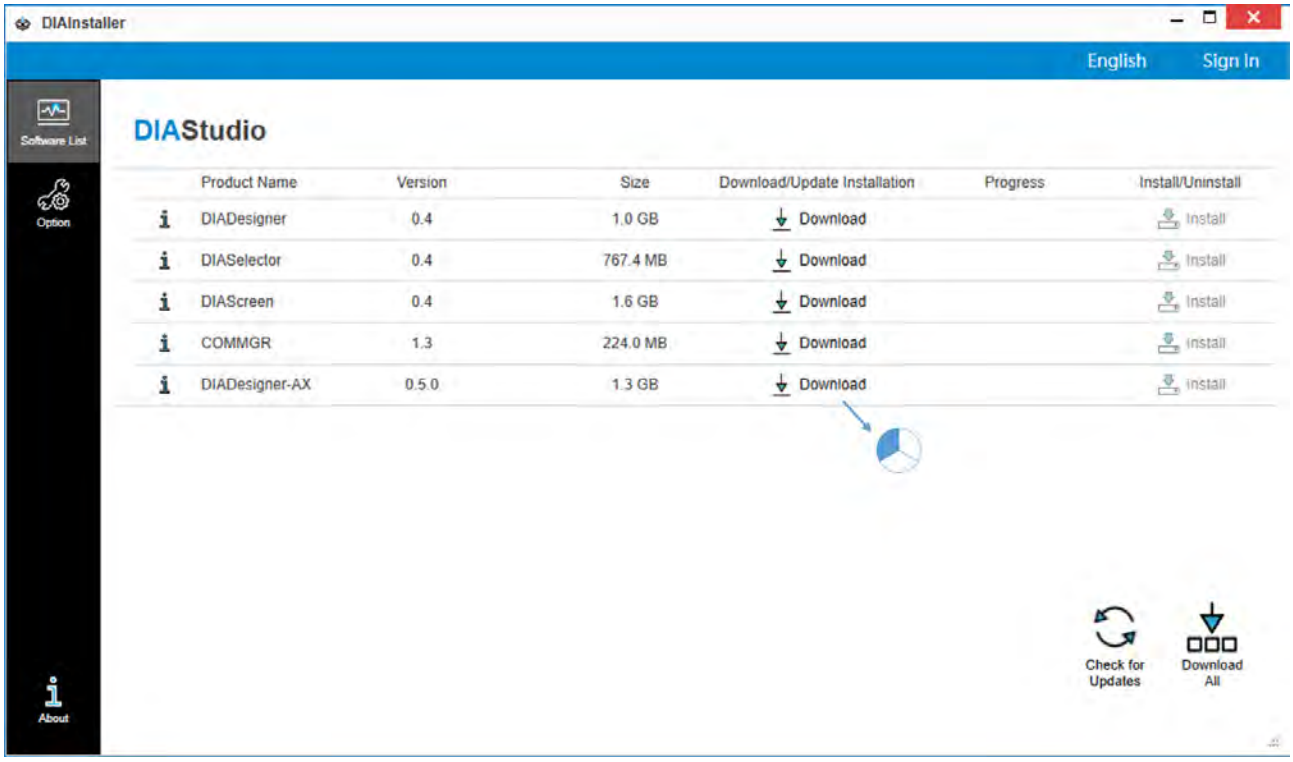
Fb!L#õ#Z#Ö ò_dDIAStudio .]_ÂX3+pX¬

Software

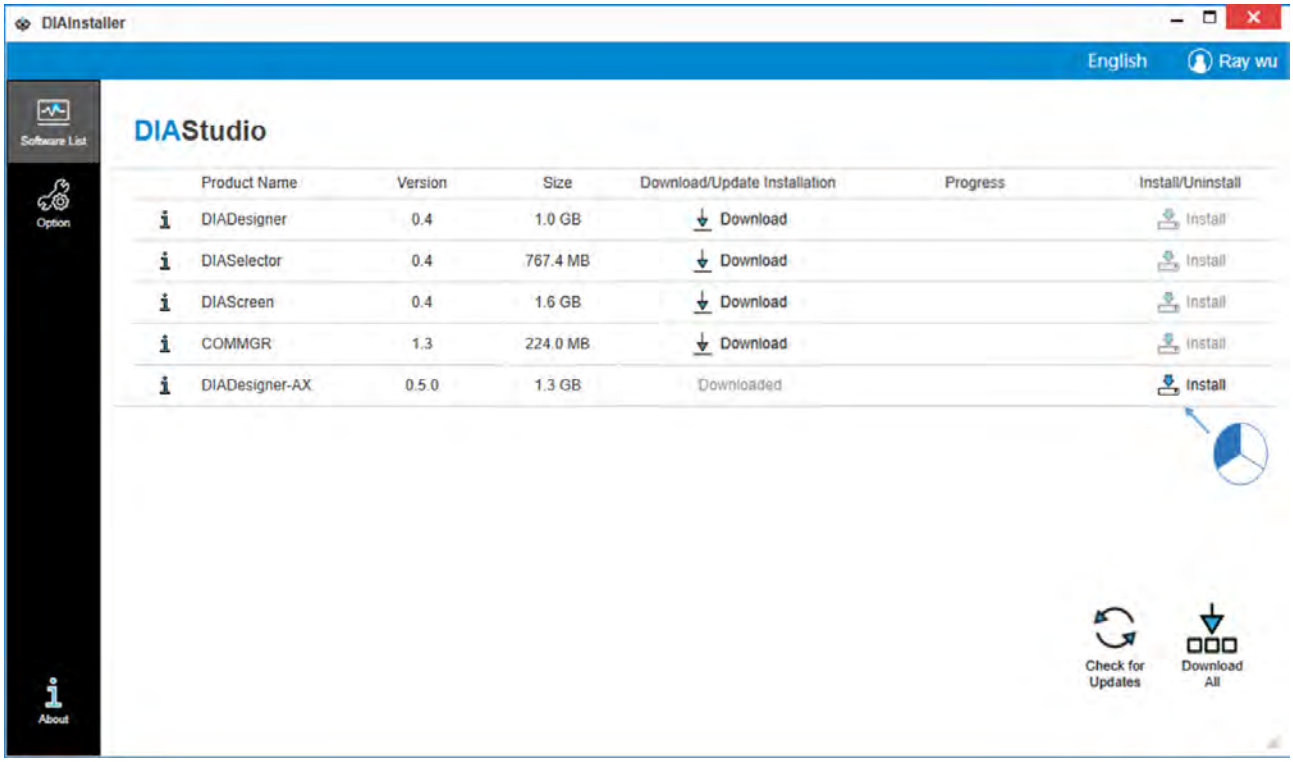
Software Name	Description	OS	Issue Date	File
DIASelector App V0.4 (Early Access!)	DIASelector Mobile App	Android Lollipop (5.0) and above	2020/05/06	
DIAStudio V0.4 (Early Access!)	DIAStudio Software download and Installation Tool	Windows 7 / 8.1 / 10 / Server 2012 R2 32/64 bit	2020/05/06	

RÌ6 ñ_×-Ù+s1÷ •#Z#Ö2ðAN Ì ò;Lj‹.ç)²_ÂX3+pX¬ DIADesigner-AX •

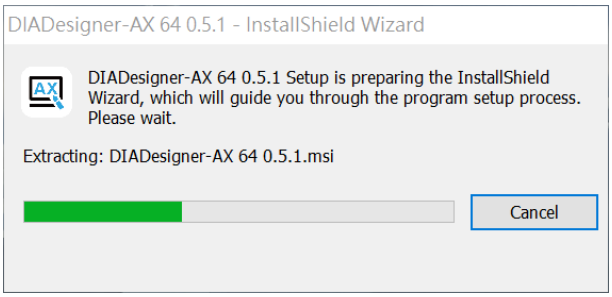
1. 2:.ç DIAInstaller •8§7Ì DIADesigner-AX 6ç5—B/7 Û
2. o 7î#<!â åDownload æ Ì ò_d DIADesigner-AX +pX¬3 •)i ò&å •

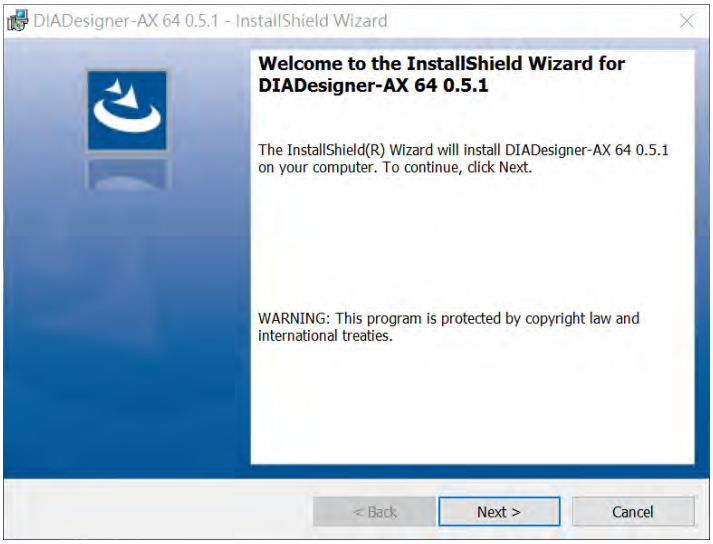


3. ò_d+s1÷#õ •#<!â åInstall æ#Z.ç)²+pX¬_V Ý Û

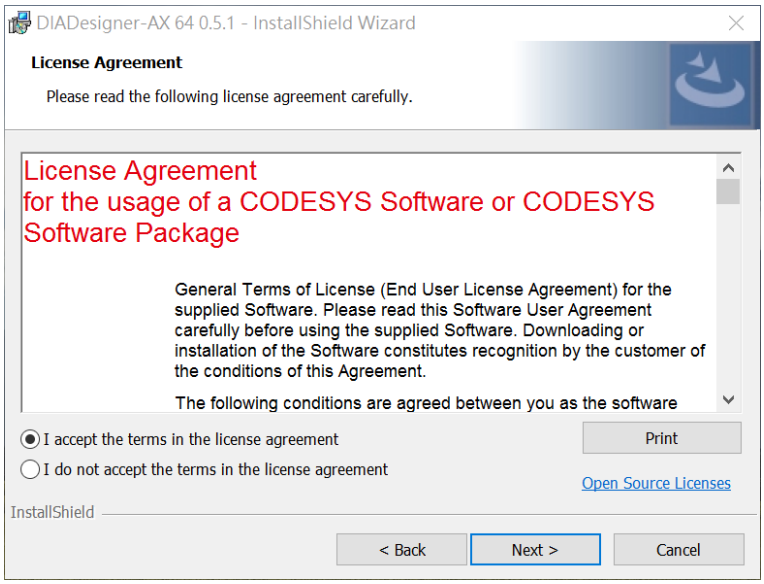


Nº7ƒ •LâNÆ+í.ç)²+pX¬5n Ý.]6%I! InstallShield Wizard J~#Ê •)i ò&å2'I! Û

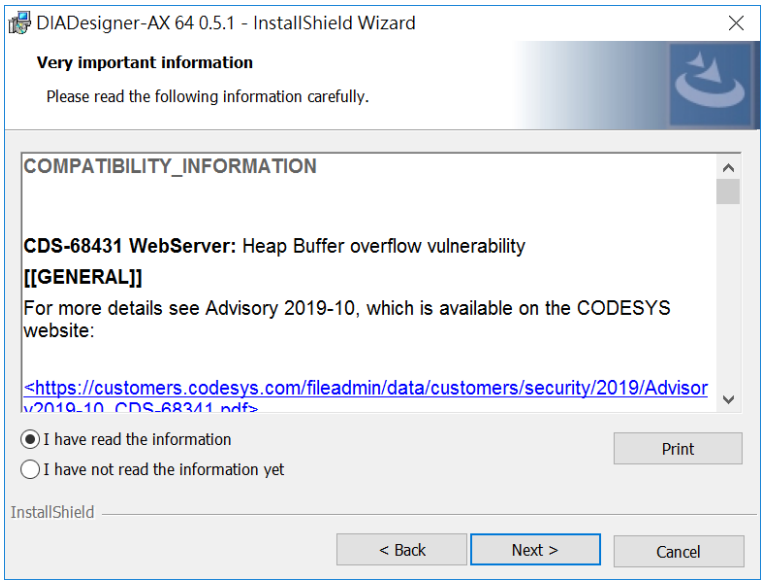




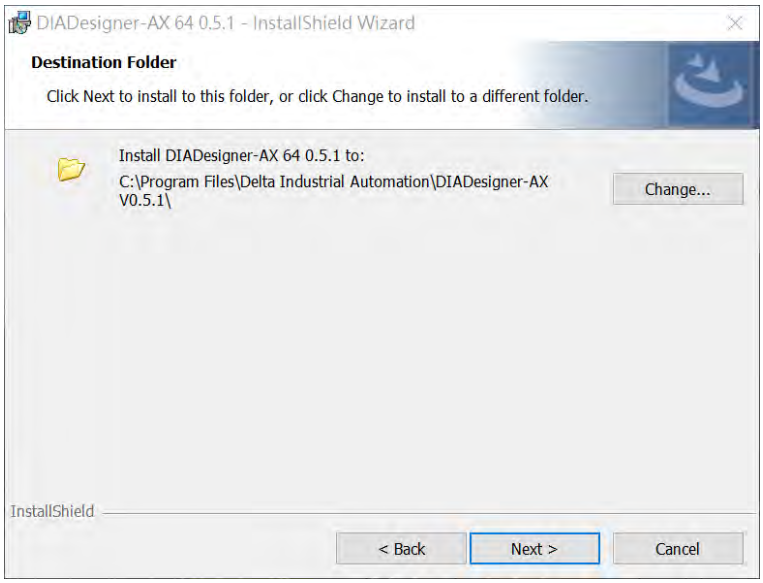
4. #<!ãåNext æ#õ6%I!License Agreement _ðh`J~#Ê •)i ò&å2'I! Û_ð2ÐåI accept the terms in the license agreement æ.] #<!â å Nextæ



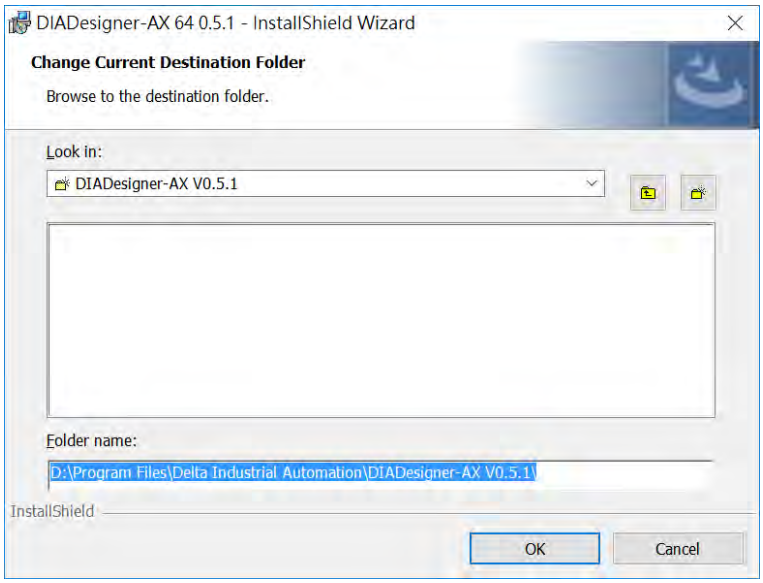
5. 2#õ6%I! Very important information _ðh`J~#Ê •)i ò&å2'I! Û_ð2Ð åI have read the information æ.] #<!â åNextæ



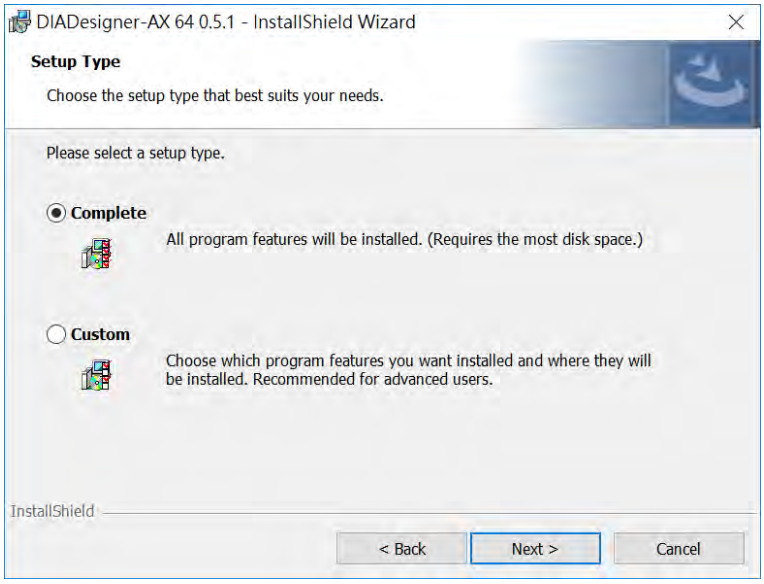
6. 2#õ6%l! Destination Folder _ðh`J~#Ê •)i ò&å2'l! Û)i ô#¿6Ûn¿[‹]Ö/k •!t#<!â åNextêd



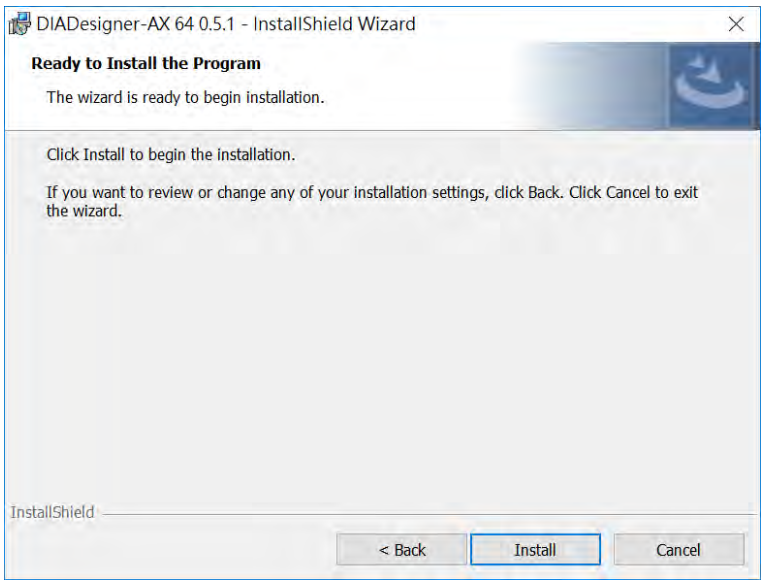
F#Ö Ì#<!â åChange æ#õ_ð2Ð#¿6Û+pX¬FÕ7î5n Ý)]Ö/k Û



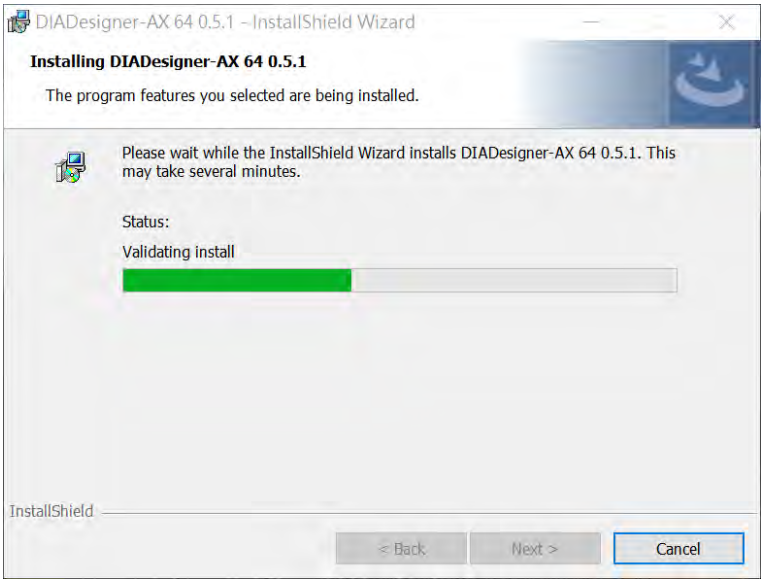
7. 2#õ6%l! Setup Type _ðh`J~#Ê •)i ò&å2'l! Û_ð2Ð+pX¬Lb'r#õ •!t#<!â å Nextêd



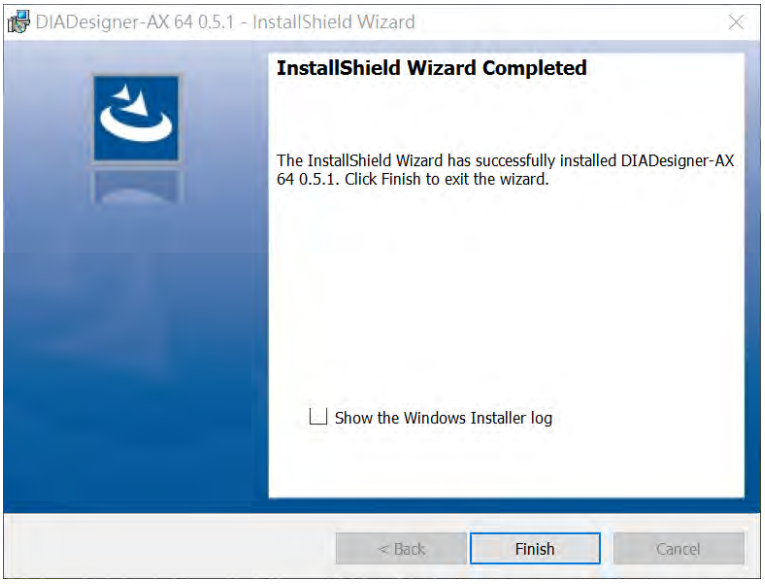
8. 2#õ6%l! Ready to Install the Program _ðh`J~#Ê •)i ò&å2'l! ÛHU+•#õ#<!â åInstall æ#õ.ç)²_ÂX3 Û



_ÂX3+pX¬ •;K(ë hbYhK0/l ç ,5ÝeÛ+s1÷+pX¬ Û



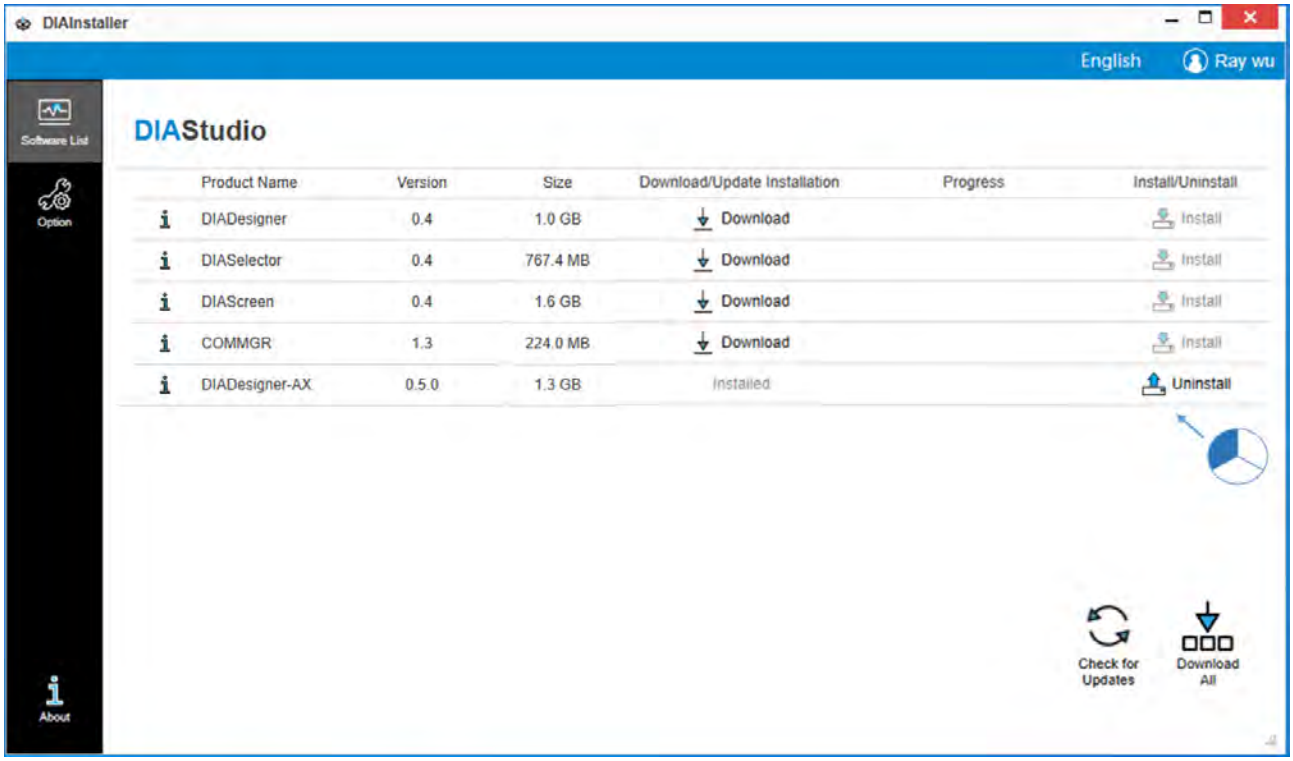
9. +pX¬+s1÷#õ •+í 6%l! InstallShield Wizard Completed J~#Ê •)i ò&å2'I! Û#<!â åFinish æ2ðd•#Z+s1÷ +pX¬ Û



3.2.2 ^- ´"6e"

[Þ2ðAN Ì ò;Lj‹IâfK DIADesigner-AX •

1. 2:.ç DIAInstaller •' FÕ7î_V Ý ñ#<!â å Uninstall æ#__dÛ

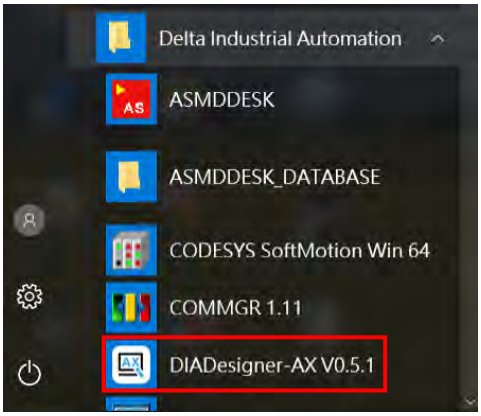


2. #__d=(Iò ' _V Ý#õ#×2NX3 Û
   Nº7ƒ •_V Ý-ÙN¶X'IâfK m Û

3.3 ^- ´>~;ù Ì^ØZm

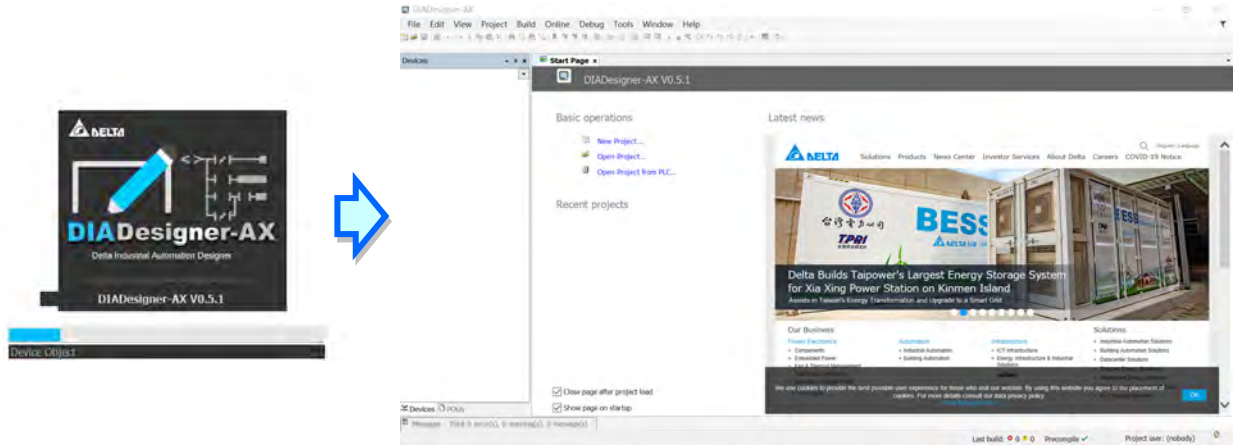
3.3.1 "í!f

1÷"†+pX¬DIADesigner-AX 2#õ •LâNÆ ¦ QÑ"•' 83gI#±Iò.vf- .áJ²/Ò3^5 .ö •#<!â[Ì/Ò3^5 .ö#Z#Ö$ "• DIADesigner-AX Û;K(ý • DIADesigner-AX •5 2è#ó5Ý.ç$) _V ÝJ~#Ê •#ÑYh „3UFß#ó;Lj‹ •#Í(ý!t$ "• DIADesigner-AX #Z#Ö Û



OR

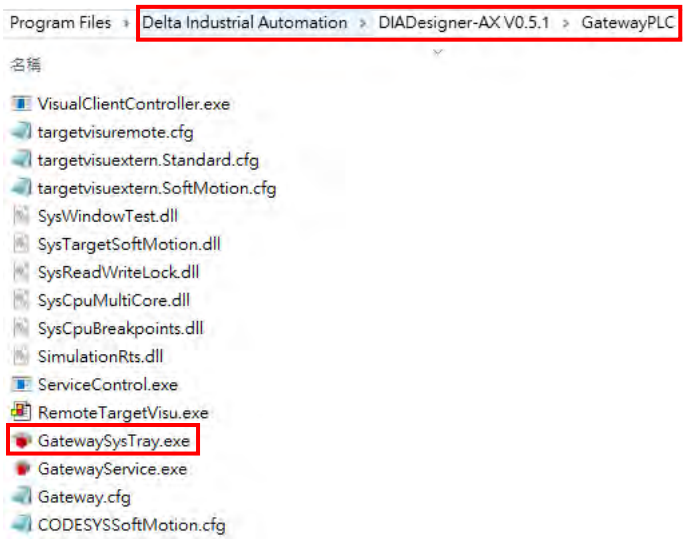
/l; _µE"gIN°7F#õ ¦#Ö;J.ö_Â!L DIADesigner-AX Û

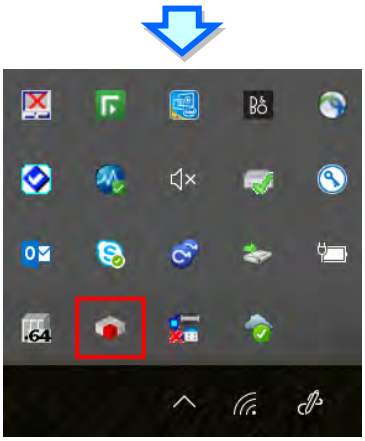


3.3.2 ^ØZm

ha" +s1÷ DIADesigner-AX Fk+pX¬#õ •LâNÆ ¦ QÑ"• uIò.vf-/: .áJ² ç 2NX3/Ò3^5 .ö •FÛ3Œ#<!â[Ì/Ò 3^5 .ö#Z#Ö$ "• Gateway ž 2#õ;¶; [ˆK~7!.ç7! •LâNÆ ¦ QÑ"•$ "• Gateway •.]+í!]. jb' Windows FkLâ NÆ!þ/: ž -RÌLâNÆ!þ <ˆ6ð!áC—[Ì&åI!5Ý •[ÞFÛ3ŒE Iò.vf-/: Fk/Ò3^5 .ö1ý GatewaySysTray Fk2NX35n Ý]Ö/kQÑX3$ "• Û

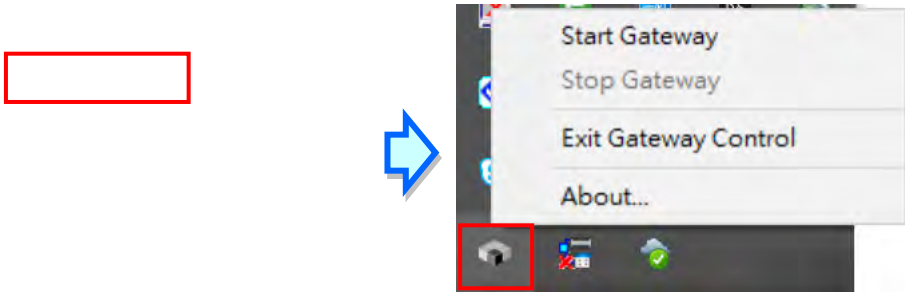
OR





/:ha" $ "• Gateway 2#õ•u Windows FkLâNÆ!þ/: ¦#Ö#¸C—Gateway Fk&å7î •u[Ì&å7î ñ!/ fE o 7î #<!â#õ •#Ö[¥+• ! åStart Gateway æ1ýHU[‹&åI!-Ù !N‰RY#Z Start B•/è Û

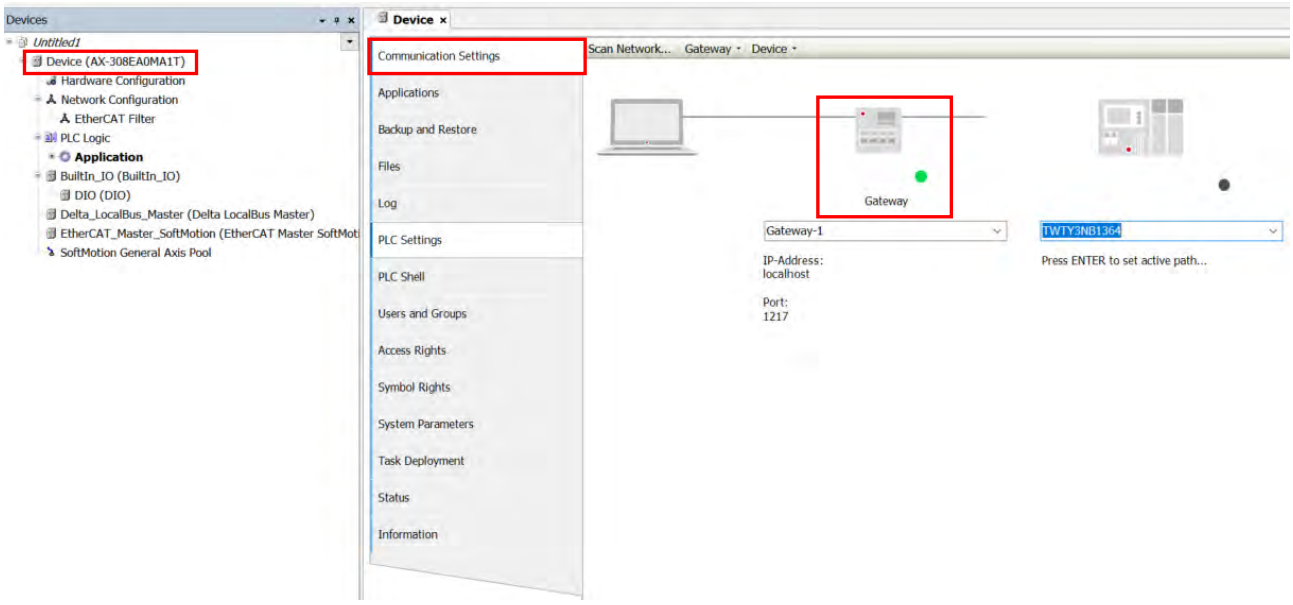
RÌYh C;I Gateway _·X3 • ç8 u[Ì&å7î ñ!/ fE o 7î#<!â_® •!t#<!â ! åStop Gateway æ#õHU[‹&åI!#¿ 6Û !@WRY#ZStop B•/è Û



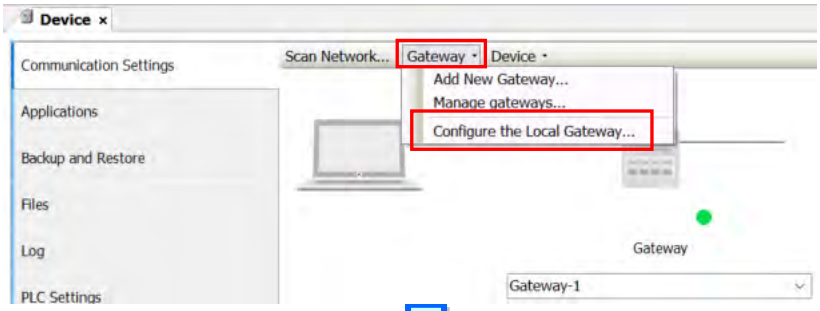
RÌYh+s!O!ZeÔGatewaySysTray 5Ý •[Þ u[Ì&åI! ñ#<!â _®#õ_ð2Ð êxit Gateway Control æ#Z#Ö •[Ì&å7î F J²#Z uLâNÆ!þ IâfK Û

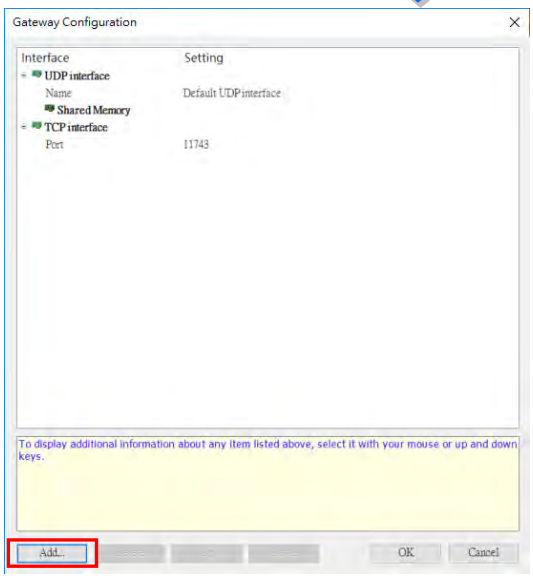
3

[¥+•)d$ "• GatewaySysTray #õ •.ç$ DIADesigner-AX û1÷"†2:.çh`FÕ#õ • u-Í5 [¥(î!þ fE o 7î-Í e #³!â å Deviceæe Device [¥+•Fk!íh\#Z !áC—' "E"gI • û_ð#< 4OU' å Communication Settingsæ Gateway -Ù ! Start B•/è • Gateway 5¨Fk@V#Þ !Næ@V •RÌ Stop B•/è •@V#Þ !N‰@V Û

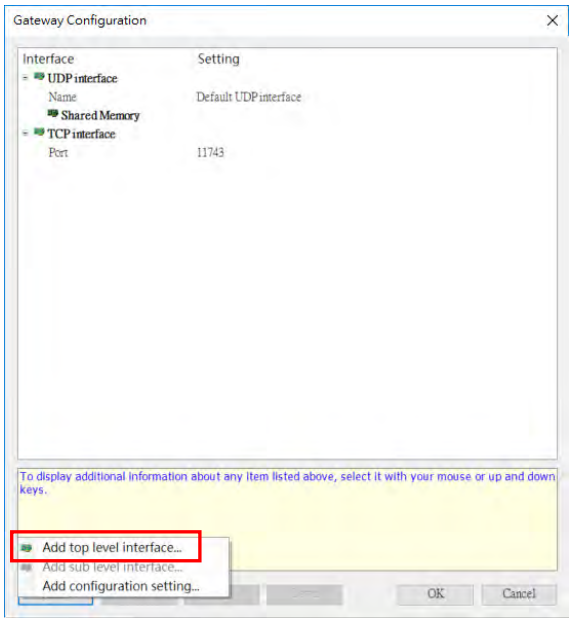


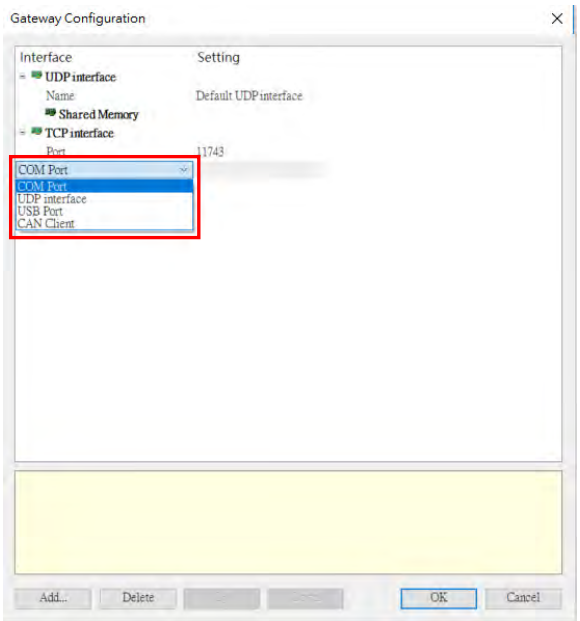
RÌYh[¥+• Local Gateway • fE o 7î-Íe #<!â Device !íh\ ñ5 _ðh` å Gateway æ#õ •#Ö µ ò2°.ö_ð#< _ð 2Ð åConfigure the Local Gateway… æ•#Z]Ú!á[¥+•J~#Ê Û



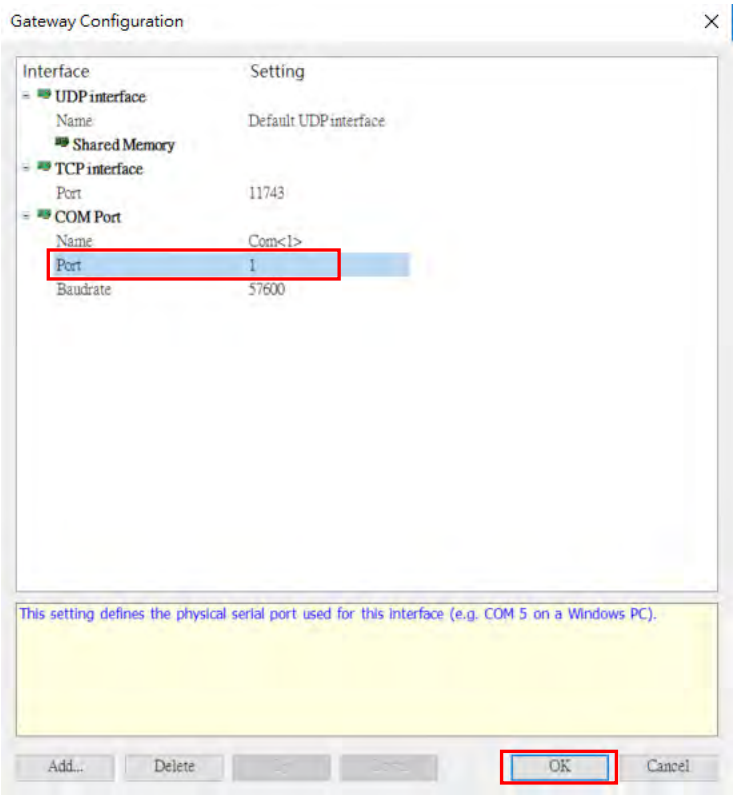


RÌP;7!hbYh fE COM port#Ö uJ~#Ê-Í òY¹#<!âåd Add… æõ µ_ð#< _ð2ÐåAdd top level interface…æ !t µ ñ5 !áC—Fk ò2°.ö_ð#< _ð2Ð å COM Portê

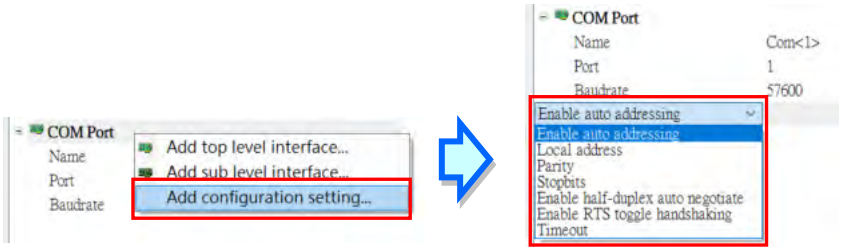




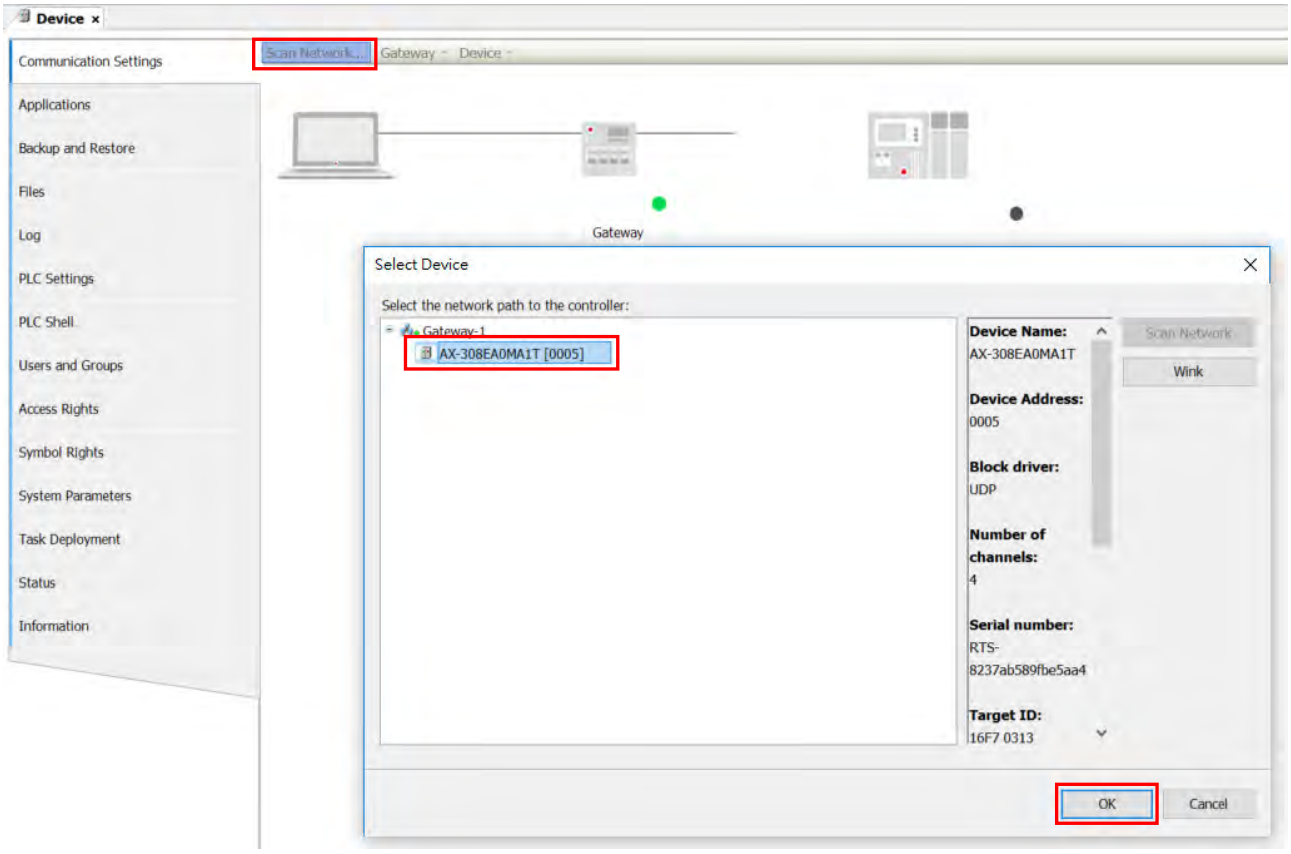
' COM Port òFk#©5W [¥+•)d+à.{Fk Port #Z#Ö •HU[‹#õ!t2ð ò#Ú òY¹2ðd• å OK æÛ' 5—(…#õ • GatewaySysTray hbYh[¥+• Stop/Start ç; •#õNÔ Scan Network 24 ;J. "• C Û



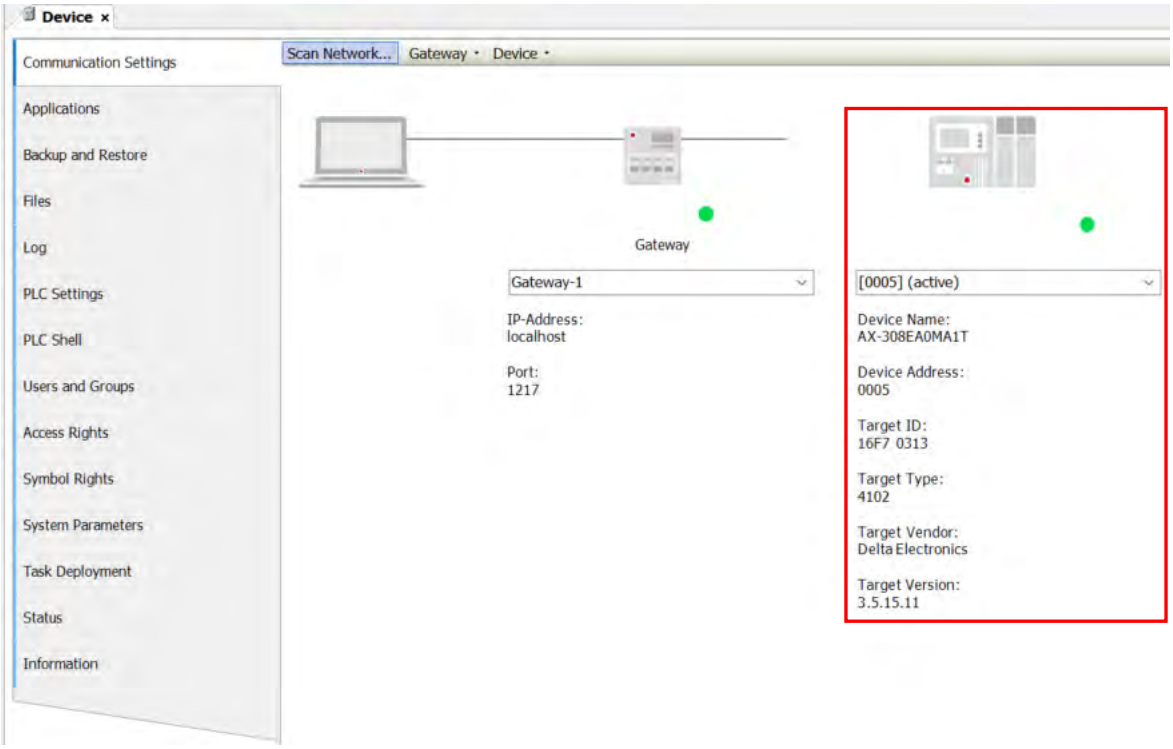
RÌYh' COM Port ò(…"‡#Ö Ì[¥+•Fk#©5W •#Ö' Interface ò&åI! COM Port fE o 7î#Úe #<!â #õ •!t µ_ð#< _ð2Ð åAdd configuration setting… æ•#Z#Ö' ò2°.ö_ð#< _ð2Ð5—(…Yh(…"‡Fkh`FÕ Û



[¥+•)d Local Gateway #õ •fE o 7î-Íe #<!â Device !íh\ ñ5 _ðh`åScan Network… æ#Z]Ú!á åSelect Device æJ~#Ê •!t #<!âYhP;7!Fk[¥(î åAX -308EA0MA1T æ•HU[‹#õ!t2ð ò#Ú òY¹2ðd• åOK æ



+s1÷)d ñ_×"• C#õ •RÌ1÷"†P;7! • Device h\gI!lFk[¥(î#Ú òY¹@V#Þ 6%I!Næ@V • û[¥(îFkFß!Z!l+ 6%I! ' [¥(îFk&å7î ò5 Û



MEMO

4

lê 4 lž &¸5ê3‹

E¬.

4.1 DIADesigner -AX _V Ý4´ C 4-3

4.1.1 .áJ²h`FÕ 4-3

4.2 Device h\gI ²N´ 4-5

4.2.1 "7!#©5W[¥+•.....4-5

4.2.1.1 Communication Settings 4-5

4.2.1.2 Applications 4-8

4.2.1.3 Backup and Restore 4-9

4.2.1.4 Files 4- 10

4.2.1.5 Log 4- 10

4.2.1.6 PLC Settings 4- 12

4.2.1.7 PLC Shell 4- 13

4.2.1.8 Users and Groups 4- 14

4.2.1.9 Access Rights 4- 17

4.2.1.10 Symbol Rights 4- 23

4.2.1.11 System Setting 4- 25

4.2.1.12 System Parameters 4- 26

4.2.1.13 Task Deployment 4- 27

4.2.1.14 Status 4- 28

4.2.1.15 Information 4- 28

4.2.2 2P,<: '>#©5W[¥+• 4- 29

4.3 5W3ULb'r õ#¿a¶.....4- 30

4.3.1 5W3ULb'r.....4- 30

4.3.2 #¿5W.....4- 31

4.3.2.1 #¿a¶+Š$1.....4- 31

4.3.2.2 +â'' 4- 32

4.3.2.3 #¿a¶Lb'r 4- 33

4.3.2.4 QÑ+• 05W3ULb'r.....4- 37

4.3.2.5 #¿a¶=ìfK !fÝ5Ý7![Û5õ 4- 40

4.4 3Ž" &O#†Cí.....4- 41

4.4.1 -Ì C ‹Task Œ.....4- 41

4.4.1.1 -Ì C ‹Task ŒLb'r 4- 41
4.4.1.2) -Ì C ‹Task Œ2NX3..... 4- 42
4.4.1.3 Watchdog 4- 43
4.4.1.4 ;¶I´ â"ˆLb'r#Ö Ì2NX3Fk_·"•3Ž" 2î Ë 4- 43

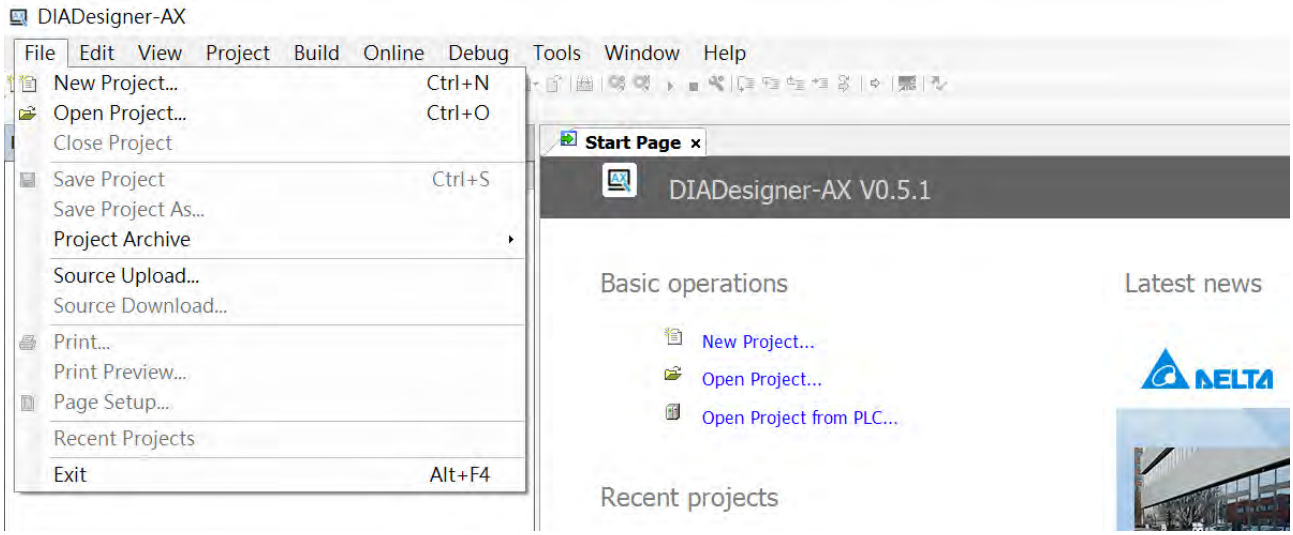
4.1 DIADesigner -AX ^- ´3‹

DIADesigner-AX 6 #ÖNýlò`"_x3Ž" PLC Fk.ç#¸C–(j û6 5[QÑ"•"ý.ç#¸.Z#×Fk8 /ª •+j ! IEC61131-3 2'+• 0FkNýlò[ÔYç3· , m ç Kg#<Fk5 <¼ •LâNÆNý_x&OFk"†Pä6 .áJ² j¿NŽNýlò[ÔYçFk'áH' ñ •"†Pä/!) •5ú u.ç#¸ •#ÖgG0 j¿ •.ç5%0)d.] ûf-1÷ m PLC Ú#ÖY-"ý Ú_·"•3Ž" #±+p!OFkN« Ý Û

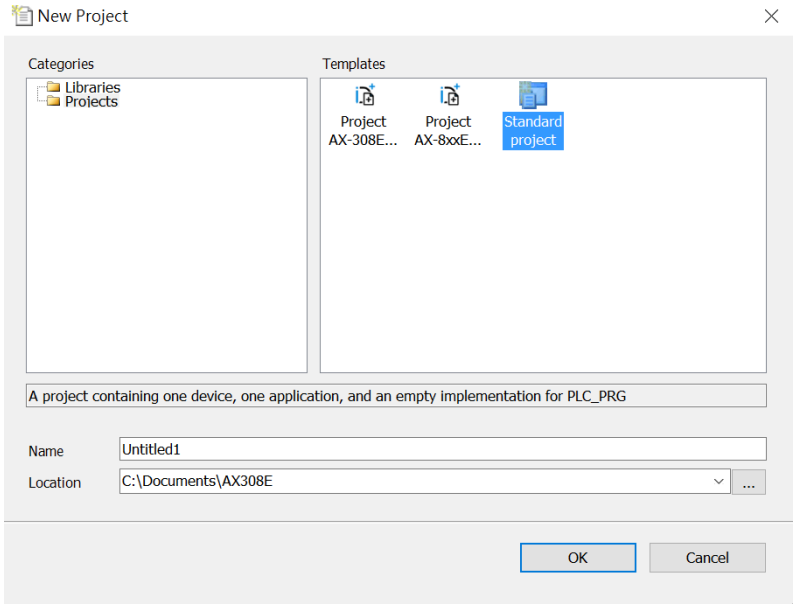
' DIADesigner-AX •2'6ðFkJ~#Ê`ä ô6 &á+•Fk •E 2 #Ö Ì8 3UQÑ-ØFk G0Ö+í!]` _®o 7î2½6ÚFk5 .öIâ "•" FÕ7î 4OU •+íJ~#Ê_ÂX3a´5—3y!þ Û

4.1.1 -¸I‰g7E¬

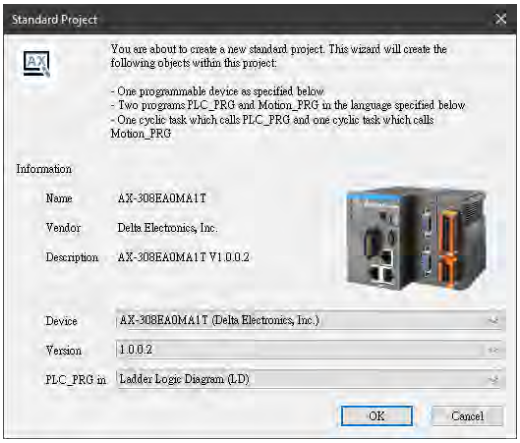
#³!â83gINýlò_V Ý&å7î •$ "• DIADesigner-AX #õ •' -Ì!^7ö #<!â åFile æ > å New Project æ1ýFÛ 3Œ#<!â &å7î ž1ý' å Start Page æ!íh\!!#<!â &å7î5¨ å New Project..æd



3ŒG" 5—h`FÕ.áJ²J~#Ê _ð2Ð7î!-h`FÕ •.] !h`FÕ „.v _z!L å Name æ#± å Location æ•+s1÷#õ2ð ò åOKæd



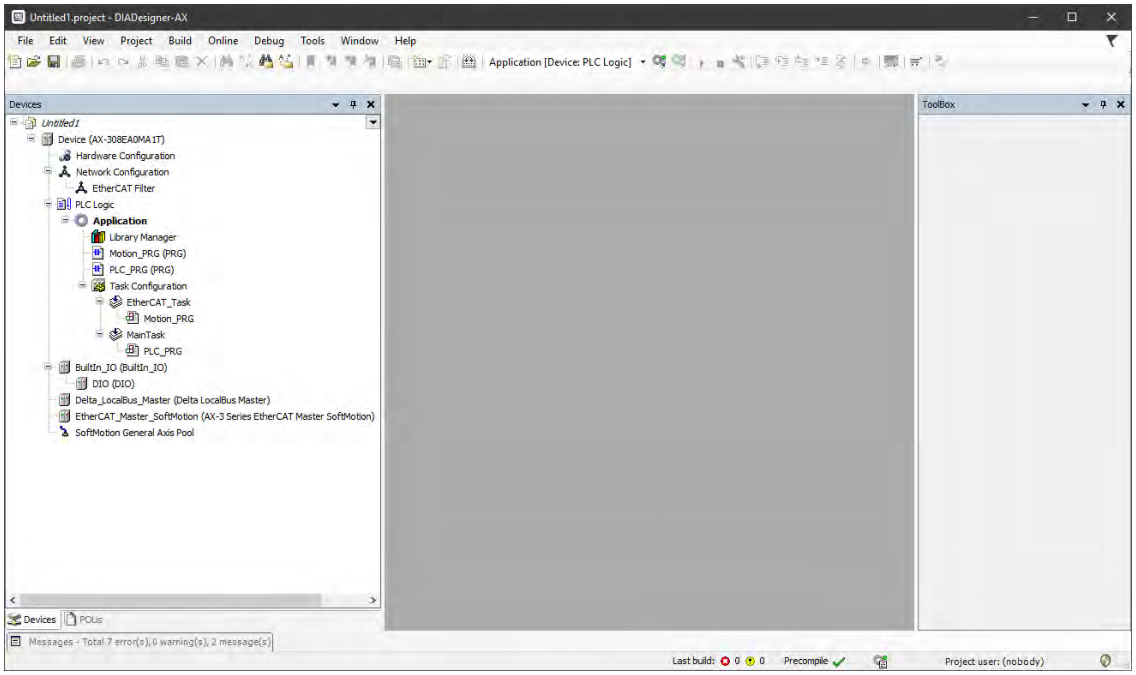
5—.á7î!-h`FÕ6ç#õ8 3U+à[Ä8-3·I! •_ð2Ð åDevice æ#± åPLC_PRG in æ+s1÷#õ2ð ò å OK æLâNÆ QÑ"• E 1÷ ç n¿[‹ !$O7 /'C–'rFk â"^ • â"^ "ì$ ç n¿[‹FkIò.v PLC_PRG Û

DIADesigner-AX B/7 V1.0.0	DIADesigner-AX B/7 V1.1.0 Ì ñ
	

4

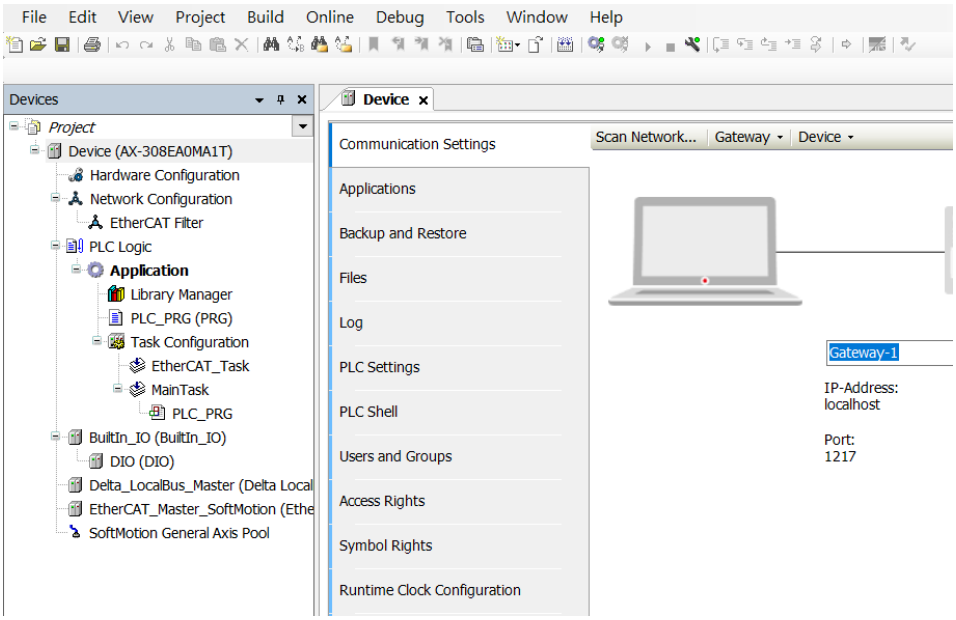
ô#óNýIò[ÔYç#Ö ò2°#õ_ð2Ð Û

1÷"†.áJ²h`FÕ#õ •E"gIFk-Í Ž ¦ .ç$ ç h`FÕKˆCí#! •.] Ì7ø/I&åFk5 .ö!þ!á2'6ð+à\H žRÌ7 !áC—[Ì#! 'Æ5Ý •[Þ' -Ì!^7ö #<!â å View æ > åDevices ‹Alt+0 Œæ#Z#Ö Û



4.2 Device g3f ‰M‹

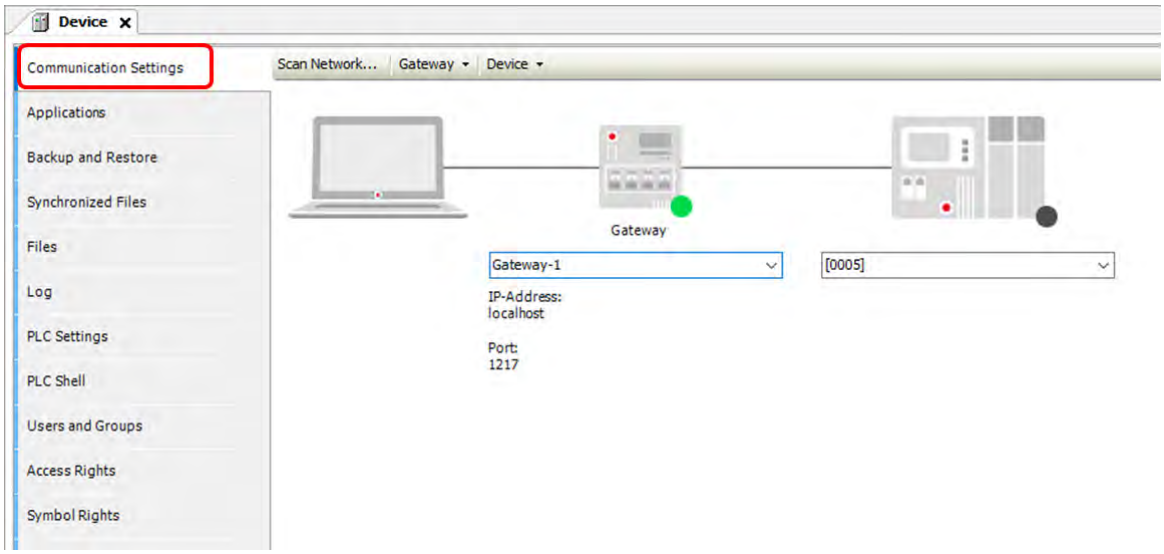
7 JÇRi+í+à Device !l2'6ðh\gl"†Pä • " _ÂX3 ²N´ Û



4.2.1 ù5ø"€4.Z|*X

4.2.1.1 Communication Settings

' åCommunication Settings æh\gI •#Ö ÌQÑX3+• 0 DIADesigner-AX õ3Ž" &O 2eÛFk` [–5 .ö •.]#Ö Ì ' ò2°.ö_ð#<!l •ð2Ðågateway æõ2'; _ÅNºFk3Ž" &O Ł 2 #Ö Ì" E å Manage gatewaysæå Manage favorite devices æ7L+àgateway õ3Ž" &O_ÂX3KˆCí • F#Ö ÌFÛ3Œ_z!L3Ž" &OĦ‹ ‹)i • 192.168.1.5 Œ1ý3Ž" &O#ô ‹)i • AX-308EA0MA1T Œ•/:_z!L+s;¼#õ •DIADesigner -AX QÑ"•+â2e gateway O8NÃ!lFk3Ž" &O Û



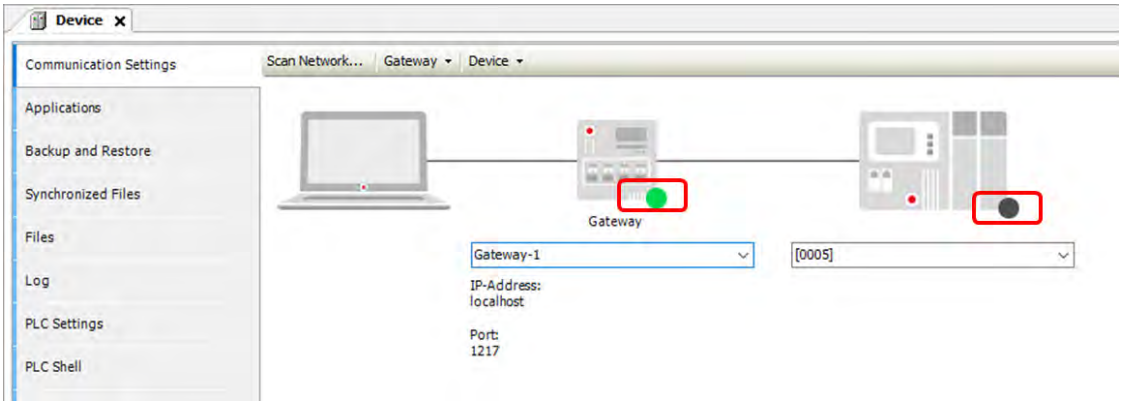
z O 5øAt.¿

Gateway õ3Ž" &O&å7#Ú òY¹Fk&å8/ ÊXO/:"4P;7!B•/è Û

„ N‰RY •5Ç<¼.áJ²P;7! Û

„ NæRY •P;7!-Ù.áJ² Û

„ n¸RY •7 GÌFkP;7!B•/è Û



4

^Ç"	Z²4Ì
Scan network	E 2 #Ö Ì` _®;K_ð#<.ç$ å Select Device æ+à[Ä8- •_Àa³!þ!á2'6ð[¥+•Fk gateway õ!]Fß!ZP;Fk3Ž" &O •E 2 #Ö Ì` _® =ì#<_ð2Ð3Ž" &O Û
Gateway	_ð#<"ì$ m ò!þ"†Päe • z Add New Gateway•ç$ Gateway +à[Ä8- •#Ö' ;K+• 05—Fk gateway ` `: Û z Manage Gateways •.ç$ å Manage Gateways æ +à[Ä8- •;K+à[Ä8-!l !þ!á2'6ð gateway •E 2 #Ö' ;K_ÂX3gateway .é"• Û z Configure the Local Gateway •.ç$ å Gateway Configuration æ +à[Ä8-. E 2 #Ö Ì' ;K[¥+• gateway FkjX"• Û
Device	;K_ð#<"ì$ m ò!þ "†Päe • 1. Options • z Add Current Device to Favorites ‹…"‡/:"42'_ð2ÐFk3Ž" &OQÚåfavorite device æ=ì#< Û z Manage Favorite Devices •ç$. E 3Ž" &O=ì#< •E 2 #Ö Ì' ;K_ÂX3=ì #<.é"• Û‹6ç ñ,)Fk3Ž" &O !n¿[‹3Ž" &O Œ z Filter Network Scans by Target ID • • ¬6%I! õh`FÕ[¥+•Fß#ó target ID Fk3Ž" &O Û z Confirmed Online Mode • •DIADesigner -AX uP;7!: .ö5Ý_ÂX3 ò!þ4´ C"• C6%I!HU[‹J~#Ê Û „ Force values „ Write values „ Multiple loading „ Remove force list

^Ç"	Z²4Ì
	„ Single cycle „ Start „ Stop z Store Communication Settings in Project • •DIADesigner -AX +í` È[¥OU •+?' h`FÕ • -)i7ƒ fE ô#ó[ˆK~7! .ç$;Kh`FÕ5Ý •" /¬hba´5—[¥+• Û •DIADesigner -AX +í` È[¥OU •+?' [ˆK~7!2'+pX¬Fk' " • Ì ¦a´ (ô fE Fß#óFk` È[¥OU Û 2. Rename Active Device •.ç$ Change Device Name +à[Ä8- Û 3. Send Echo Service •;K"†Päe 6 E u=2[¼ DIADesigner-AX õ3Ž" &O 2eÛ FkO8NÃP;7! •DIADesigner-AX #¸!áLb #O8NÃ Ping "†PäFkO8NÃ2Œ5n •!í " _è!á { <ˆ6ð5W3UFk2Œ5n õ { 6ç) 5W3Uef.•Fk2Œ5n •.]6%I!;¶; #¸_è Fk$´.{5ÝeÛ õ.Z'.$´.{5ÝeÛ u5—Fk+à[Ä8- Û 4. Encrypted Communication • $ "•"‡+-` [– /:_ÂX3 login 5Ý" fçYh_ÂX3[‹[¨ •)i3Ž" &O[‹[¨ ô+?' • " 6%I!e [Ö È0V 3·I!6 $ +pX¬1ý6 6%I![‹[¨ • å/ Security Screen æ å Enforce Encrypted Communication æX'_ð2Ð •' ;K"†Päe #ZfwU¶ Û 5. Change Communication Policy •.ç$ å Change Communication Policy æ +à[Ä8- •E 2 #Ö' ;K+à[Ä8-+à3Ž" &OFk"‡+-` [–Fk"• C_ÂX3[¥+• Û

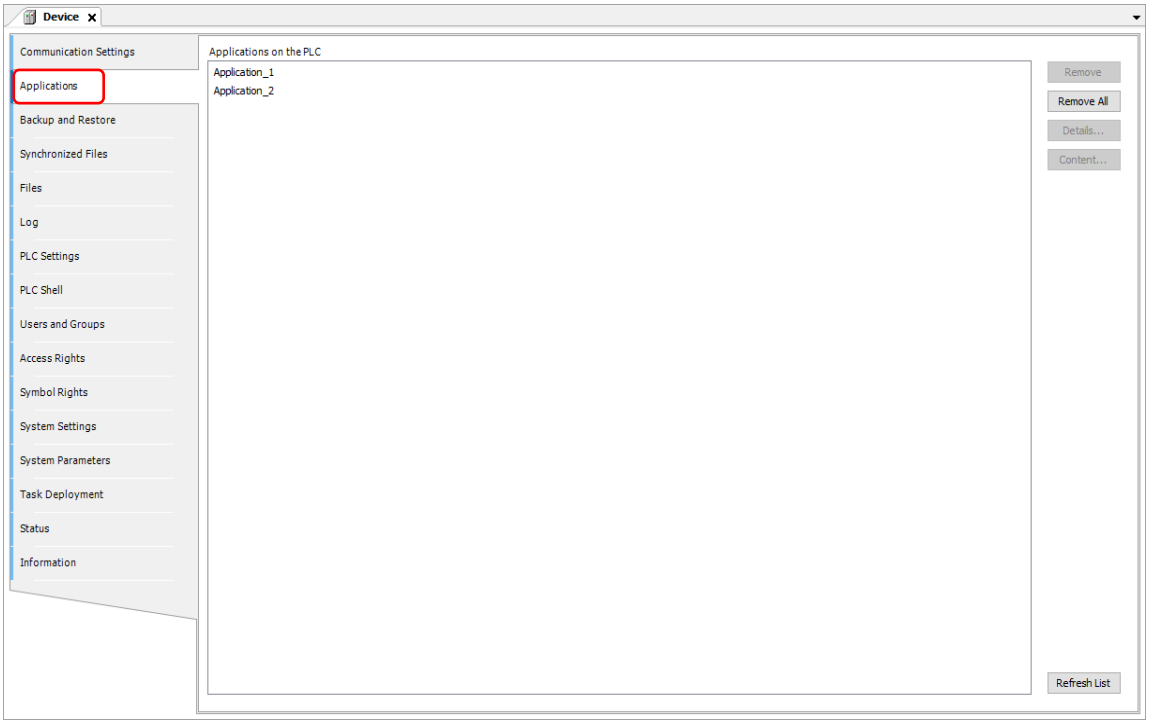
z Change Communication Policy *·Z›7

/: communication policy [¥+•#¿6Û#õ •" _Å#ó3Ž" &O!lFk[¥+• ç]^5 #¿ Û .

Communication	
Current policy	6%I!/:"42'_ð2Ð` [–"‡+- policy Û
New policy	z No encryption • ô fE "‡+-` [– Û z Optional encryption •#Ö_ð2Ð"‡+- õgE"‡+-` [– Û z Enforced encryption • fE "‡+-` [– Û
Device User Management	
Current policy	6%I!/:"4E 2 2'[¥+•Fk policy Û
New policy	z Optional user management •E 2 #ÖQÑX3!š+•6 $ $ "•"‡+-` [– Û z Enforced user management •E 2 /¬hb fE "‡+-` [– Û

4.2.1.2 Applications

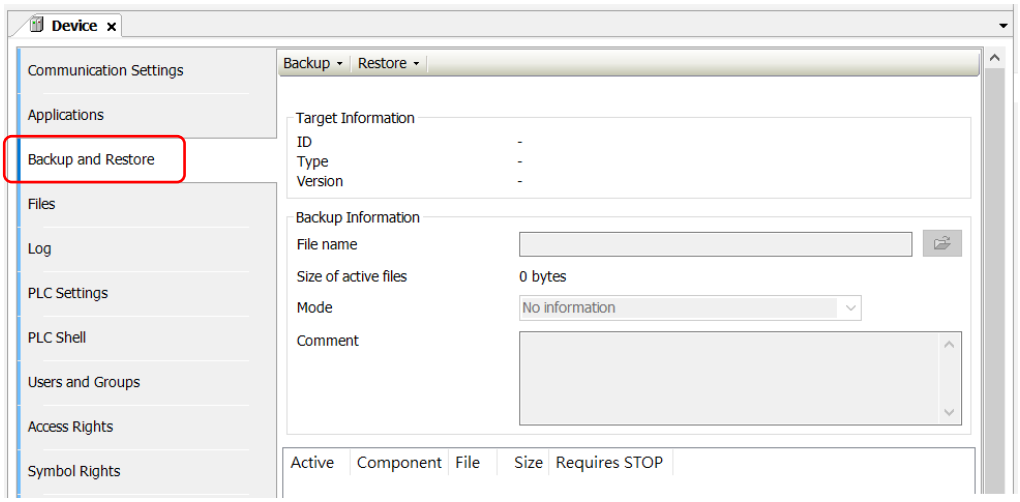
E 2 #Ö Ì` _® å applications æh\gI •HU[‹/:"43Ž" &O!lFk applications •E 2 #Ö2NX3" fKapplications 1ý 6 HU[‹ applications Fß!Z È0VK0"• C… Û



!]O»cì	Z²4Ì
Remove / Remove ALL	Delete •" fK2'/:"4_ð2ÐFk application Delete ALL •" fK/:"43Ž" &O!l2'6ðFk applications
Details	.ç$ Details +à[Ä8- •;K+à[Ä8-6%l! m application !] Information h\gI2'[¥+•Fk,E 0 •)i Author ÚVersion õ Descriptions… Û
Contents	.ç$ Contents +à[Ä8- •;K+à[Ä8-6%l! m3Ž" &O õFÕ"4h`FÕ6ç#õNý[¸Fk!l+ Û <Ï •fç!/+í application BP ÝFkDownload the applications "å_ð Û ‹!]]Ö/k ! application > properties > Application generation options Œ
Refresh List	6Û5—/:"43Ž" &O!lFkapplications !þXO

4.2.1.3 Backup and Restore

' Backup and Restore h\gl E 2 #Ö Ì` _® •+? õ[â#½ zip archive Fk5 .ö+à3Ž" &OFkapplication-specific 5n Ý_ÂX3(î ä õ_¿#† Û



^Ç"	Z²4Ì
Backup	;Kh\gl"ì$ m ò!þ"†Päe • z Read Backup Information from Device •;K"†Päe !þ!á3Ž" &O5n Ý) å PlcLogic æ!lFk2' application-specifix 5n Ý Û z Create Backup File and Save to Disk •;K"†Päe +í2'_ð2ÐFk5n Ý.áJ² 1÷ ç #rO 5n Ý • ,_¿#† fE Û(î ä5n Ý2P,<#ô ! .tbf Œ z Save Backup File to Device •+í(î ä5n Ý •+?QÚ3Ž" &O Û
Restore	z Load Backup File from Disk • µ[^K~7![â#½2' •+?Fk(î ä5n Ý Û z Load Backup File from Device • µ3Ž" &O[â#½2' •+?Fk(î ä5n Ý Û z Restore Backup to Device •+í(î ä5n Ý_¿#†QÚ3Ž" &O Û

z Target Information

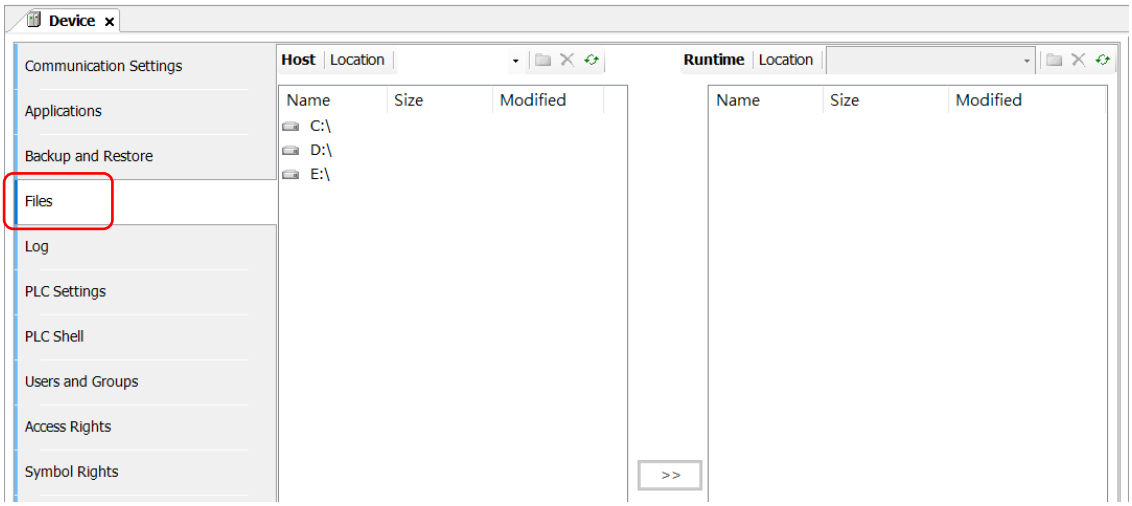
ID	!S#ß ÊGè õ7!l´ ÊGè
Type	7!l´Lb'r
Version	3Ž" &OgÎ :B/7

z Backup Information

File name	(î ä5n ÝFk •+?]Ö/k
Size of active files	(î ä5n Ý) +ö
Mode	(î äRê&Û
Comment	E 2 #Ö Ì' .áJ²(î ä5n Ý5Ý •' ;K_ÂX3(î ä5n Ý<Ïa± •.]' [â#½(î ä5n Ý5Ý[â #½;K È0V •;K È0V Ä+?' meta.info 5n Ý!l Û

4.2.1.4 Files

' Files h\gIE 2 #Ö Ì` _® DIADesigner-AX _ÂX3[ˆK~7! õ3Ž" &O 2eÛFk5n Ý _z Û



Location	LâNÆ/:"4]Ö/k •' ò5 Fk+7FÕ/< 6%I!5n Ý#ô •5n Ý) +ö õ Õ5 5Ì7 Û
	' /:"45n Ý]Ö/k.áJ²5—5n Ý)
	" fK2'_ð2ÐFk5n Ý) 1ý6 5n Ý
	6Û5—/:"45n Ý]Ö/kFk5n Ýõ5n Ý)
	+í5n Ý!€!L3Ž" &O
	+í5n Ý µ3Ž" &O[â!á

4.2.1.5 Log

' Log #^7î •!þ!á m' LâNÆ ñ#¸E Fk r Ý[—/< Û[—/<!l+ "ì$ •

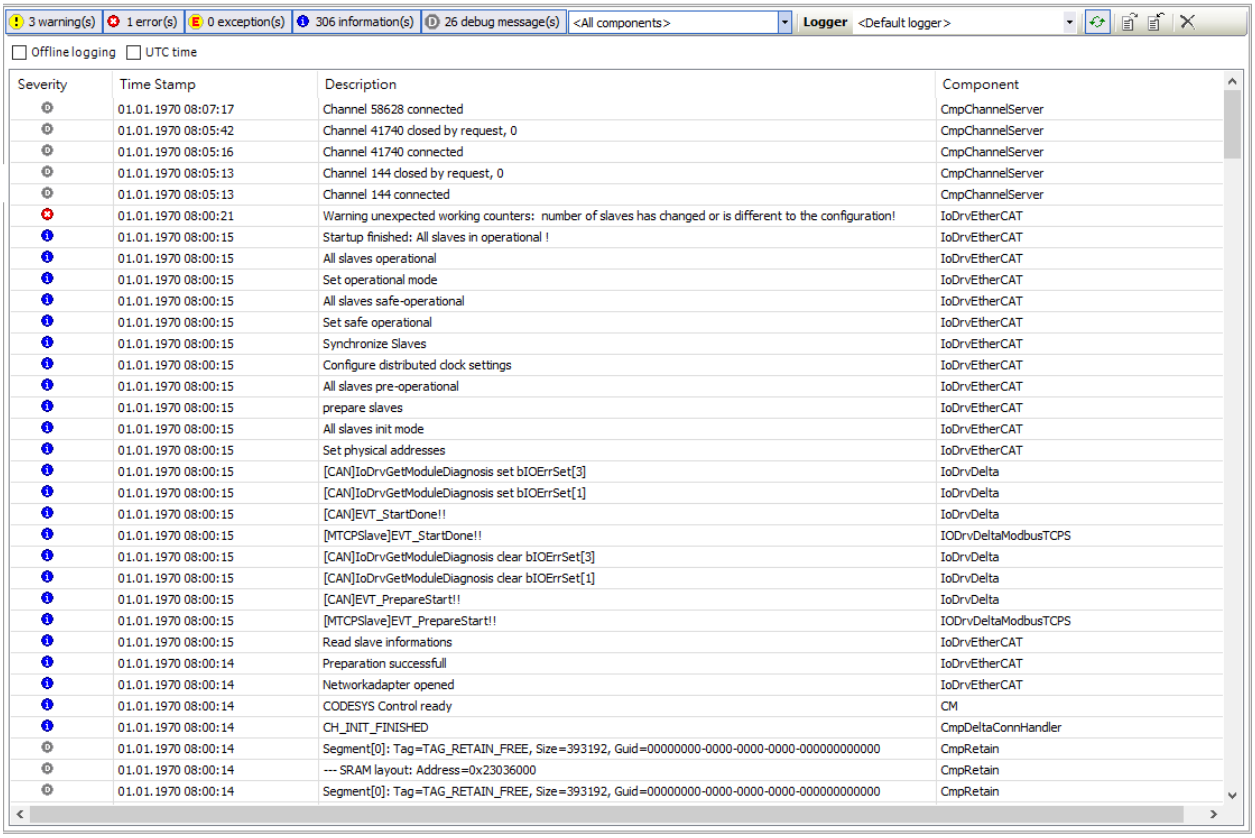
z LâNÆ$ "•" !ZeÔ7 eÛFk r Ý ‹"‡_dFkN« Ý •"ì$ B/7 È0V Œ

z .{E Iò.vFk ò_d#±"‡_d$ "•5ÝFk.{E Iò.v

z QÑ+• 0h`FÕ

z µ I/O jX"•Iò.v ŽE Fk5Ì/¾

z µ5W3U7L>w ŽE Fk5Ì/¾

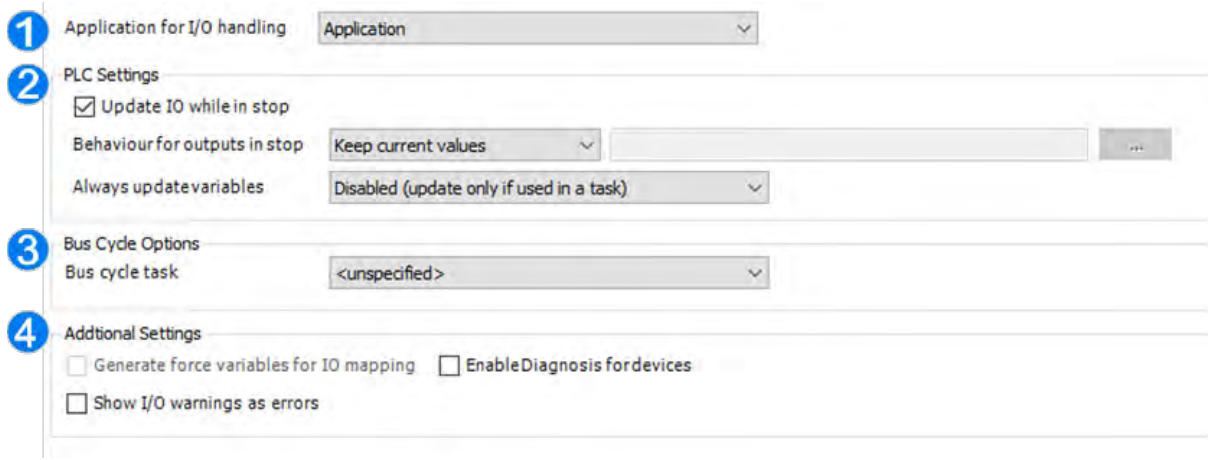


!]O»	Z²4Ì
Offline logging	•n¿[‹ # Û •PLC F[—/< õ AX-3 Lâ!þ3Ž" &O_Å3Œ5Ç!ZFk"• C Û -FÕ"4 ¬do+à CODESYS Fk+p!OB/7 !([Ÿ;Kh`4´ C Û
UTC time	•7î!-[¥OU •5ÝeÛ „AN4´ CLâNÆFk5Ý#!_S3I ![ˆK~7! ñFk7 ' 5ÝeÛ Û •6%I!LâNÆ +…f,_·X3Fk5ÝeÛ Û
Severity	„3U r Ý a´0 !í !&Â Lb" • x •Message ‹ È0V Œ x • Warning ‹[M$1 Œ x •Error ‹e [Ö Œ x •Debugging ‹fKe È0V Œ #Ö Ì "•!þXO ñ5 7ö +à.{Fk2ðd•7L6%I!1ýfwU¶;¶ Lb" ¦¶ 2ðd•6ð6%I! !]Lb" Fk[—/<5W Û
Time stamp	5Ì7 - 5ÝeÛ ‹ r)i • 12-01-2007 09 • 48 Œ
Description	r Ý3¶_×
Component	_·X35Ý •LâNÆFß!ZN« ÝFk#ôI× Û r)i •CmpApp
Drop-down list with component names	5Ì¾!þXO ¬6%I! õ2'_ð2Ð 2N« Ý6ð!ZFk r Ý
Logger	6 ç #Ö Ì ò2°.öFk_ð#< Ûî!-[¥OU !<Default Logger> ŧÕ¼õ stdLogger Fß#ó Û

!]O»	Z²4Ì
	a´5—5[Cí5Ì/¾!þXO
	+í!þXO!l+ +ã!á" XML 5n Ý
	+í XML 5n Ý+ã!L" 5Ì/¾!þXO
	=ìJa6%l!Fk5Ì/¾!þXO

4.2.1.6 PLC Settings

åPLC Settings æ!íh\ •!` E [¥(îFkNý_x •#Ö Ì+à PLC N«/è_ÂX3'á7 [¥OU • r)i •_z!L$s_z!áFk(ëCí #±/'C– â"ˆFk[¥+• Û



z Š Application for I/O handling

^Ç"	Z²4Ì
Application for I/O handling	]] I/O (ëCíFk.{E Iò.v

z › PLC Settings

^Ç"	Z²4Ì
Update IO while in stop	¢ PLC (ë u C;IB•/è5Ý • DIADesigner-AX ô " 5—_z!L$s_z!á` `:Fk # Û ¢ PLC (ë u C;IB•/è5Ý • DIADesigner-AX F " 5—_z!L$s_z!á` `:Fk # Û)i7ƒF¸Y-8§=2" 5,fƒ •" +í_z!á[¥OU !n¿[‹ # Û
Behaviour for outputs in stop	/: AX-3 Lâ!þ3Ž" &O_Â!L C;IB•/è5Ý •_z!á` `:Fk(ëCí • Keep current values • Ä2è/:"4 # Û Set all outputs to default •+í2'6ð I/O 6 ¶'.[¥ !n¿[‹ # Û Execute program •#Ö Ì` _® ;Kh`[¥+• •' DIADesigner-AX ! STOP B•/è 5Ý •2NX3#Ú ŽIò.v Û
Always update variables	!O,'[¥+• •+• 06 $ 6Û5— bus cycle task Fk I/O #¿a¶ Û#Ñ' µJÀ$s: '>Fk6Û 5—[¥+• +• 0 ! åIhE æ5Ý •;K[¥OU24+à µJÀ$s: '>Fk I/O #¿a¶6ð5/ Û

^Ç"	Z²4Ì
Always update variables	Disabled ‹Update only if used in a task Œ•#Ñ' â"^ fE I/O #¿a¶24Pä6Û 5— Û Enabled1 ‹use bus cycle task if not used in any task Œ•)i7ƒ<^6ð' !]+j â < â"^ fE •" 6Û5—' bus cycle task Û Enabled2 ‹always in bus cycle task Œ•5Ç[¡6 $ fE " I/O #¿a¶1ý6 ¶" _z!L1ý_z!á` `: •'. ' bus cycle task Fk;¶ /'C– 6Û5—2'6ðFk#¿a¶ Û

z ŒBus Cycle Options

^Ç"	Z²4Ì
Bus cycle task *1	3Ž" bus cycle Fk â"^ Û' n¿[‹0¬!œ ò •E [¥(î3¶_×Fk+• 0_Â!L â"^$O7 Û

<Ï 1 •+í bus cycle task _ð2Ð[¥+• ! <unspecified> •.{<Ï0ö •"<unspecified>" XOI![¥(î3¶_× NÀFkn¿[‹ #E 5/ Û &Ç;K.{[Ì8§7Ì;K3¶_×8J Û#Ö Ì+í fE 6çGÔ/'C–5ÝeÛFk â"^+• 0 !n¿[‹ # • -6 #ó8 Fk FPä+í6ç. /'C–5Ý eÛFk â"^+• 0 !n¿[‹ # Û

z • Additional Settings

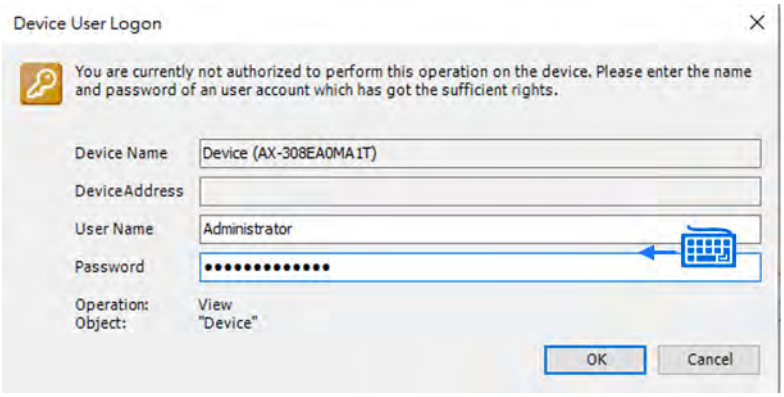
^Ç"	Z²4Ì
Generate Force variables for I/O mapping	[¥(î ô5 2è;K[¥+•
Enable Diagnostics for devices	• DIADesigner-AX QÑ"•+í library CAA [¥(î[±5”5[#ï" h`FÕ •] û.áJ² ç fwU¶.öFk"†Pä'> Ûi7ƒ[¥(î -ÙN¶6ð"†Pä'> ' fE 2P,<"†Pä'>≺ r)i • fE EtherCAT Œ1ý=â"‡ ç "†Pä'>+… r ÛA #õ_À"ì$ [¥(î[±5”Fk çR +…C— Û
Show I/O warnings as errors	6ð!Z I/O a4OUFk[M$16%I! !e [Ö

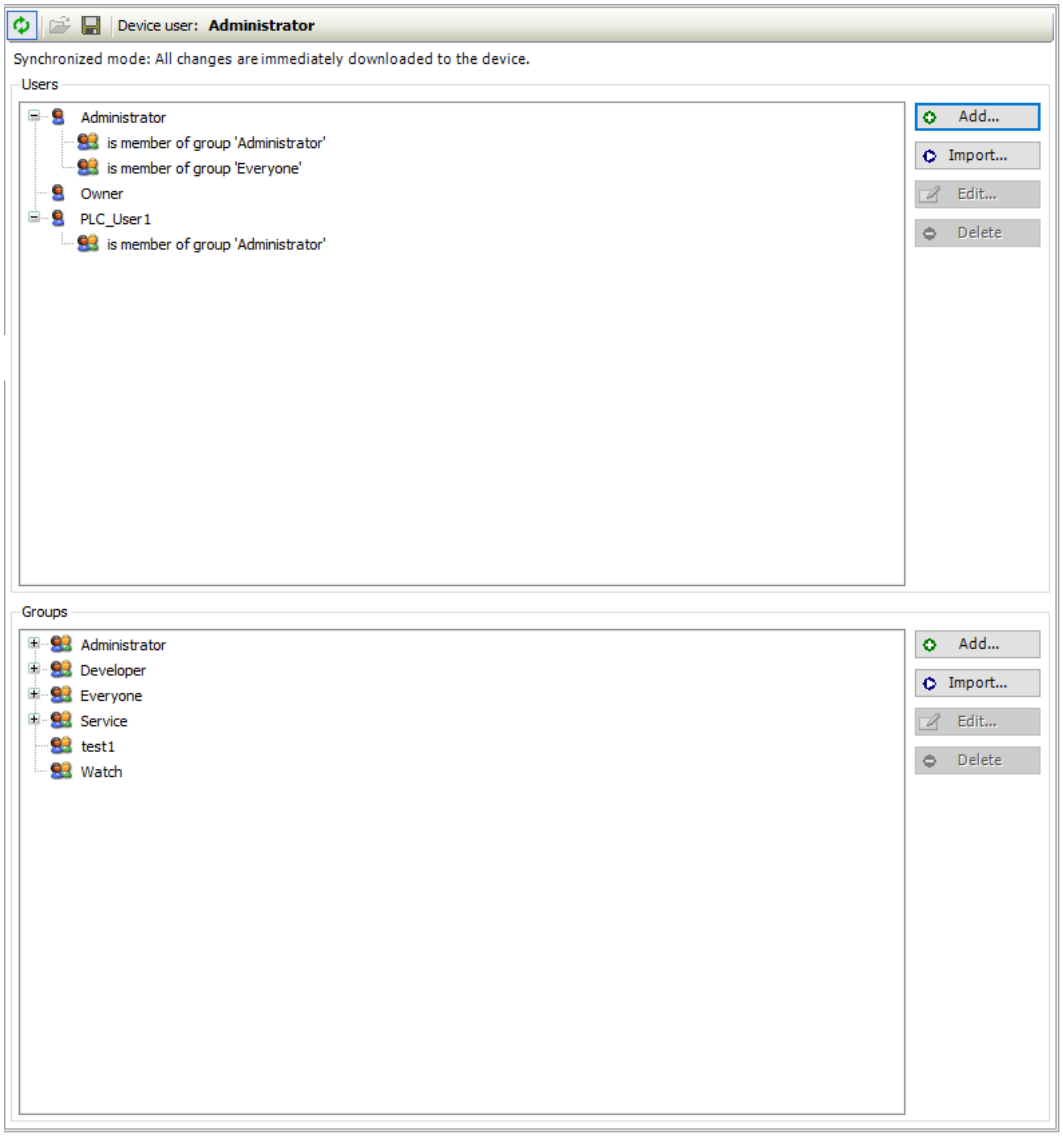
4.2.1.7 PLC Shell

E 2 #Ö Ì' ;Kh\gI •4 a4B`+•Fk$d Ë7L7Ì[É3Ž" &OFß!Z È0V •.]6%I!' ;Kh\gI Û

4.2.1.8 Users and Groups

Ný_xAX-3 Lâ!þ3Ž" &OFkE 2 -÷2 #±O‹N«KˆCí •' _·X3 #Ö Ì3Ž" Fk+à\H#±=6Y¯Fk7*f7[¥+• Ûi}; fE 5Ý • n¿[‹ 2E 2] #Þ Administrator +-GèAdministrator •Fb!L#õ.]_ÂX3+-Gè Õ5 [¥+• Û





z Toolbar of the tab

!]O»cì	Z²4Ì
Synchronization	2:.ç$s!ZeÔ[¥(î ñNý_x&O$sE 2 KˆCíeÛFk#ó;L"†Pä Û 1. 7 2ð ò2ðd• •Ný_x&O !JaFd Û 2. 2ð ò2ðd• •Ný_x&O õFÕ"4_Å3Œ[¥(îFkE 2 _ÂX3#ó;L Û 3. Ný_x&O õ[¥(î ñ 2[¥+• ô#ó5Ý •" 6ð3·I! È0V •_ðh` • Upload from the device and overwrite the editor content •µ[¥(î ñ_d " Ný_x&O •YmF½FÕ"4!l+ Û Download the editor content to the device and overwrite the user management there •+íNý_x&O!l+ ò_dQÚ[¥(î •.].{E +j Û
Import from disk	µ5n Ý +ã!LE 2 KˆCía4OU
Export to disk	+íFÕ"4E 2 KˆCía4OU+ã!á •+?" 5n Ý
Device user	FÕ"4Fb!L[¥(îFkE 2 #ôI×

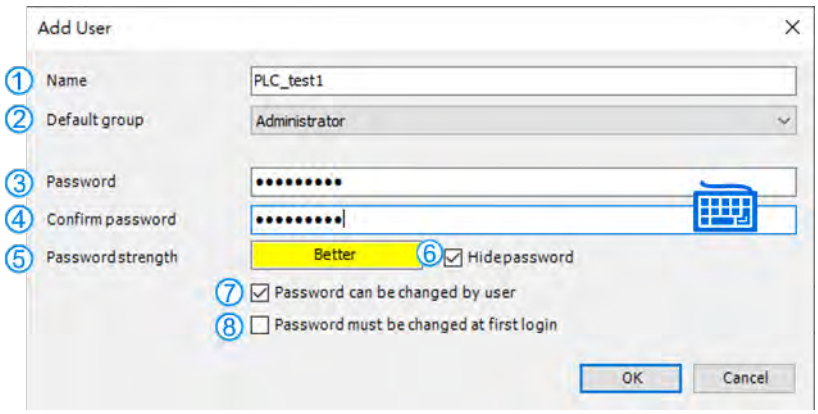
z Users

!]O»cì	Z²4Ì
Add	5—(…E 2<Ï ç
Import	2:.ç Import Users +à[Ä8-+ã!LE 2 *<Ï s
Edit	Ný_x2'_ð2Ð 2E 2 -÷2
Delete	" fK2'_ð2Ð 2E 2 -÷2

z Groups

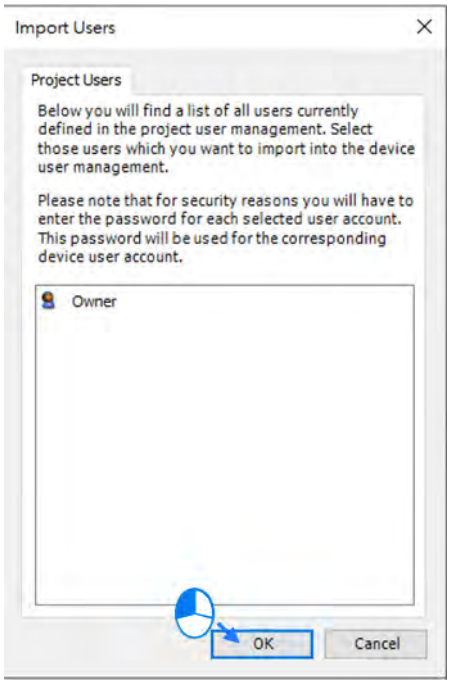
!]O»cì	Z²4Ì
Add	5—(…O‹Ñ«
Import	2:.ç Import Groups +à[Ä8-+ã!LE 2 *<Ï&Â
Edit	Ný_x2'_ð2Ð 2O‹N«
Delete	" fK2'_ð2Ð 2O‹N«

<Ï ç •5—(…E 2 +à[Ä8- åAdd user æ

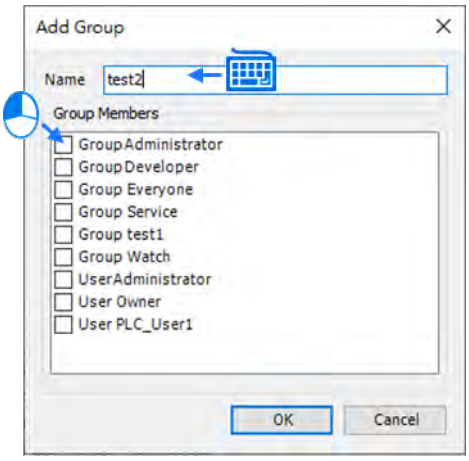


g7E¬	g7E¬	Z²4Ì
š	Name	E 2 #ôI×
›	Default group	_ð2ÐE 2 n¿[‹O‹N« ‹ ò2°.ö_ð#< Œ
œ	Password	+-Gè
•	Confirm password	HU[‹+-Gè
ž	Password strength	+-GèFk+p!O0 Û µVery weak " Very good K0NŽ Û
Ÿ	Hide password	•_z!L+-Gè5Ý • ¬6%I!6 #Þ " • " Û
	Password can be changed by user	•+-Gè!([ŸX' Õ5
¡	Password must be changed at first login	•+-Gè/¬hb' K ç; Fb!L5ÝX' Õ5 #¿6Û

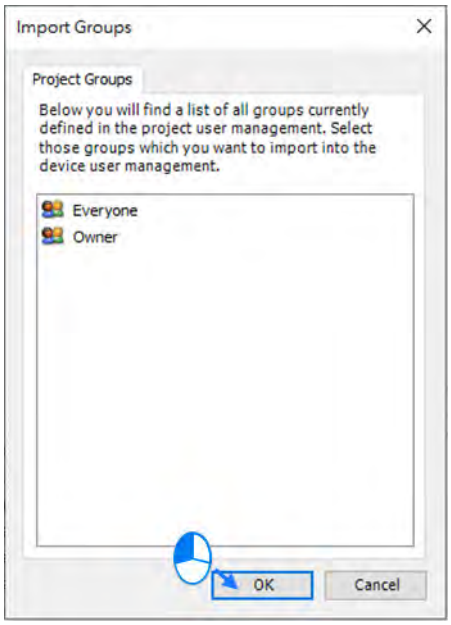
<Ï s •åImport Users æ+à[Ä8- •_ð2Ð#õ •2ð åOKâê



<Ï ð •åAdd Group æ+à[Ä8- •_z!LN«#ô •.] û#Ö Ì"å_ðO‹N«1÷$?#ó5Ý"‡!LO‹N« Û



<Ï&Â •åImport Groups æ+à[Ä8- •_ð2Ð#õ •2ð åOKâê



4.2.1.9 Access Rights

do+àE 2 +àAX-3 Lâ!þ3Ž" &O ñ 2+à\H3Ž" #±=6Y¯Fk7*f7[¥+• ÛE 2 KˆCíh`FÕ$såusers and groupsæƦ3#ó•E 2 /¬hb6 QÚ+ø ç E 2 O‹N«Fk1÷$? • û#ÑPädo+àE 2 O‹N«[¥+•4´ C7*f7 Û

6%I! Access Rights FkYh<) •

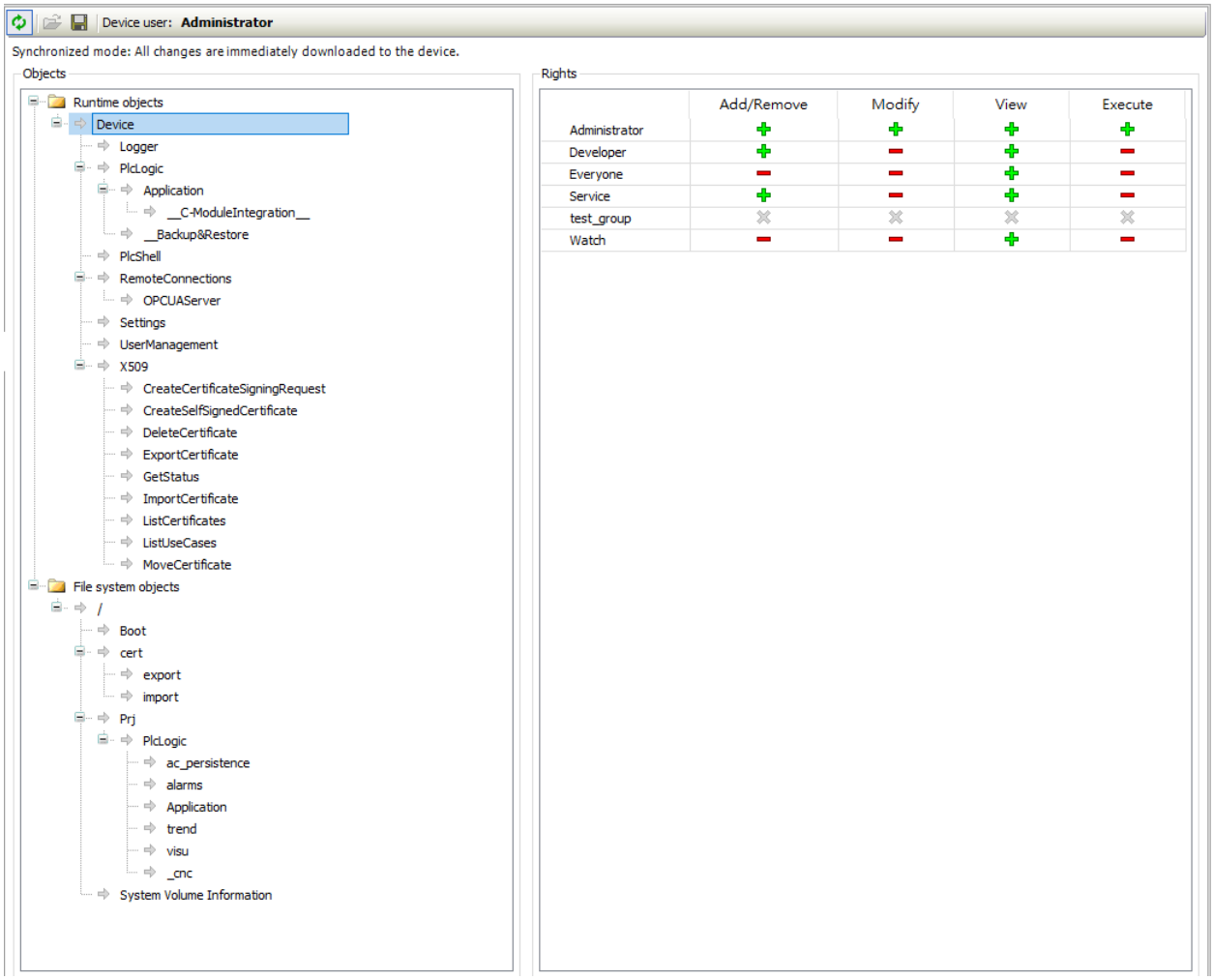
z ' DIADesigner-AX _ðh`a³ •/¬hb_ð2Ð[¥(îNý_x&OLb" 24 ' 6%I!7*f7[¥+•FkE"gI Û

Note • DIADesigner-AX _ðh`#Ö ÌX'[¥(î3¶_×YmF½ Û

3o o Access Rights FkYh<)6 do+àE 2 O‹N«[¥+• •

z E 2 KˆCíN« Ý/¬hb' _À AX-3 Lâ!þ3Ž" &O ñ6 #ÖE Fk •_À6 6ç "YhFkYh<) Û

z E 2 #±E 2 O‹N«[¥+•' åUsers and Groups æ!íh\ A[¥+• Û



z -Ì!^7ö

!]O»cì	Z²4Ì
Synchronization	2:.ç$s!ZeÔ[¥(î ñNý_x&O$sE 2 KˆCíeÛFk#ó;L"†Pä 1. 7 2ð ò2ðd• •Ný_x&O !JaFd 2. 2ð ò2ðd• •Ný_x&O õFÕ"4_Å3Œ[¥(îFkE 2 _ÂX3#ó;L 3. Ný_x&O õ[¥(î ñ 2[¥+• ô#ó5Ý •" 6ð3·I! È0V •_ðh` • z Upload from the device and overwrite the editor content • µ[¥(î ñ_d " Ný_x&O •YmF½FÕ"4!l+ Û z Download the editor content to the device and overwrite the user management there •+íNý_x&O!l+ ò_dQÚ[¥(î •.].{E +j Û
Import from disk	µ5n Ý +ã!LE 2 KˆCía4OU
Export to disk	+íFÕ"4E 2 KˆCía4OU+ã!á •+?" 5n Ý
Device user	FÕ"4Fb!L[¥(îFkE 2 #ôI×

z Object

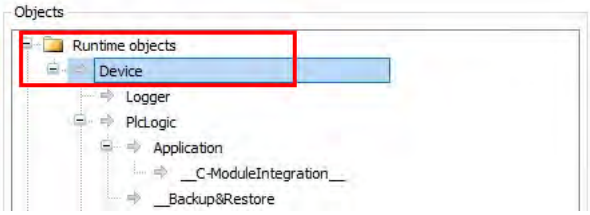
Z²4Ì
' 7øB•Nº7k •!þ!á#Ö Ì' _·X35Ý+à!]2NX3"• CFk+à\H Û;¶ +à\H „!]!íLb!íN«3y!þ,<.ç Û' Rights E"gI •#Ö Ì+à2'_ð2ÐFk+à\H#¢[¥+•O‹N«2'2Ì6ðFk7*f7 Û
Object source ‹8 Ri@ Œ z Runtime objects > Device •_À ,+à\H •#Ö Ì+í7*f73o o AX-3 Lâ!þ3Ž" &OFÕ"42NX3FÕ/<Fk5n Ý) Û z File system objects > / •_À ,+à\H •2'6ð' AX-3 Lâ!þ3Ž" &O !^6ð' N¦+?#½Fk+à\H`ä#¾" KˆCí •&Ç ;K/¬hb3Ž" [¦eÕ7*f7 Û 2'6ð+à\HFk3¶_×`ä' XO • Overview of the objects Û
Object groups and objects ‹O #ï Œ r)i •Device 6ð+7Ri@Logger kPlcLogic k Settings k UserManagement

z Rights

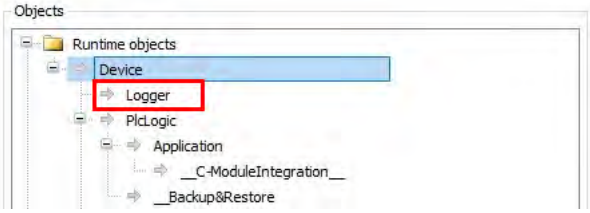
Z²4Ì
`. •[¦eÕ7*f76 µ8 +à\H ‹Device 1ý6 / ŒNÎ2f" +7+à\HFk Û)i7ƒO‹N«Fk7*f7X'Ih;I1ý3o o' B +à\H •" /X$´2'6ð+7+à\H Û _À XO_éE u7øB•Nº7k _ð+•Fk+à\H Û+à u;¶ E 2 O‹N« •6%I!FÕ"4+à u;K+à\HPä AFk+?#½[¥+•7*f7 Û   +à u+à\HPäa®#½FkX3 ! • z Add/Remove z Modify z View z Execute
#<!â+à\H#õ •#Ú Ž Rights XO 6%I!2'_ðFk+à\H •FÕ"4E 2 O‹N«Fk[¦eÕ7*f7 Û XO8##Ö Ì/Ò` 7ÌFò • z `Š ,[¦eÕ7*f76 E +à\H[« z $Ñ O‹N«E 2 +à$Ñ +à\H6ð § /6ð5/7*f7 XO8# K #ÞFk=œ 0 • x •5õHU3o o[¦eÕ7*f7 x •5õHUIh;I[¦eÕ7*f7 x •` _®NÎ2f3o o[¦eÕ7*f7 x •` _®NÎ2fIh;I[¦eÕ7*f7 x •<ˆ6ð5õHU3o o1ýIh;I[¦eÕ7*f7 • û F7 NÎ2fB +à\HFk[¦eÕ7*f7 Û5Ç<¼+?#½ Û x <ˆ6ðK #Þ •_ð2Ð) +à\H • û#ë+à\H!^6ð ô#óFk[¦eÕ7*f7 Û #<!âK #Þ#Ö Ì Õ5 7*f7 Û

z 2'6ð+à\H!l+ =6Y¯ •

‹ Runtime objects > Device

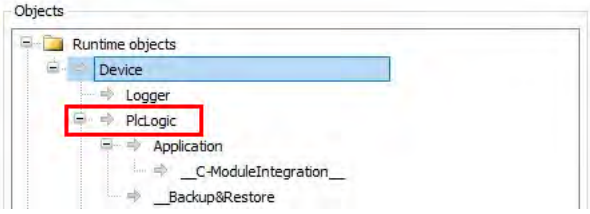


¾ Logger •' N¦ fE Logger 6 #Ñ[â Û2' Ì#ÑPä3o o=6Y¯1ý6 Ih;I+?#½Fk7*f7 Û



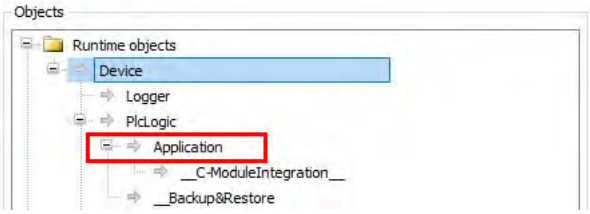
4

¾ PlcLogic •



' ò_d_®lò •2'6ð IEC Application `ä C !+7+à\HQÑ"•3¹!L;K(ë Û/: ç Application X'" fK5Ý • +j+íQÑ"•X'lâfK Û+à Application NÀ' ' N¦ fE FkB`+•3Ž" Û#Ö Ì' PlcLogic Fk2'6ð Application f-!ía4!]7*f7 ÛKˆCí$?$s.ç#¸ ¡$?E 2 O‹N« •+à IEC applications 6ð+s!O[¦eÕ7*f7 Û6ô"ˆ$sF¸Y-E 2 O‹N« •" #Ñ6ð[â#½7*f7 ‹ r)i •#Ñ[âF¸Fò5W # ŒÛ

¾ Application •



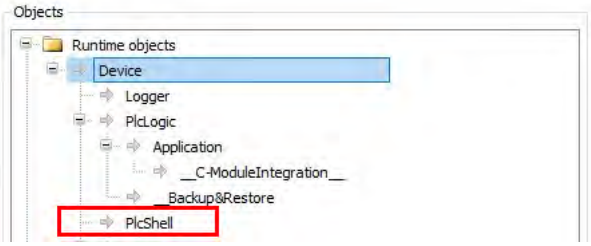
òXOB`" !þ!á' IEC application [¥+•[¦eÕ7*f7#õ •2'#¾/X$´Fk"• C Û

x •Ih;I[¦eÕ7*f7 Û

" •!([Ÿ[¦eÕ7*f7 Û

	4´ C	[¦eÕ7*f7			
		Add/Remove	Execute	Modify	View
Application	Login	"	"	"	x
	Create	x	"	"	"
	Create child object	x	"	"	"
	Delete	x	"	"	"
	Download / online change	x	"	"	"
	Create boot application	x	"	"	"
	Read variable	"	"	"	x
	Write variable	"	"	x	x
	Force variable	"	"	x	x
	Set and delete breakpoint	"	x	x	"
	Set next statement	"	x	x	"
	Read call stack	"	"	"	x
	Single cycle	"	x	"	"
	Switch on flow control	"	x	x	"
	Start / Stop	"	x	"	"
	Reset	"	x	"	"
	Restore retain variables	"	x	"	"
	Save retain variables	"	"	"	x

¾ PlcShell •;K(ë#Ñ6ð å Õ5 æ7*f7 Û#Ñ6ð/: Õ5 7*f73o oE 2 O‹N«#õ •24Pä fE PLC shell $d Ë Û



¾ RemoteConnections •#Ö Ì' ;KRi@ ò5 a4OU" AX-3 Lâ!þ3Ž" &OFk!]+j (ý`Ï_ÅNº Û çR • OPC UA server Fk fE #Ö Ì' ;K(ë[¥+• Û

4

¾ Settings •' N¦ fE •+à AX-3 Lâ!þ3Ž" &OFka4OU[¥+• Ûn¿[‹ ! Õ5 7*f7#Ñ3o oKˆCí$? Û

¾ UserManagement •' N¦ fE •+à AX-3 Lâ!þ3Ž" &OFkE 2 KˆCí Ûn¿[‹ ![â#½ /!€!L7*f7#Ñ3o oKˆCí $? Û

¾ X509 •

_À3Ž" X.509 [‹[¨Fk' N¦ fE Û;K(ë6ð I´[¦eÕ7*f7Lb'r •

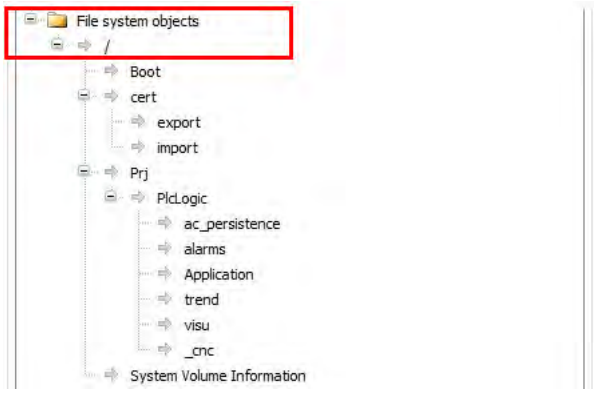
x Read [â#½‹ View Œ

x Write !€!L ‹Modify Œ

;¶h`4´ C`ä!ía4_À I´7*f7 2 ç Û;¶h`4´ C`ä C !+7+à\H3¹!L' X.509 ò5 Û&Ç;K • /:"4#Ö Ì_Â ç ;L/•[ê;¶ 4´ CFk[¦eÕ7*f7 Û

‹ File system objects > /

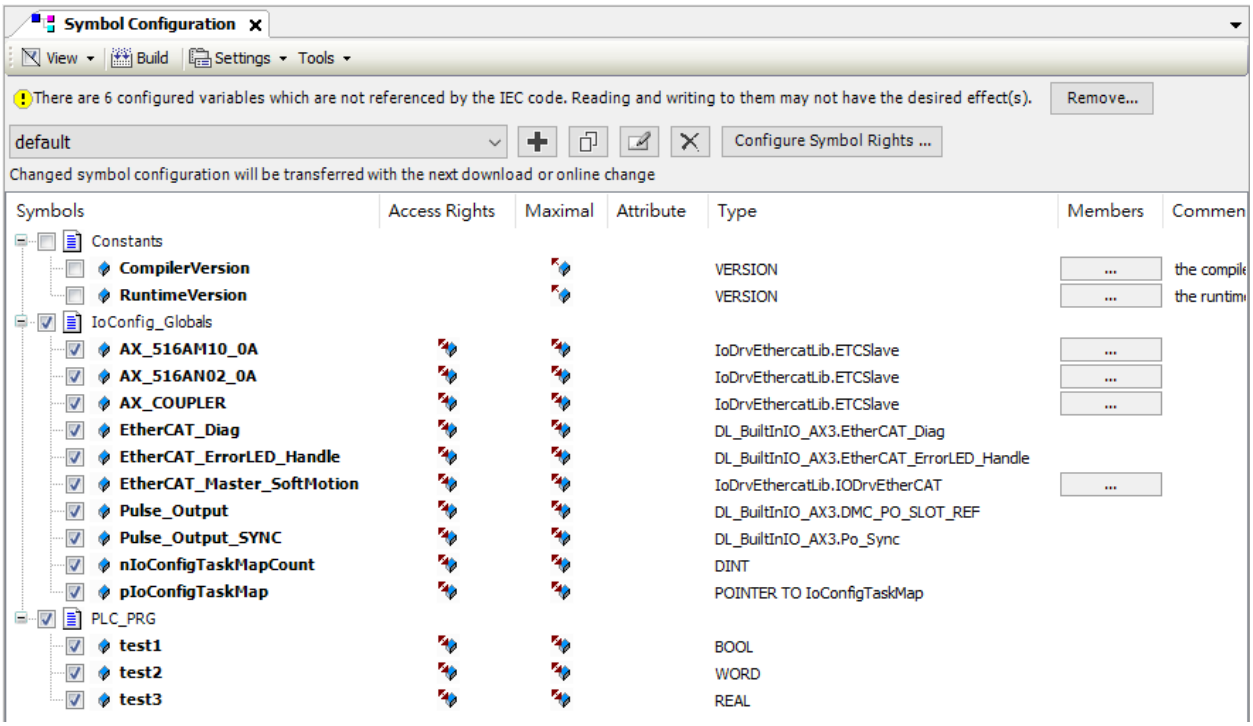
AX-3 Lâ!þ3Ž" &O2NX3]Ö/k Fk2'6ð5n Ý) `ä3¹!L' å/ æ5n ÝLâNÆ+à\H ò Û f G#Ö Ì3o o5n ÝLâNÆFk;¶ 5n Ý) B`+•Fk7*f7 Û



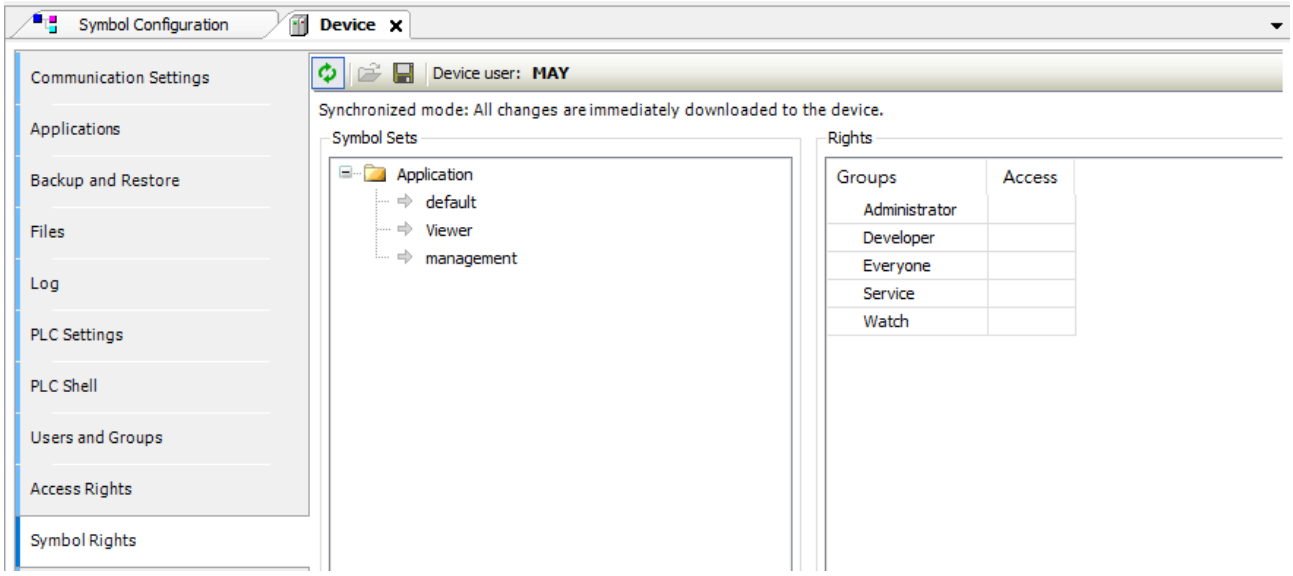
4.2.1.10 Symbol Rights

+• 0 ô#óE 2 O‹N« ‹+‰2 JÖ Œ•+àAX-3 Lâ!þ3Ž" &O ñ#ÖE Fk#< K #Þf-Fk[¦eÕ7*f7 Û

Yh<) •/¬hb' PLC ñ[¥OUE 2 Kˆa³ Û-ÙN¶+í ç Application ò_d" AX-3 Lâ!þ3Ž" &O • û AX-3 Lâ!þ3Ž " &O' DIADesigner-AX Object 6ð+• 0 må Symbol sets æÛE 2 O‹N«!^6ð' AX-3 Lâ!þ3Ž" &O Fb!LFk5W3U[¦eÕ 7*f7 Û

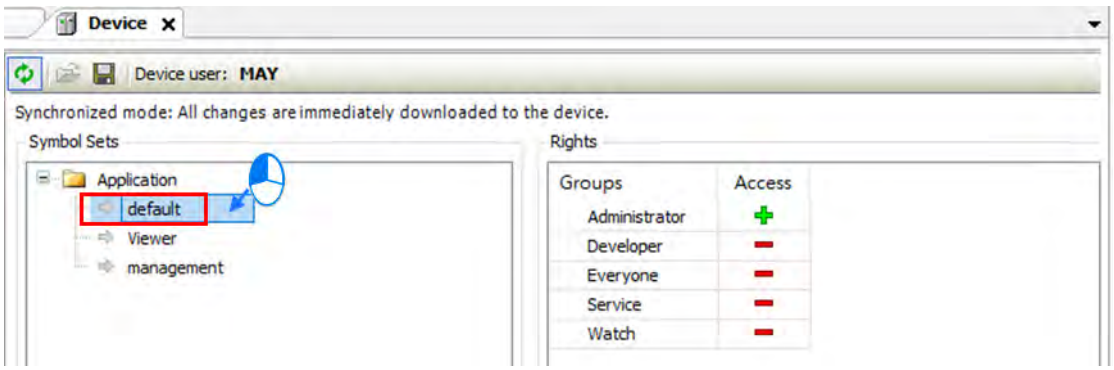


' åSymbol Sets æJ~#Ê •2'6ðFkK #Þf-`ä!þ' Application Ri@ ògI •Ri@ Fk+• 0 õ.{E Iò.v ç]^ ò_d " AX-3 Lâ!þ3Ž" &O Û



4

' å Rights æJ~#Ê •XOa³!þ!á' AX-3 Lâ!þ3Ž" &OFkE 2 KˆCí +• 0FkE 2 O‹N« Û_ð2Ð Symbol Sets #õ#Ö ÌFò" +à.{Fk7*f7 Û ✚ •!([Ÿ+?#½ Û ━ •Ih;I+?#½ Û G#Ö Ì` _®#³!âK #Þ7L#¿6Û7*f7 Û



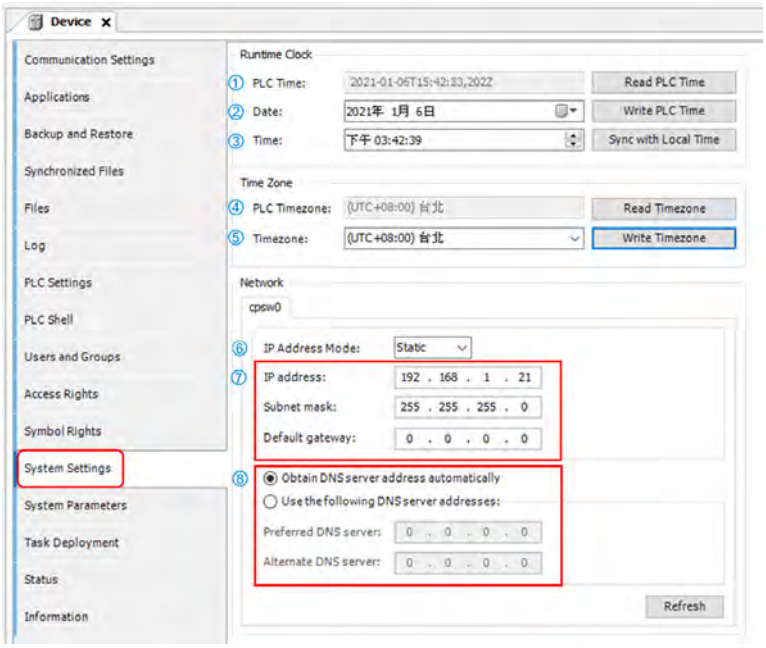
#<!â2ðd•#Ö Ì+íFÕ"4+?#½Fk[¥+• Ä+?" XML 5n Ý Û!]5n ÝLb'r ! Device symbol management files ‹ *.dsm Œ#<!â#Ö µ[ˆK~7!a³[â#½Fß#óLb'rFk5n Ý Û

4.2.1.11 System Setting

' AX-3 Lâ!þ3Ž" &O o LâNÆFß!Z[¥+•#Ö'åSystem Settingsæ\gI_ÂX3[¥+• Ó ó[¥+•"4[Þ!/HU[‹ DIADesigner-AX õ3Ž" &O-Ù;J. P;7! •P;7![ÍN-[¥+•[Þ#©OêK 4.2.1.1 Ri/: Fk!I+ Û

<Ï • ' DIADesigner-AX V1.0.0 B/ •;K!íh\#ôI× ! åRuntime Clock Configurationæ' DIADesigner-AX V1.1.0 B/ •E u5—(..IP Address [¥+•"†Pä •&Ç;K Õ5 !íh\#ôI× ! åSystem Settin gsæ

' å Device æ > å System Settings æ



z Runtime Clock

š PLC Time •PLC FÕ"4Fk5Ì7 -5ÝeÛ È0V ÛRead PLC Time •[â#½/:"4 PLC 25Ì7 - 5ÝeÛ È0V Û

› Date •_V Ý3Œ#Ê ñFk5Ì7 È0V ÛWrite PLC Time ••í[¥+• 25Ì7 - 5ÝeÛ •!€!L PLC Û

œ Time •_V Ý3Œ#Ê ñFk5ÝeÛ È0VSÝnc with Local Time • õ Local PC #ó;L5Ì7 - 5ÝeÛ È0V Û

z Time Zone

• PLC Timezone • PLC FÕ"4Fk5Ý#! È0V ÛRead Timezone•[â#½/:"4 PLC 25Ì7 - 5ÝeÛ5Ý#! È0V Û

ž Timezone • PC FÕ"4Fk5Ý#! È0V ÛWrite Timezone ••í[¥+• 25Ý#! •!€!L PLC Û

z Network

r: IP Address Mode • Static Ûg@/èIP Û

r; IP [¥+• •E E 2 QÑX3_z!L IP Address/Subnet mask/Default gateway

r< DNS [¥+• •E 2 #Ö fE QÑ"•#½/~ DNS 6ô"^&O' " •1ý fE QÑX32î+•Fk0ÖE DNS 6ô"^&O' "1ý !]+j DNS 6ô"^&O' " Û

<Ï •AX -3 Lâ!þ "7!3¶_×5n Ý ‹DDF Œfç u V1.0.1.0 B/7 Ì ñ ‹$ Œ•24#Ö' ;Kh\gI_ÂX3 Network #©5W[¥+• Û

4.2.1.12 System Parameters

åSystem Parameters æh\gI[¥+•#ëh`#©5W)i ò #ÖE ò2°_ð#<1ý' _z!L+>;œ(R!L_é/:Fk5W # •ò_d" AX-3 Lâ!þ3Ž" &O • û;Kh\gI#©5W[¥+• ô5 2è' N¦F¸3Ž5Ý!€!L#©5W"†Pä Û

z I/O module CONFIG by Manual/Max when Power On
[¥+• AX-3 Lâ!þ3Ž" &O: '>a4OU: .ö Û

¾ Manual ‹n¿[‹ # Œ• „3U E 2 E CONFIG +• 0 Û[¥+•a4OU õ+…f,a4OUhb+s!OK #ï •" #Ö;J. _·X3 Û

¾ Max • „3U CONFIG a4OU: '>5Wa¶RÌ) u+…f,a4OU: '>5W •" #Ö_·X3 ÛRÌ+ö u+…f,a4OU: '>5Wa¶ • " 6%I![M2Œ Û

z CPU module Stop when I/O Module No Response
[¥+•/:_Å3ŒFk2P,< '>!] 6ð` [–5”N¦5Ç$´.{1ý5Ç<¼3Ž" Fk: '>5Ý • AX-3 Lâ!þ3Ž" &O õ!]+j;J. Fk: '>6 $ 2èNÔ_·X3 Û

¾ Stop ‹n¿[‹ # Œ•AX -3 Lâ!þ3Ž" &O C;I û&Å2Œe [Ö Û5,fƒ3yfK#õ •AX -3 Lâ!þ3Ž" &O/¬hba´5— ñE 24 Pä;J. _· C Û

¾ Keep RUN •AX -3 Lâ!þ3Ž" &O õ!]+j;J. : '>NÎNÔ_·X3 Û

z CPU module Stop when I/O Module Occurred Error
[¥+•/:2P,< : '>!áC—_b/•e [Ö5ÝFk(ëCí5 .ö Û

¾ STOP •AX -3 Lâ!þ3Ž" &O C;I û&Å2Œe [Ö Ûe [Ö3yfK#õ •AX-3 Lâ!þ3Ž" &OPäa´5—_·X3 Û

¾ Keep RUN ‹n¿[‹ # Œ•AX -3 Lâ!þ3Ž" &ONÎNÔ_·X3 • - [—/<[M$1 È0V Û

z Select Action when 24Vdc Input unstable
#Ö_ð2Ð24Vdc E >w#¸E]ÚE B•!œFk(ëCí7!" Û

¾ Continue Running when power stable‹n¿[‹ # Œ•: 24Vdc ,.{E >w#¸E ôJ +•B•!œ5Ý QÑ"• STOP K0/lE >w0I(ôJ +• 2#õ •!t2èNÔ_·X3 RUN Û

¾ Into Error Status •/: 24Vdc ,.{E >w#¸E ôJ +•B•!œ5Ý •/!" PLC _Â!L STOP B•/è •.] û ERROR @V/ÒeÑ •E >w0I(ôJ +• 2#õ • ´A Ä2è' STOP B•/è Û

z Show Battery Low Voltage Error

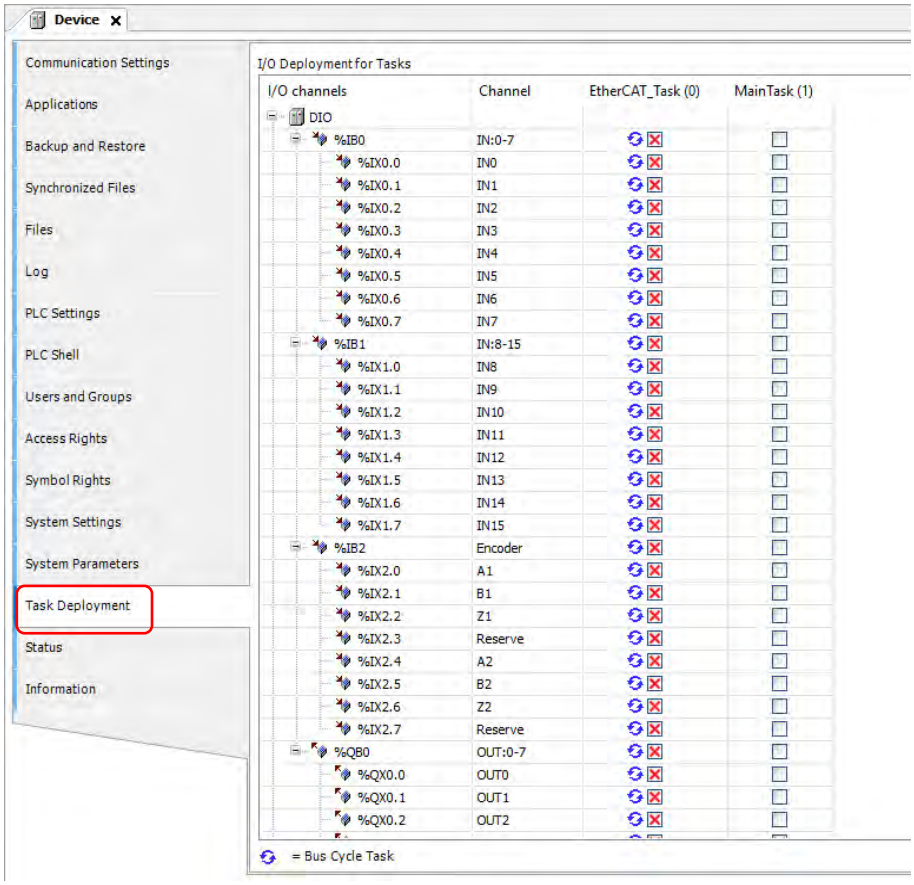
/:[—/<5ÝeÛFkdéE <G(ë u 5E #rB•/è1ý7 +pX¬5Ý •#Ö Ì[¥+•6 $ 6%I![M2Œ Û

¾ Disable •déE <G(ë u 5E #rB•/è1ý7 +pX¬5Ý • ô6%I![M2Œ Û

¾ Enable ‹n¿[‹ # ŒdéE <G(ë u 5E #rB•/è1ý7 +pX¬5Ý •6%I![M2Œ Û

4.2.1.13 Task Deployment

E 2 #Ö Ì' ;Kh\gI7Ì[É_z!L õ_z!á@ •2'X'2î=%Fk task õ Bus cycle task •/:2NX3Nº7ƒ ô)ihk7 5Ý • E 2 #Ö Ì` _®_À , È0V_ÂX35,fƒ3yfK •;Kh\gI È0V ¬' h`FÕNý[¸_®#õ •.] ò_dQÚ3Ž" &O#õ24 _ÂX36Û5— Û



	;K task ! Bus cycle task
	_z!L1ý_z!á@ õ;K task X'!€!L1ý[â#½

4.2.1.14 Status

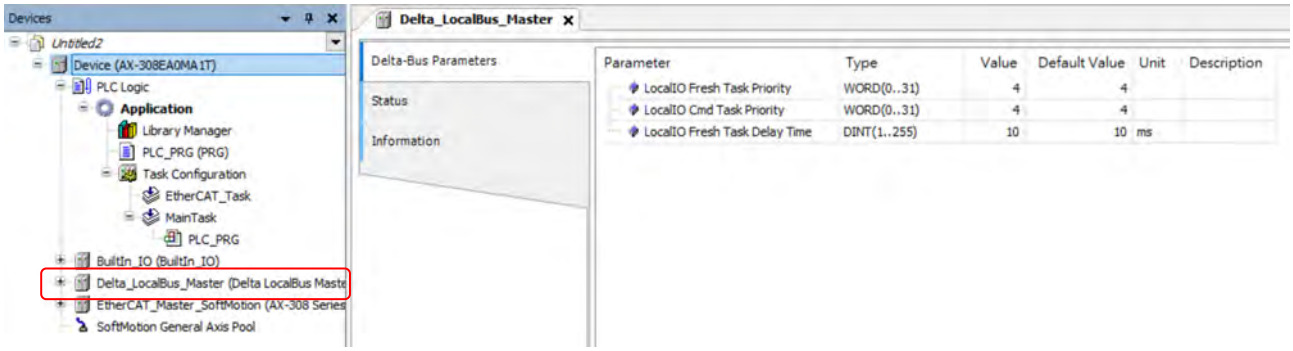
E 2 #Ö' ;Kh\gI7Ì[É3Ž" &O!l`Ï_·X3B•/è •)i Running ÚStopped õ!]+j B`+•[Û5õ •. "•E 2 mYÊ3Ž" &O /:"4_· C0¬/I Û

4.2.1.15 Information

;Kh\gI6%l!/:"43Ž" &OFß!Z È0V ì$ m7!l´ Ú ` %- ÚŽ$¨Fß!Z22!s ÚgÎ :B/7 ÚŽ$¨ ÊGè Ú3Ž" &O runtime B/7 õ3Ž" &OgÎ :B/7 K0 È0V… Û

4.2.2 1'+ 8ß& "€4.Z|*X

' 2P,<: '>#©5W[¥+•h\gI •E 2 #Ö Ì „AN fE Fkfç<) •QÑX3[ê5[2P,<: '>Fß!Z Task ÿ!/7* õ6Û5—Fk5ÝeÛ Û



z LocalIO Fresh Task Priority oã

;Kh`FÕ ! "7! õ2P,<: '> 2eÛ5W3U ‹3I Task Fk ÿ!/7* •!]#Ö[¥+•Rê&Û ! 0~31Ûk 1 Œ

z LocalIO Cmd Task Priorityoã

;Kh`FÕ ! "7!2P,< : '>$d Ë_·X3 Task Fk ÿ!/7*, !]"ì$: '>_·X3: .ö ‹Run / StopŒÉ 2P,<: '>#©5W[â!€ Ú From/To 2î ËK0… •!]#Ö[¥+•Rê&Û ! 0~31Ûk 1 Œ

z LocalIO Fresh Task Delay Timeoã

;Kh`FÕ ![ê5[2P,< : '>+…f,_z!L/ _z!áFk$O7 5ÝeÛ •E 2 #Ö Ì8 3U2'a4OUFk2P,<: '>Lb'r, 3• 2'fç_·X35Ý eÛ.]_ÂX3[¥+• • òXO !#ë: '>5W3U ‹3I2'fç5ÝeÛ Û‹!]_· C=(Iò#Ö#©OêK 4.4.1.2 Ri å) -Ì C2NX3 æŒ

Module	TimeoÑmsoÒ	Module	TimeoÑmsoÒ
AS02HC	‹<Ï 2 Œ	AS08AM	0.6
AS02PU	1.5	AS08AN	0.6
AS04PU	2.1	AS06RTD	0.9
AS02LC	0.6	AS16AP11R	1.2
AS02ADH	0.6	AS16AN01T	0.6
AS04AD	0.9	AS16AM10N	0.6
AS04DA	0.9	AS06XA	1.5
AS08AD	1.2	AS32AM	0.6
AS04RTD	0.9	AS32AN	0.6
AS04TC	0.9	AS64AM	0.9
AS08TC	1.2	AS64AN	0.9

<Ï 1 • â0ö[ê5[-Ì C ÿ!/7* •#ÖPä` 1÷: '>1ý6 EtherCAT K0!]+j$O_ "†Pä.é. Û

<Ï 2 •;K: '>5W3U ‹3I2'fçFk5ÝeÛ •6 „3Uh`FÕ!I2' fE " Fk2î ËOó6ð2' ô#ó Û

4.3 4.2,K9&I Ì"–`•

4.3.1 4.2,K9&I

4.2,K9&I	5¾*Í ú	5¾'å ú	4.2,d=-d
BOOL	FALSE	TRUE	1-bit
BYTE	0	255	8-bit
WORD	0	65535	16-bit
DWORD	0	4294967295	32-bit
LWORD	0	2^{64}-1	64-bit
SINT	-128	127	8-bit
USINT	0	255	8-bit
INT	-32768	32767	16-bit
UINT	0	65535	16-bit
DINT	-2147483648	2147483647	32-bit
UDINT	0	4294967295	32-bit
LINT	-2^{63}	2^{63}-1	64-bit
ULINT	0	2^{64}-1	64-bit
REAL	-3.402823E+38	3.402823E+38	32-bit
LREAL	-1.7976931348623157E+308	1.7976931348623157E+308	64-bit
TIME	T#0ms	T#49d17h2m47s295ms	32-bit
LTIME	LTIME#0ns	LTIME#213503d23h34n33s 709ms551us615ns	64-bit
TIME_OF_DAY ‹TOD Œ	TOD#00 •00 •00.000	TOD#23 •59 •59.999	32-bit
DATE	D#1970-1-1 ‹ 01/01/70 Œ	DATE#2106-2-7 ‹ February 07 • 2106 Œ	32-bit
DATE_AND_TIME	DT#1979-1-1-00 •00 •00 ‹ 01/01/1970 00 • 00 •00 Œ	DT#2106-2-7-6 • 28 •15 ‹ February 07 •2106 6 •28 •15 Œ	32-bit
STRING	ASCII +>K ‹8- bit Œ•6ç) 255 +>K Û		
WSTRING	Unicode +>K ‹ 16-bit Œ•ef.•5Çf7" Û		

4.3.2 "–4.

#¿a¶$d#ôY«" •

- z ô#Ö"ì$ JaFd1ý6 !Ze [´ Û
- z ô#!!í) +ö!€ Ûr r)i •Var0 õ VAR0 Y- !#ó ç#¿5W Œ
- z ô#Ö Ì_ÅNÔ fE ò.|N¦ Ûr r)i •b_Var0 !([Ÿ fE •b__Var0 ô!([Ÿ fE Œ

#¿a¶a´(ô$d#ôY«"

- z ,'`Ï#¿a¶ ô#Öa´(ô$d#ô Û
- z)i!O,'#¿a¶ õ,'`Ï#¿a¶a´(ô$d#ô •" ,'`Ï#¿a¶2Ì6ð_jj¿Fk ÿ!/7*
- z ' ô#óFk!O,'#¿a¶XO •#Ö Ì$d#ôFß#ó#ôI×Fk#¿a¶ Û

  ‹ r)i globe_list1.bvar õ globe_list2.bvar ! ôFß#óFk!O,'#¿a¶ Œ

(î<Ï

- z #<X3(î<Ï å// æÛr r)i •// Variable Define Œ
- z) X3(î<Ï6 E " ‹ * ".ç)² •QÚ" * Œ ¶Nº7F Ûr r)i •*Variable Define* Œ

4.3.2.1 "–`•*a#

' DIADesigner-AX _V Ý #¿a¶Fk'á7 #¿a¶Fk+Š$15 .ö)i ò •

[Ô<¼ •<#¿a¶#ô> • <#¿a¶Lb'r> • = <")² #> ž

Rê r •

5WN«

[Ô<¼ •<#¿a¶#ô>•ARRAY[0..N] OF < 5W3ULb'r•

4.3.2.2 *¹%þ

' AX-3 Lâ!þ3Ž" &O!l+? •&O#Ö Ì!í1÷ ð #!eÛ •!í" ! I‹_z!L!l+?#!eÛ ŒÚ Q‹_z!á!l+?#!eÛ Œ õ M‹7î /¾!l+?#!eÛ Œ ðI´ •' Ný!€Iò.v5Ý#Ö ÌFÛ3Œ+à!l+?+â" fE Û

[Ô<¼ •%<!l+?#!eÛ ><!l+?ef.•>< !l+?' " > Û

C* !ød²	Z²4Ì	!ød²QÁ%²
I	_z!L!l+?	8 KB
Q	_z!á!l+?	8 KB
M	7î/¾!l+?	512 KB

C* d=-dIä"µ	4.2,6ú-Í	4.2,d=-d
X	--	1-bit
B	Byte	8-bit
W	Word	16-bit
D	DWord	32-bit
L	LWord	64-bit

<Ï 1 •AX -3 Lâ!þ "7!!l7î/¾!l+? ‹M Œ• u' N¦: .ö5Ý5Ç<¼22"•_ÂX3 Bit 4´ C Û

z C* N,

' _ÂX3!l+?' "Fk+â" 2"4 •/¬hbYh!/ mYÊ6 ¶Fk!l+? 4OU •7L`f!4a´(ô+• 0+ãQÛFß yYmF½Fk0¬/I#¸E Û

C* !ød²							
X0.63~X0.56	X0.55~X0.48	X0.47~X0.40	X0.39~X0.32	X0.31~X0.17	X0.23~X0.16	X0.15~X0.8	X0.7~X0.0
X7.7~X7.0	X6.7~X6.0	X5.7~X5.0	X4.7~X4.0	X3.7~X3.0	X2.7~X2.0	X1.7~X1.0	X0.7~X0.0
B7	B6	B5	B4	B3	B2	B1	B0
W3		W2		W1		W0	
D1				D0			
L0							

z =CæQÁ I

QÁ I	Z²4Ì
%QX7.5	_z!á!l+?#!eÛ Bite X7.5
%IW215	_z!L!l+?#!eÛ Word W215
%QB7	_z!á!l+?#!eÛ Byte B7
%MD48	7î/¾!l+?#!eÛ Double Word DB48
VAR wVar0 AT %IW0 • WORD ž	+í#¿a¶wVar0 +â"QÚ_z!L!l+?#!eÛ Word W0

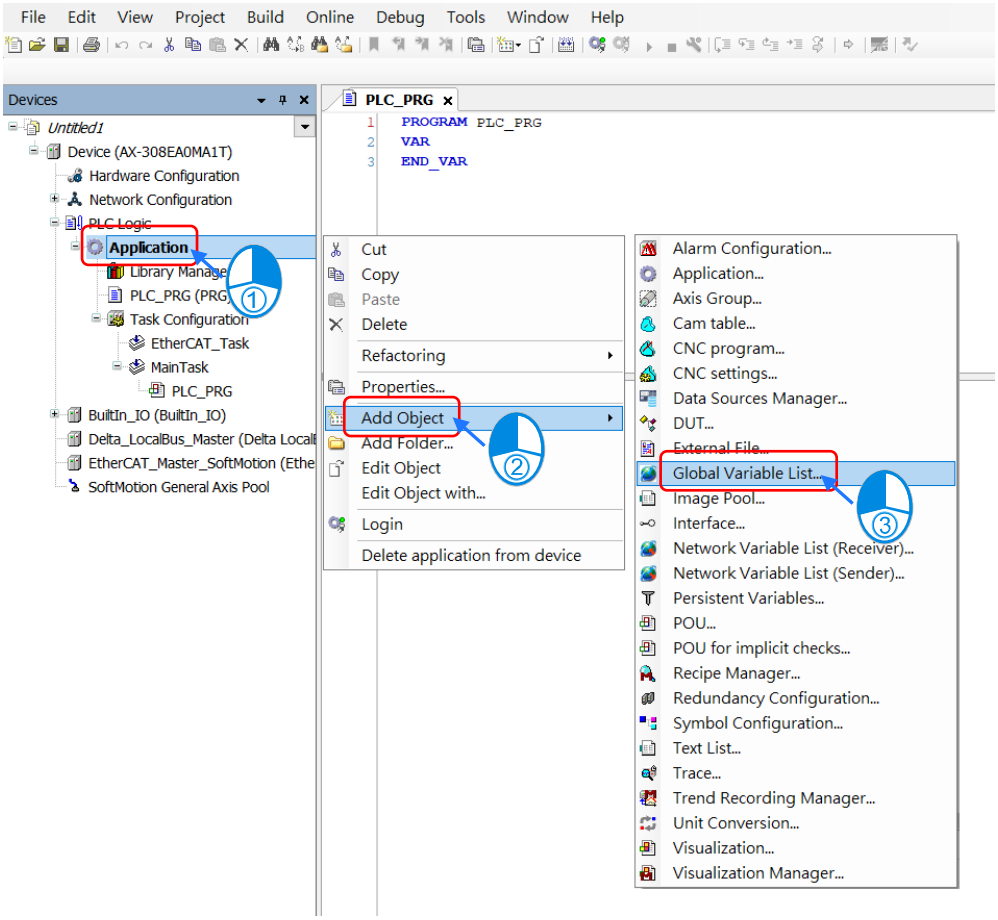
QÁ I	Z²4Ì
END_VAR	
VAR bVar0 AT IX7.5 • BOOL ž END_VAR	+í#¿a¶ bVar0 +â''QÚ_z!L!l+?#!eÛ Bit X7.5

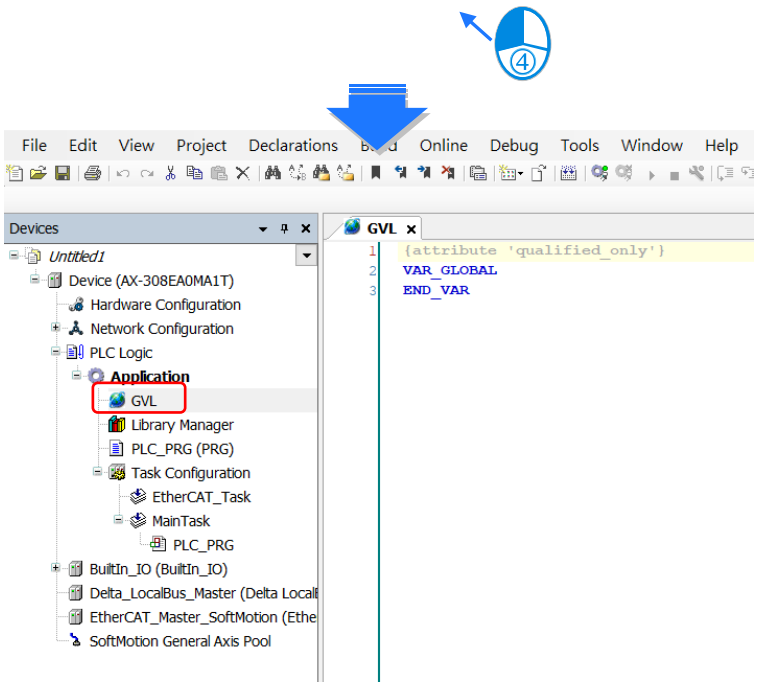
4.3.2.3 "–`•K9&I

z &*þ"–`•

' #ë POU !l2'+Š$1Fk#¿a¶ !,'`Ï#¿a¶ •#ÑPä' /:"4 POU !l fE •Oó Global Variable List !l2'+Š$1Fk #¿a¶ ‹!O,'#¿a¶ Œ •" #Ö ÌX'2'6ð POU fE Û

Global Variable List 4n'\oã





z ,ö4.&l"–4.

)i; fE . 5W'r#¿a¶ • ¬fç+í#¿a¶+Š$11÷. 5W,E0 #Z#Ö •Oó. 5W'r#¿a¶#Ñ!([Ÿ[â#½ • ô!([Ÿ]2 # Û

,ö4.&l"–`•*a#

z Có ›1¿&l"–`•

)i; fE CE Ä2è'r#¿a¶ •" fç+í#¿a¶+Š$11÷ Retain ,E0 •1ý6 FÛ3Œ fE Persistent #¿a¶ •Oó çR #¿a¶ Ú Retain #¿a¶ õ Persistent #¿a¶ ðI´#¿a¶Fk-Õ.é0 #Ö Ì#©Oê ò!þXO8# Û

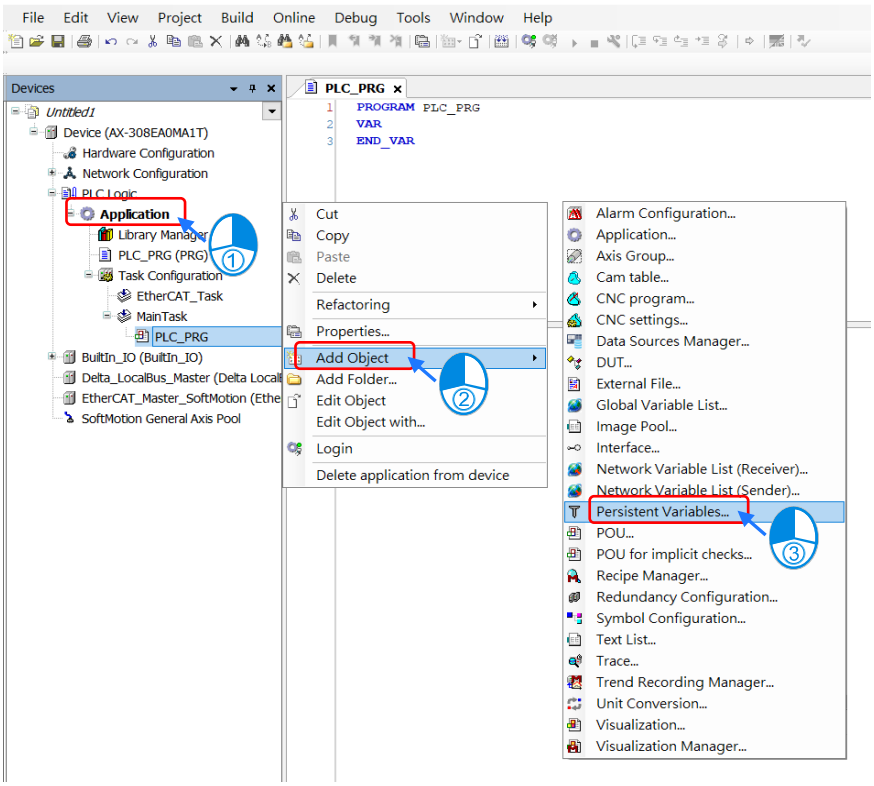
	Initialize				
	Reboot PLC	Reset warm	Reset cold	Download	Reset Origin
Variable	O	O	O	O	O
Variable Retain	X	X	O	O	O
Variable Retain Persistent	X	X	X	X	O

Retain "–`•*a#

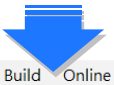
4

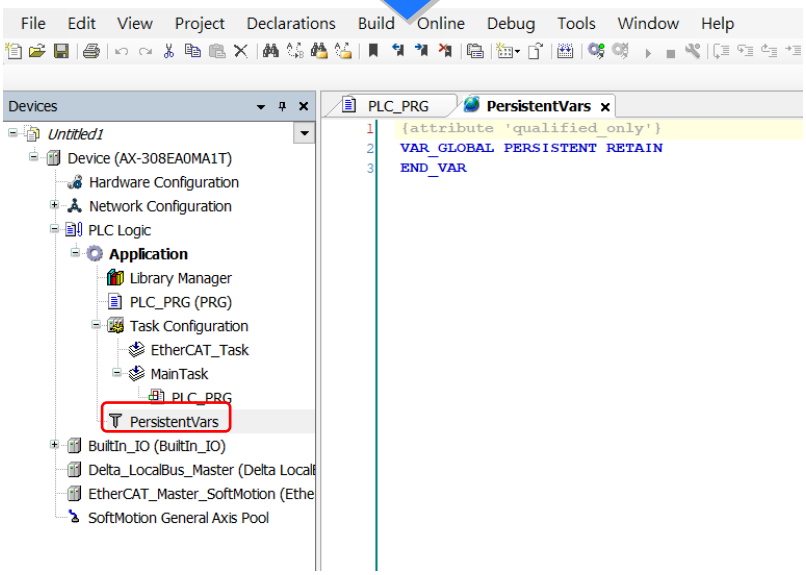
)iYh.áJ² Persistent #¿a¶ •" /¬hb' Persistent Variable _ÂX3+Š$1 • û RETAIN PERSISTENT Ú PERSISTENT RETAIN õ PERSISTENT _À ðI´#¿a¶+Š$1 CE FmFß#ó Û

Persistent Variable List 4n'\oã

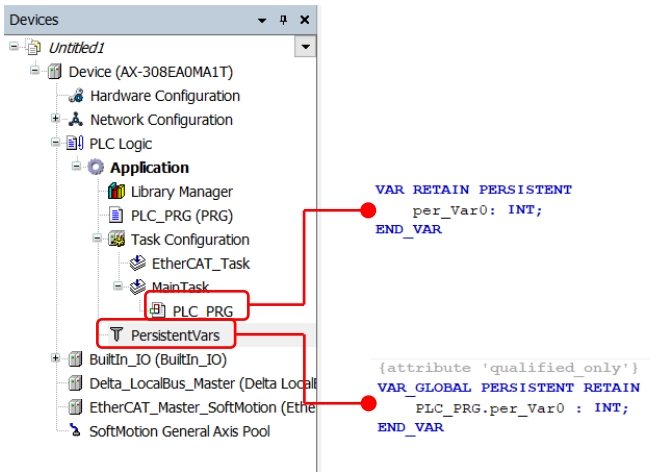


④




File Edit View Project Declarations Build Online Debug Tools Window Help
Devices
Untitled1
Device (AX-308EA0MA1T)
Hardware Configuration
Network Configuration
PLC Logic
Application
Library Manager
PLC_PRG (PRG)
Task Configuration
EtherCAT_Task
MainTask
PLC_PRG
PersistentVars
BuiltIn_IO (BuiltIn_IO)
Delta_LocalBus_Master (Delta Locall
EtherCAT_Master_SoftMotion (Ethe
SoftMotion General Axis Pool
PLC_PRG
PersistentVars
1 {attribute 'qualified_only'}
2 VAR_GLOBAL PERSISTENT RETAIN
3 END_VAR

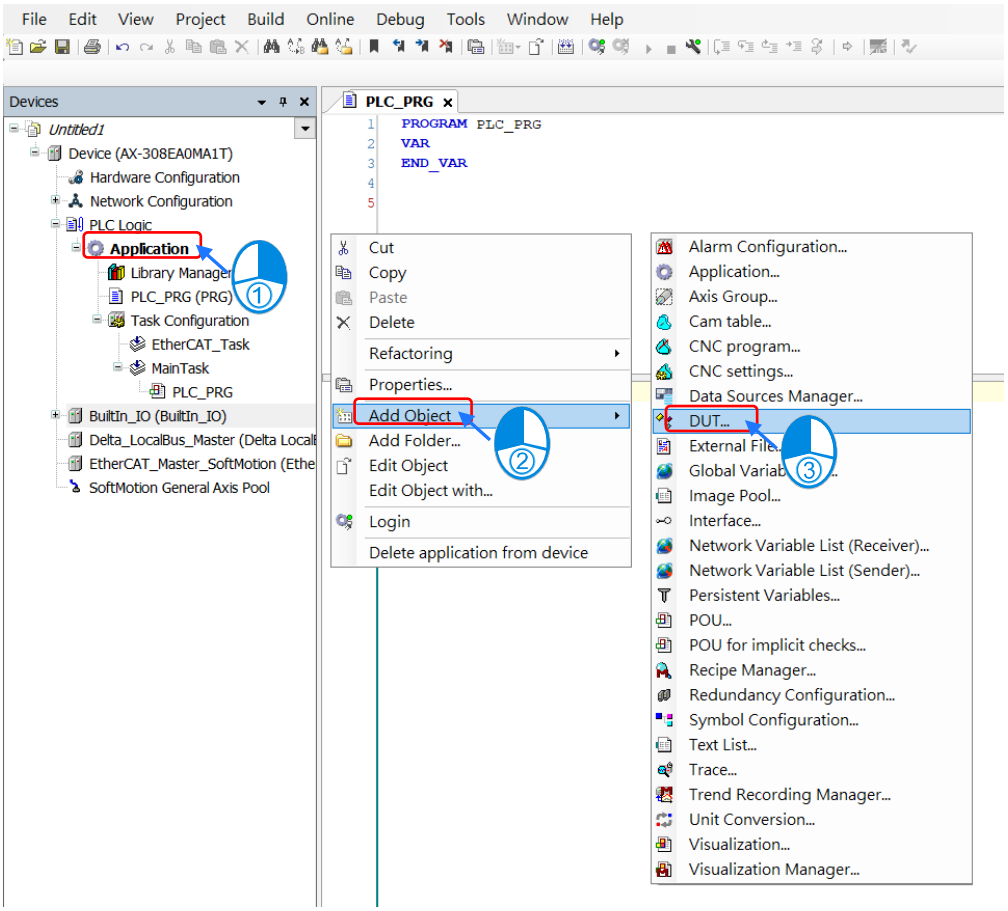
)ifç+í,'`Ï#¿a¶+Š$11÷ Persistent #¿a¶,E0 •" /¬hbYh+í#¿a¶Fk]Ö/k5—(…QÉersistent Variable +à\H!l Û



4.3.2.4 P¨*X 4.2,K9&I

QÑ+• 05W3ULb'r ‹I×DUT ‹Data Type Unit Œ1ýUDT ‹User -defined Data Type Œ Œ • ,E 2 N«#ïC—6ðFk 5W3ULb'r1÷QÑ+• 0 0Fk5W3ULb'r •!] fE Fk5 .ö ! •' 7ø/I&å5—(… DUT +à\H.]_ð2ÐLb'rLb'r •!]Lb'r#Ö Ì!í1÷ Structure ÚEnumeration ÚAlias õ Union &Âl´ Û

DUT 4n'\



z Structure

Nº7k ‹ Structure ŒE) I´5W3ULb'r#¿a¶2'N«1÷Fk5W3UNº7k •#Ö" E _À8 Fk5W3UNº7k5 ¦E 2 _ÂX35W3UFkKˆ Cí õ Õ5 Û

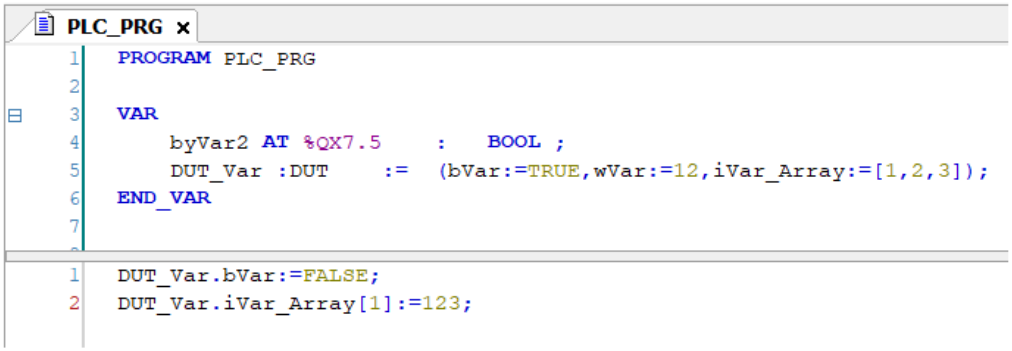
[Ô<¼ •

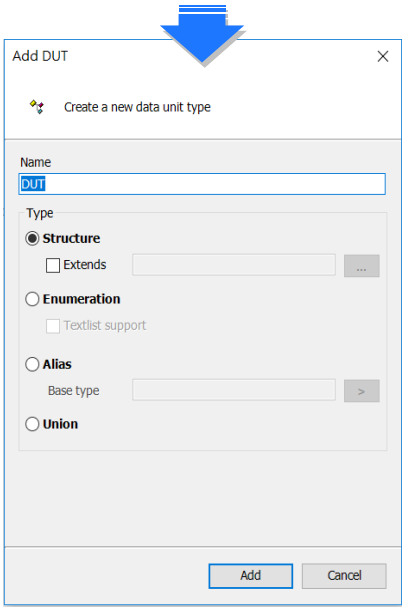
TYPE <Nº7k#ô>•
STRUCT
<#¿a¶+Š$11>
...
<#¿a¶+Š$1n>
END_STRUCT
END_TYPE

Rê r •

4

fE 5 .ö •





z Enumeration

7• %‹Enumeration ŒE u+• 0#¿a¶ õFß+à.{Fk5W # •_À8 Fk5 .ö_ÅNº m5W # õ!] ÊXOFk0ö 0 •fIò.v6Û=ì 6W5ú[â Û

[Ô<¼ •

TYPE <7• %#ô>•

‹

<K ç N« Ý+Š$1> •= N« Ý ÊXO5W # •

… •

<6ç#õ ç N« Ý+Š$1> • =N« Ý ÊXO5W #

Œ <á7 5W3ULb'r> •= 7• %n¿[‹ # ž

END_TYPE

Rê r •

4

z Alias

#Ö Ì' 'á7 Fk5W3ULb'r ñ •E 2 #Ö ÌQÑX3+• 05W3ULb'r Û

Rê r •

TYPE <Alias #ô> • STRING ‹20 Œ ž END_TYPE

z Union

Union !l2'+• 0Fk#¿a¶+í !X 'Fß#óFk •+?' '' Û

[Ô<¼ •

TYPE <Union #ô> •

UNION

<#¿a¶+Š$11>

...

<#¿a¶+Š$1n>

END_UNION

END_TYPE

Rê r •

4.3.2.5 "–`•<Ãe" øe´4´5øZ²4Ì

do+à ô#ó#¿a¶Lb'r •' Iò.v=ìfK Ú ò_d õ' N¦Ný_x!]5W ##¿"ý!] òXO[Û5õ

E•2e"Ì1%W !f	VAR	VAR Retain	VAR Retain Persistent
Reset Warm	|	”	”
Reset Cold	|	|	”
Reset Origin	|	|	|
Download	|	|	”
Online Change	”	”	”

” 5W # Ä2è

| =ìfK !fÝ

4.4 2e ô%&"]BÄ

4.4.1 ,£ oÑTask oÒ

-Ì C ‹ Task Œ' 3Ž" &O 6 E 7L3Ž" õ2NX3Ìò.vN«N®#<!* ‹ POU Œ•E 2 #Ö ÌQÑX3[¥+• Task #ôI× • ÿ!/7* $sYÍ#¸7H Ý •Task #Ö Ì fE 5ÝeÛ ‹cyclic -interval •freewheeling Œ1ýOì" E !l`Ï õ(ý`ÏFk Event C !2NX3YÍ#¸ 7H Ý Û

;¶ ç Task !l#Ö Ì"ì$ ç 1ý) POU•Oó Task 2NX3Fk!/#õha.v •' 6 „AN2'[¥+•Fk-Ì C7H Ý õ!] ÿ!/ 7*2'!š+• • F#Ö Ì !;¶ ç Task [¥+•!] Watchdog 5ÝeÛ Û

-Ì C ‹Task Œ2NX3ha.v7H Ý •

- z Task 2'[¥+•FkYÍ#¸7H Ý1÷J²
- z)i) Task FkYÍ#¸7H Ý#ó5Ý1÷J² •" „AN2'[¥+•Fk ÿ!/7*Fkj¿ 57L •j¿ ÿ!/7*Fk Task ÿ!/2NX3 Û
- z)i) Task #ó5Ý1÷J² û ÿ!/7*FmFß#ó5Ý •" YÍ#¸7H Ý6ç!/1÷J²Fk Task ÿ!/2NX3 Û
- z)ih`FÕ!l õ fE Fk!ä.ö.z ‹ Library Œ!l6ðFß#ó$d#ôFkPOU •" 2NX3h`FÕ!lFk POU Û

<Ï •Task ÿ!/7*[¥+• #]q 5 • ÊXO ÿ!/7*]qj¿ •#Ö!í" [¥+• ! 0 ~ 31 Û

3Ž" &O-Ì CLb'r#Ö!í1÷ {l´ •

1. Cyclic Task
2. Event Task
3. External Task
4. Freewheeling Task
5. Status Task

4.4.1.1 ,£ oÑTask oÒK9&I

#ëLb'r â"^[Û5õ)i ò

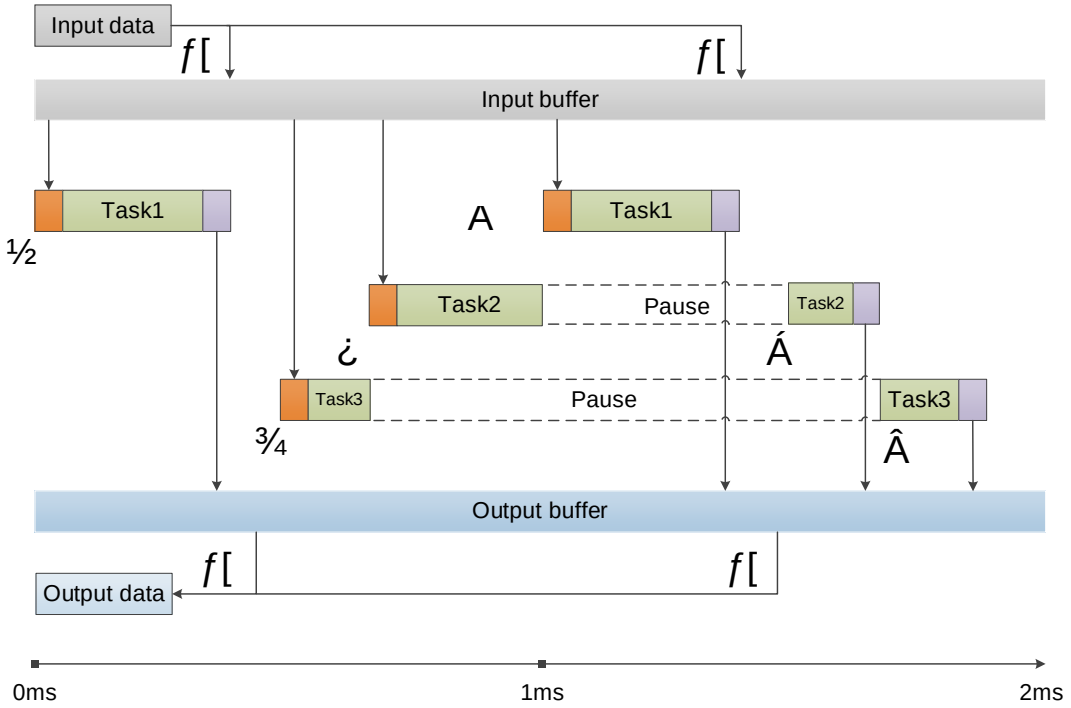
- z Cyclic Task
  $O7 0 2NX3Task •!]2NX3$O7 6 „AN Task !l2'[¥+•Fk Interval #©5W5ÝeÛ2'!š+• Û
- z Event Task *1
  /: Event Task !l2'+• 0Fk Event YÍ#¸#¿a¶ ! ñ#.<¦5Ý •" 2NX3;K Event Task Û
- z External Task
  /:2'[¥+•Fk "7!!l.á Input @ ! ñ#.<¦5Ý •" 2NX3;K Task ç; Û
- z Freewheel ing Task
  /:3Ž" &O.ç)²_·X35Ý •" Freewheeling Task #Z.ç)²2NX3 •Oó û3Ž" &O _ÅNÔFka´(ô2NX3;KTask •FÛ" 3Ž " &O C;I_·X3 !;I Û
- z Status Task
  /: Status Task !l2'+• 0Fk Event YÍ#¸#¿a¶ ! åON æ5Ý •" 2NX3;K Status Task Û

<Ï •Event YÍ#¸#¿a¶/¬hb !-ê+û#¿a¶ Û

4.4.1.2 'Ø,£ oÑ Task oÒ1%W

#ë â"^ 2eÛ2NX3Fk ÿ!/NŽ •6 „AN#ë â"^2'[¥+• ÿ!/7*Fkj¿ 5 • ÿ!/7*ha.v#Ö Ì[¥+• 0 " 31 ‹0 XOI!6çj¿ ÿ!/NŽ • 31 ÊXO6ç 5 ÿ!/NŽ ŒÛ

'Ø,£ 1%W Ö Me



Task 1 • ÿ!/7*[¥+• 1 • Bus cycle Task •Cyclic Task Û

Task 2 • ÿ!/7*[¥+• 3 • Event Task Û

Task 3 • ÿ!/7*[¥+• 5 •Freewheeling Task Û

•Task 1 2NX37H Ý1÷J² •.ç)²2NX3Task 1 Û

•Task 1 2NX3+s;¼ •;K5Ý +í Input/output buffer 5W3U6Û5—HQÚ`: •Task 3 2NX37H Ý1÷J² •.ç)²2NX3Task 3 Û

•Task 2 2NX37H Ý1÷J² •Oó ûTask 2 ÿ!/7*_j Task 3 j¿ •&Ç;K Task 3 6i C2NX3 •Task 2 .ç)²2NX3 Û

•Task 1 2NX37H Ý1÷J² •Oó ûTask 1 ÿ!/7*_j Task2 j¿ •&Ç;K Task 2 6i C2NX3 •Task 1 .ç)²2NX3 Û

•Task 1 2NX3+s;¼ •;K5Ý +í Input/output buffer 5W3U6Û5—HQÚ`: •Task 2 a´5—.ç)²2NX3 Û

•Task 2 2NX3+s;¼ •Task 3a´5—.ç)²2NX3 Û

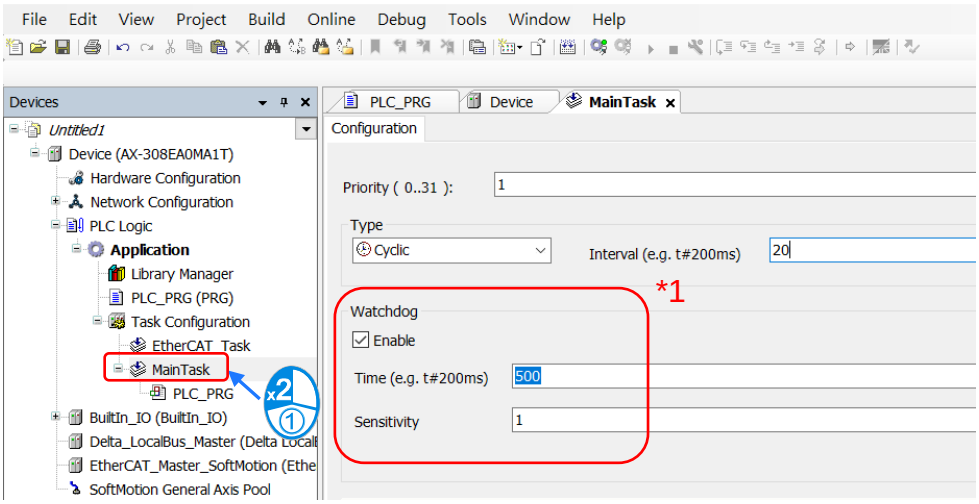
ƒ[2P,<: '> • "7!2'a4OUFk 2P,<: '> •" „AN2'[¥+•Fk Fresh time $O7 5ÝeÛ •+íInput data 5W3Ù+…f,_z!L5W3U Œ6Û5—HQÚt buffer •.]+í Output buffer 5W3U6Û5—QÚtput data ‹+…f,_z!á ŒÛ Component •#ë Component ‹)i ethernet ÚEtherCAT… Œ" „AN!][¥+•Fk Bus cycle Task •/l Bus cycle Task 2NX3+s;¼#õ#Z+Íput data 5W3U6Û5—HQÚt buffe]í Output buffer 5W3U6Û5—QÚtput data Û

<Ï •2P,<: '> Fresh time [Þ#©OêK4.2.2 Ri å2P,<: '>#©5W[¥+• æ

4.4.1.3 Watchdog

/: Task [¥+•!l Watchdog E 5/ •" /: Task 2NX3]l_®Watchdog 2'[¥+•Fk5ÝeÛ5Ý •" 3Ž" &O ŽE e [Ö[—/<.] C;I2NX3 Û

Watchdog "í!f4w-Íoã



<Ï 1 •Task FkWatchdog 5ÝeÛ[ˆK~5 .ö)i ò

Sensitivity ! 0 5Ý •Watchdog 5ÝeÛ ! Time * 1 Û

Sensitivity ! n 5Ý •Watchdog 5ÝeÛ ! Time * n Û

4.4.1.4 :•H‹ ¹!_K9&I"- £1%W EB^Ž!f2e ô1Å ¢

do+àAX Lâ!þ"†Pä'> •fç fE ' <I´ â"ˆLb'r ²N´)i ò •

z #ó;L_[

H‹K9	1Å ¢"ËH®	¹!_K9&I		
		Cycli c	Freewheeling	Bus Cycle EtherCAT
	MC_Home			V
	MC_Stop			V
	MC_Halt			V
	MC_MoveAbsolute			V
	MC_MoveRelative			V
_˙	MC_MoveAdditive			V
"•	MC_MoveSuperImposed			V
"†	MC_CamIn			V
	MC_CamOut			V
Pä	MC_MoveVelocity			V
'>	MC_PositionProfile			V
	MC_VelocityProfile			V
	MC_AccelerationProfile			V
	MC_Jog			V
	MC_GearIn			V
	MC_GearOut			V

H‹K9	1Å ¢"ËH®	¹!_K9&I		
		Cycli c	Freewheeling	Bus Cycle EtherCAT
	MC_GearInPos			V
	MC_Phasing			V
	DMC_TorqueControl			V
	DMC_VelocityControl			V
	DMC_MoveLinearAbsolute			V
	DMC_MoveLinearRelative			V
	DMC_MoveCircularAbsolute			V
	DMC_MoveCircularRelative			V
	DMC_GroupStop			V
	DMC_GroupHalt			V
	DMC_Home_P			V
	DMC_GroupInterrupt			V
	DMC_GroupContinue			V
	DMC_ImmediateStop_P			V
	MC_Power	V	V	V
	MC_SetPosition	V	V	V
	MC_ReadParameter	V	V	V
	MC_WriteParameter	V	V	V
	MC_ReadBoolParameter	V	V	V
	MC_WriteBoolParameter	V	V	V
	MC_ReadActualPosition	V	V	V
	MC_ReadActualVelocity	V	V	V
	MC_ReadActualTorque	V	V	V
	MC_Reset	V	V	V
	MC_ReadStatus	V	V	V
	MC_ReadAxisError	V	V	V
	MC_CamTableSelect	V	V	V
Kˆ	MC_TouchProbe	V	V	V
Cí	MC_AbortTrigger	V	V	V
2î	MC_DigitalCamSwitch	V	V	V
Ë	DMC_GroupEnable	V	V	V
	DMC_GroupDisable	V	V	V
	DMC_GroupReadStatus	V	V	V
	DMC_GroupReadError	V	V	V
	DMC_GroupReset	V	V	V
	DMC_CamReadTappetStatus	V	V	V
	DMC_CamReadTappetValue	V	V	V
	DMC_CamWriteTappetValue	V	V	V
	DMC_CamAddTappet	V	V	V
	DMC_CamDeleteTappet	V	V	V
	DMC_CamReadPoint	V	V	V
	DMC_CamWritePoint	V	V	V
	DMC_ChangeMechanismGearRation	V	V	V
	DMC_ReadMotionState	V	V	V
	DMC_GroupReadParameter	V	V	V
	DMC_GroupWriteParameter	V	V	V

<Ï •.á[•_·"•"†Pä'>5%OU' Bus Cycle EtherCAT • Ì!4+ãQÛ_·"• ô_ÅNÔ Û

z +• 4^ß

H‹K9	1Å ¢"ËH®	¹!_K9&I		
		Cyclic	Freewheeling	Bus Cycle EtherCAT
_·"•"†Pä¨>	MC_Halt_DML	V	V	V
	MC_Home_DML	V	V	V
	MC_MoveAbsolute_DML	V	V	V
	MC_MoveRelative_DML	V	V	V
	MC_MoveVelocity_DML	V	V	V
	MC_Stop_DML	V	V	V
KˆCí2î Ê	MC_Power_DML	V	V	V
	MC_ReadBoolParameter_DML	V	V	V
	MC_ReadParameter_DML	V	V	V
	MC_ReadStatus_DML	V	V	V
	MC_Reset_DML	V	V	V
	MC_WriteBoolParameter_DML	V	V	V
	MC_WriteBoolParameter_DML	V	V	V
	MC_ChangeAxisConfig_DML	V	V	V
	MC_ReinitDrive_DML	V	V	V
	MC_SetOpmode_DML	V	V	V
	MC_StartupDrive_DML	V	V	V

MEMO

5

Iê5 Iž Hardware Configuration

E¬.

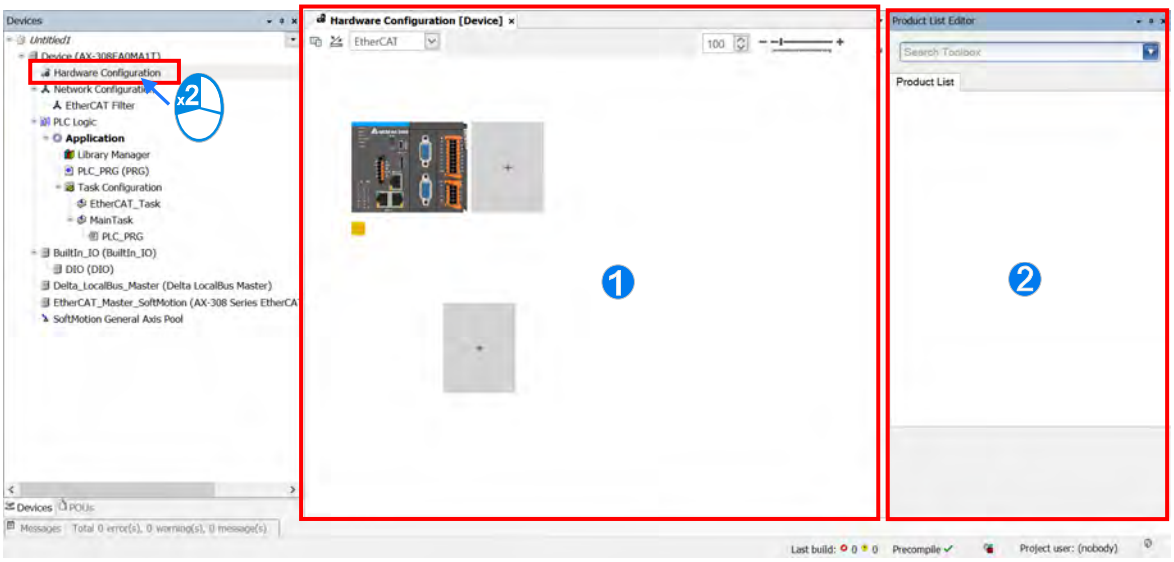
5.1 Hardware Configuration 5-2
5.1.1 C–(j ²N´ 5-2
5.1.2 5—(…: '>.....5-5
5.1.3 " fK: '> 5-7
5.1.4 : '>Fk(ô" /] ñ 5-9
5.1.5 : '>Fk"Q ò/] ñ 5- 11

5.1 Hardware Configuration

Hardware Configuration ! DIADesigner-AX 2'3· ,FkHS ÝY«!ù_l"•-Ì!^ •]"†Pä"ì2Ó CPU "7! õ: '>Fk #©5W[¥+• •7 JÇRi !/ ²N´Fß!Z"†PäFk[¥+•5 .ö Û

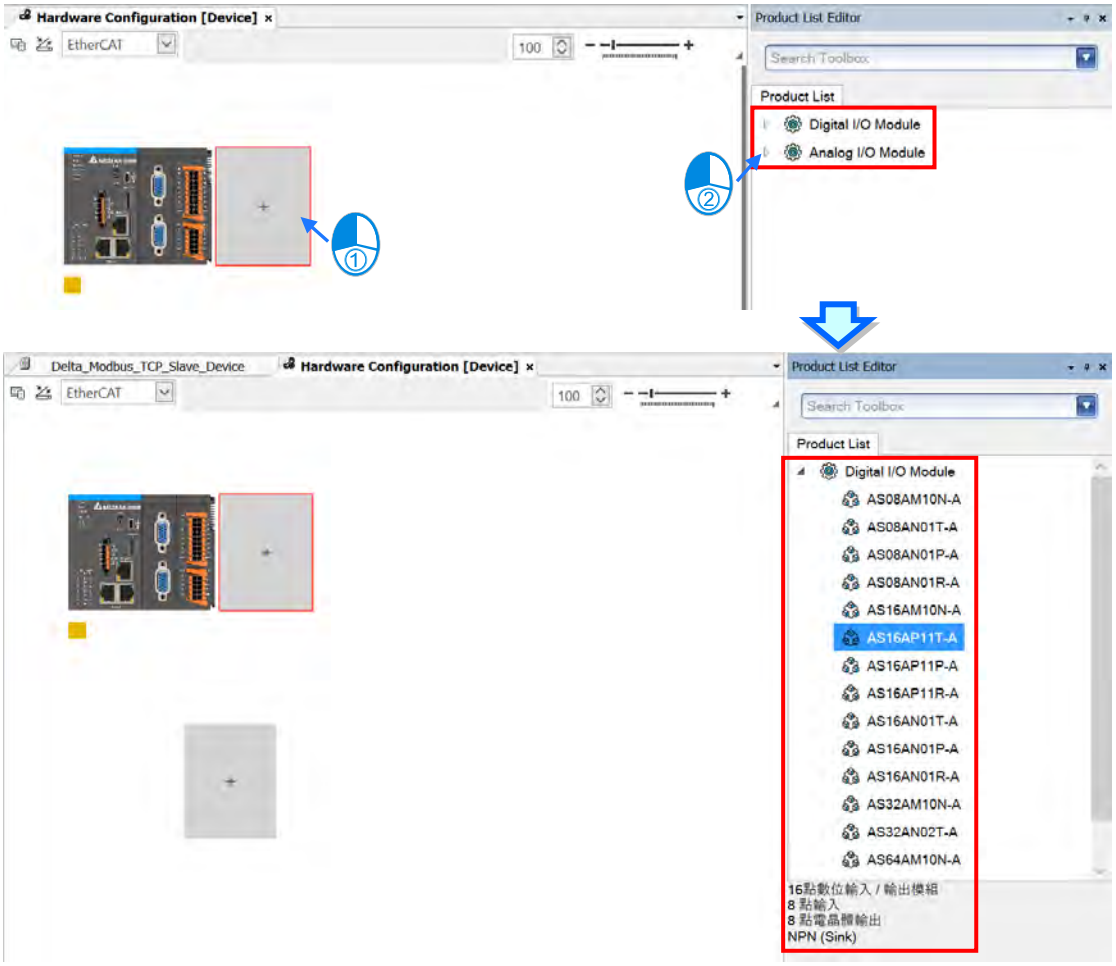
5.1.1 Bm'A ‰M‹

' -Í Ž Devices J~#Ê • fE o 7î-Íe #³!â •Hardware Configuration [Device] _ðh`!íh\J~#Ê ' [¥(î!þ#Ú Ž2:.ç •)i ò&å2'I! Û

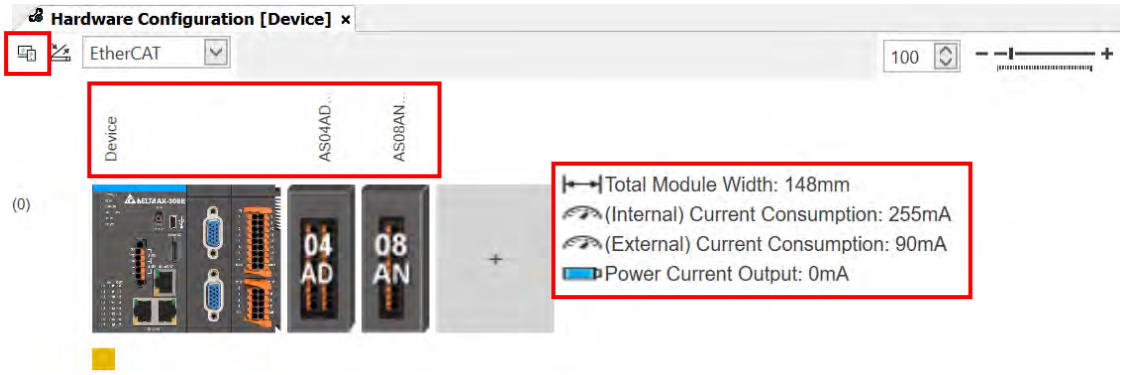


1. LâNÆa4OU#! • ! "YhFk-Ì C#! •E 2 #Ö' ;K(ë_ÂX35[LâNÆFka4OU õ[¥+• Û
2. Ž$¨!þXO •;K#! ÌFÕ/<KˆCíFk5 .ö$/C—2'6ð#ÖE FkHS Ý]+>w Û

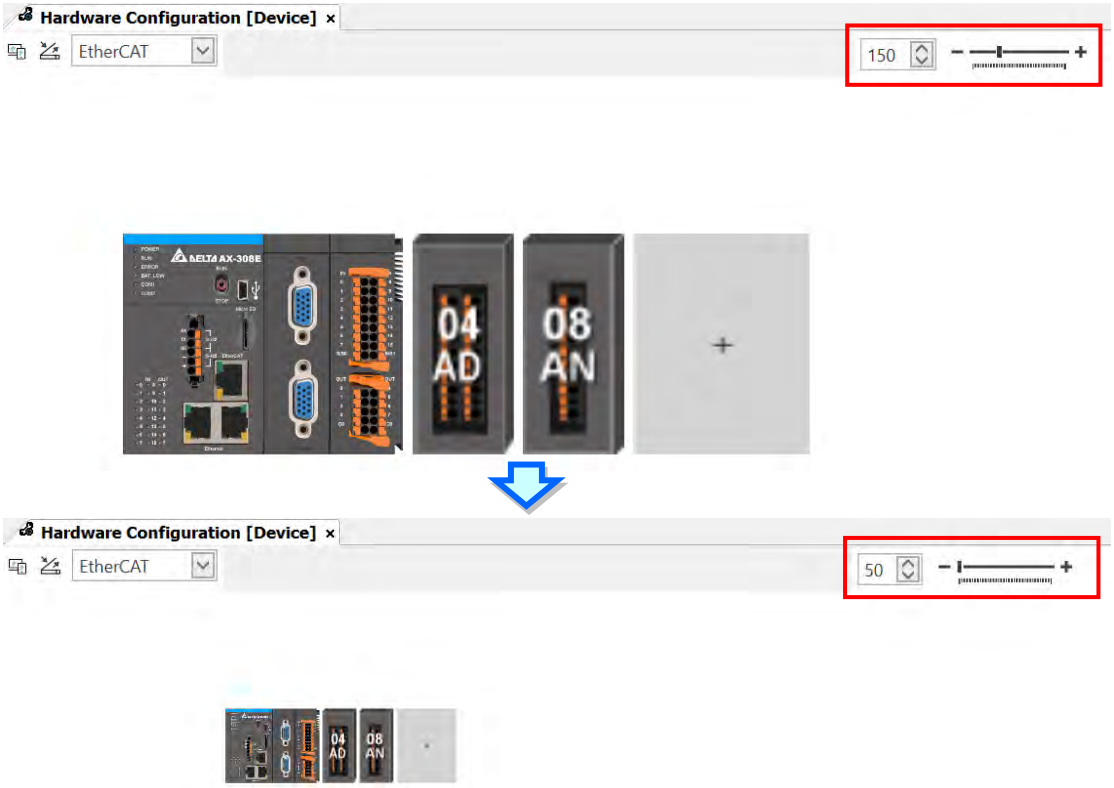
#<!â "7!#Ú Ž "+"#Þ&å7î •' #Ú Ž Ž$¨!þXO !áC—#ÖE Fk: '>Lb'r •!t#<!â &å7î#õ /g ò,<.ç#Ö fE : '>Fk7!l´#ôI× •RÌ!t' [Ì7!l´#ôI× ñ#<!â#<!â • ò5 6ðKg5úFk: '>[Û5õ Û



o 7î-Íe #<!â!íh\-Í ñY¹&åI! #õ •' LâNÆa4OU#!!I 6%I!FÕ"4a4OUFkFß!Z È0V •)i#ë5—(…: '>#ôI× Ú LâNÆ7!(Ú0"+¤.•$sLâNÆ=oOþE =(a¶K0 Û

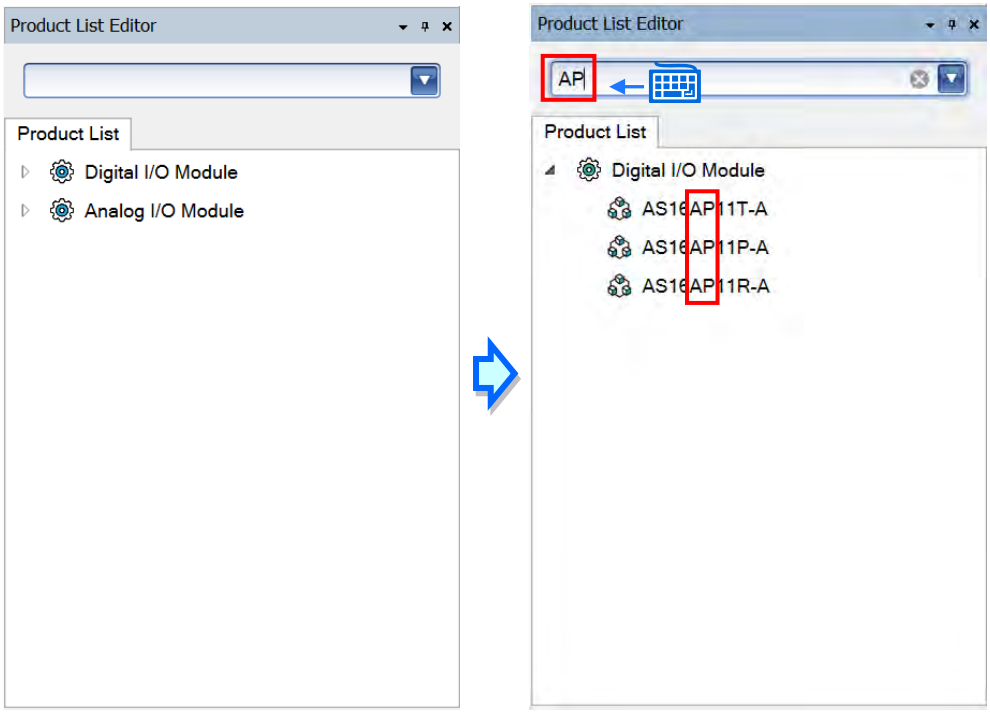


' !íh\#Ú ñY¹5W #[ê5[õ+/ --Í#Ú: 2°+à\H)i ò&åN‰8-(ë • _®5W #[ê) ‹/g +5 #ø Œ1ý5W #[ê+ö‹/g-5ŒE #Ö Ì5 #¿LâNÆa4OU#!!IFk&å7î#¿) 1ý#¿+ö •5 ¦E 2 Y©FòFÕ"4LâNÆ5[:a4OU Û



5

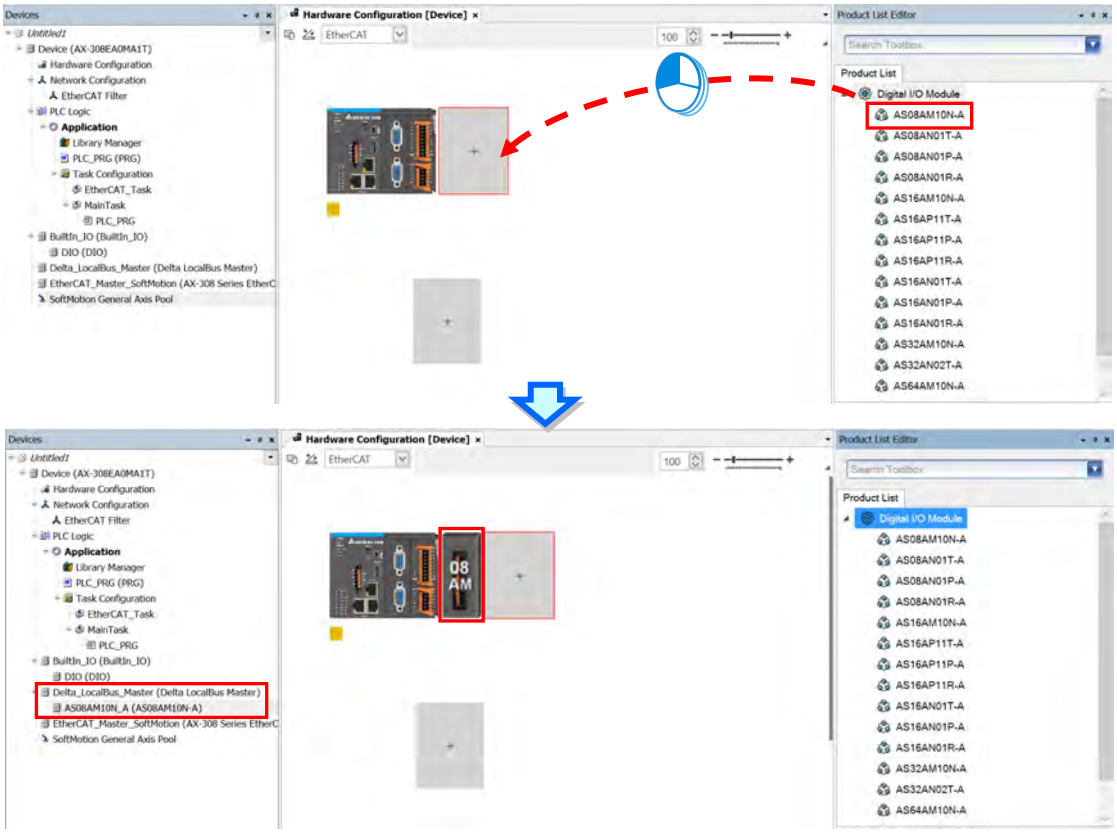
' #Ú Ž Ž$¨!þXONý_xJ~#Ê ñ5 Fk åSearch Toolbox æ_z‼L; 4 M Fk!Ze [´#õ2ð ò Enter •ò5 !þXO#Z 6%I! #ôI×!l6ð+s!OFß#ó_ÅNÔ+>K Fk: '>h`FÕ Û



5.1.2 4n'\8ß&

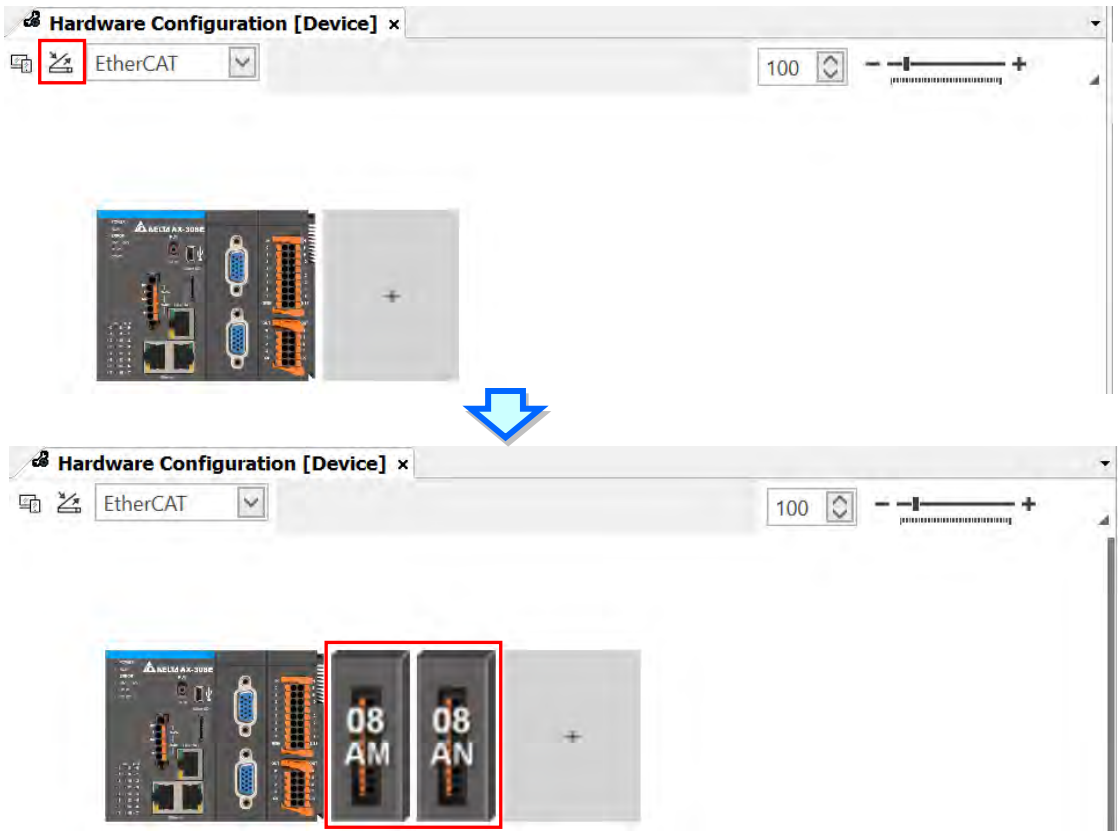
z 5 <¼ ç

AX-3 Lâ!þ7!I´ !5ÇP³7f[¥[ˆ • 2P,<: '>#ÑPä+pX¬QÚ#Ú ŽFk+pX¬ 4OU •22"•5—(…: '>#õ+pX¬ 4OU+í NÎNÔ!á C—' 6ç#Ú Ž ,E 2 „.v3¹!L#Ú Ž: '> • û' #ó5ÝeÛ5—(…Fk: '> F QÑ"•5—(…' -Í Ž[¥(î!þ å LocalBus æ ò5 Û



z 5 <¼ s

RÌ "7! õ-Ù3¹!LFk2P,<: '>6 ñE Fk0¬!œ ò •û Gateway [¥+•-ÙN¶;J. P;7! ò ‹#Ö` _®2ð ò!íh\-Í ñY¹Fk 2ðd•&å7î •7LQÑ"•2R3¶#õ5—(…: '>a4OU •#ó8 5—(…Fk: '> F QÑ"•5—(…' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ò5 Û

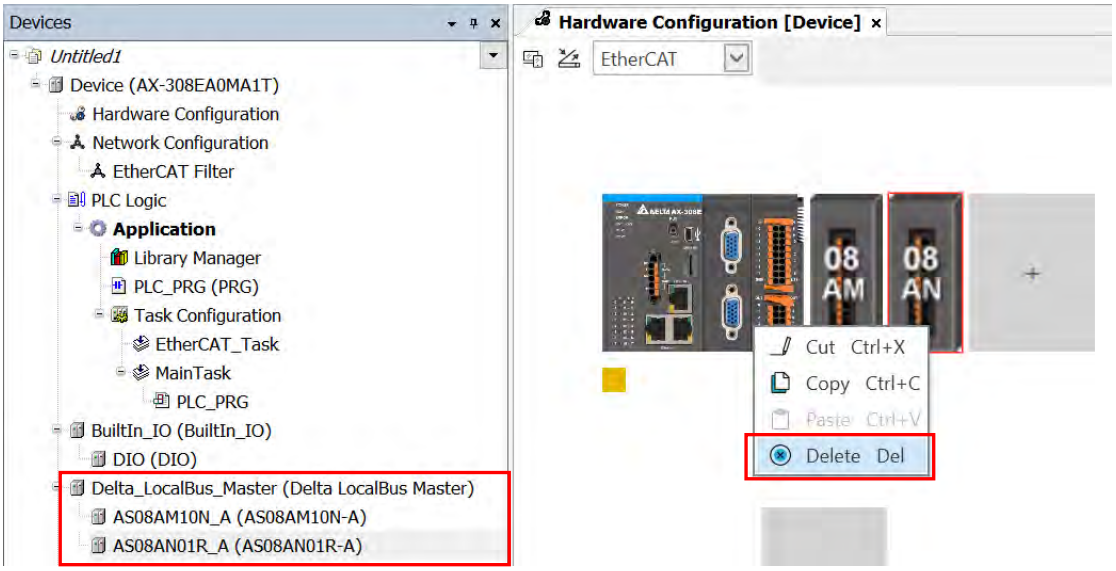


5.1.3 Þe"8ß&

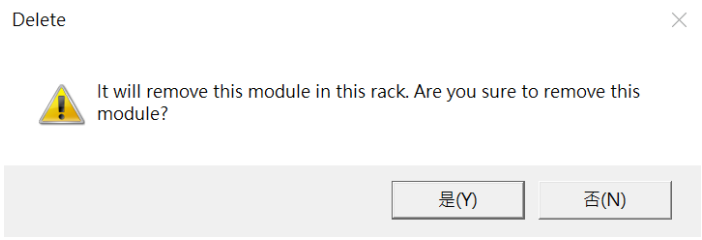
" fK-Ùa4OU: '>Fk5 <¼6ð ò!þ l´ ‹ CPU "7! ô#Ö" fK Œ•

z 5 <¼ ç

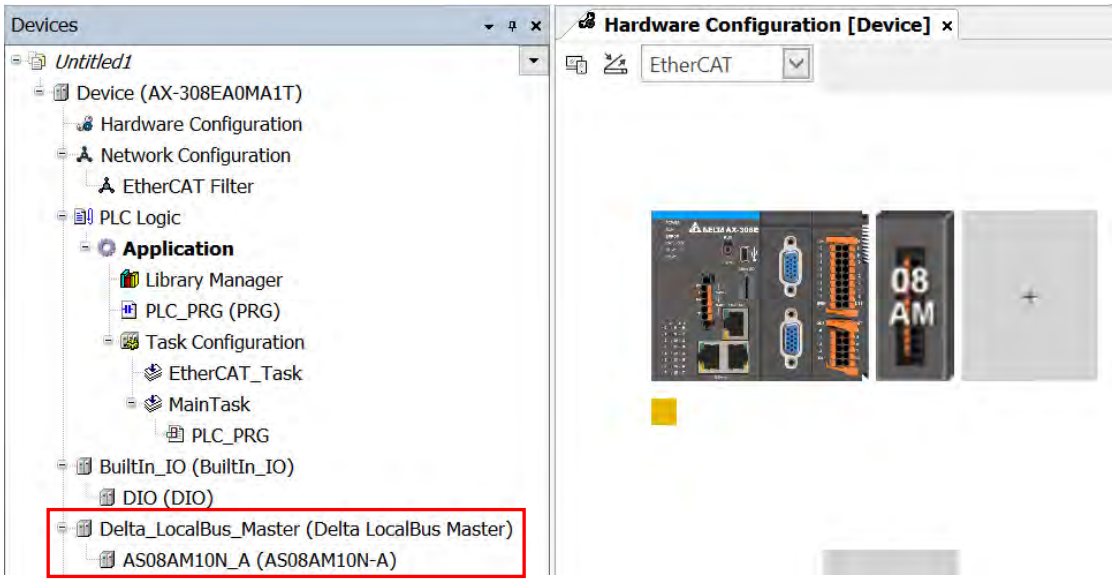
!/' LâNÆa4OU##<!â; " fKFk: '> •2ð òo 7î#Úe #õ' /Ò3^_ð#< #<!â åDelete æ•1ý6 FÛ3Œ2ð òe F¿Fk éDEL êe Û



2ð ò#õ]Ú!á È0V8-HU[‹6 $ lâfK: '> •;K5Ý!t2ð ò å6 ‹Y Œæ#Z#ÖlâfK Û

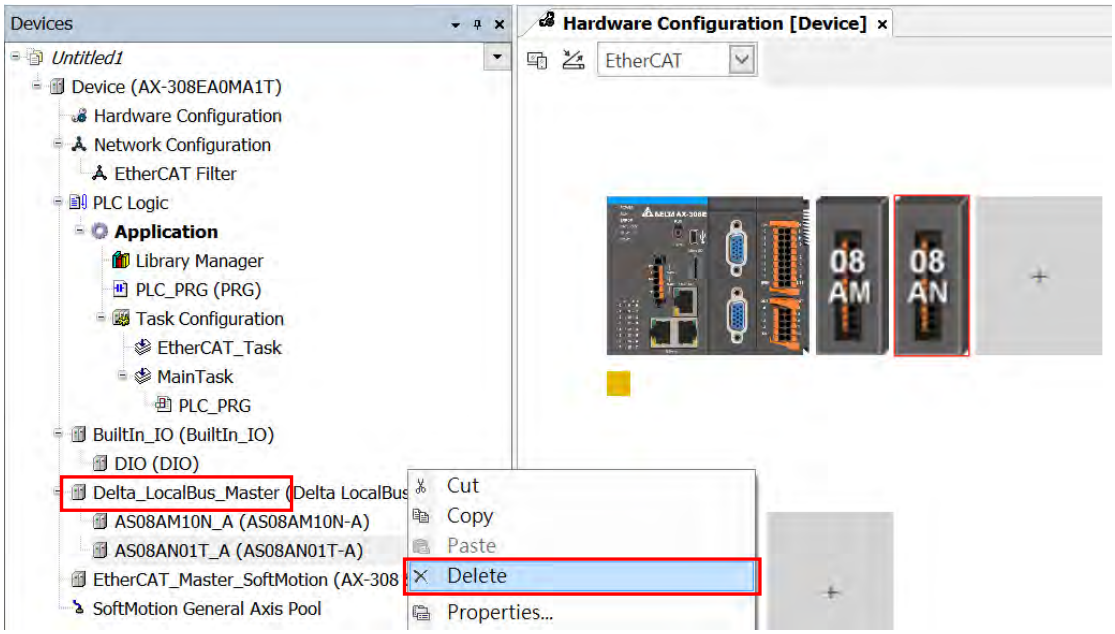


' #ó5ÝeÛ" fKFk: '> F QÑ"•X'IâfK' -Í Ž[¥(î!þ åLocalBus æ ò5 Û



z 5 <¼ s

' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ò5 #<!â ; " fKFk: '> •2ð òo 7î#Úe #õ' /Ò3^_ð#< #<!â åDelete æ#Z#Ö •' #ó5ÝeÛ" fKFk: '> F QÑ"•X'IâfK' LâNÆa4OU#!!l&å7î Û

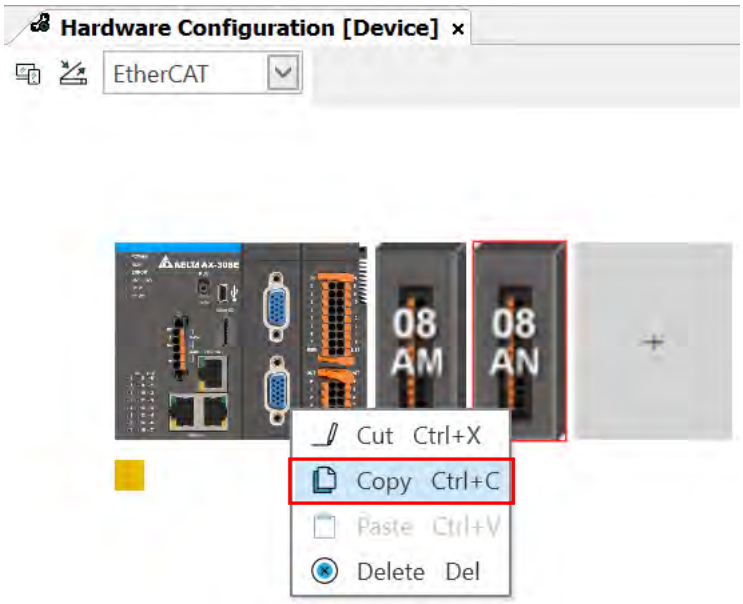


5.1.4 8ß& EB'Ë ô/[ò È

(ô" : '>Fk5 <¼6ð ò!þ I´ ‹CPU "7! ô#Ö_ÂX3(ô" /] ñ4´ C Œ•

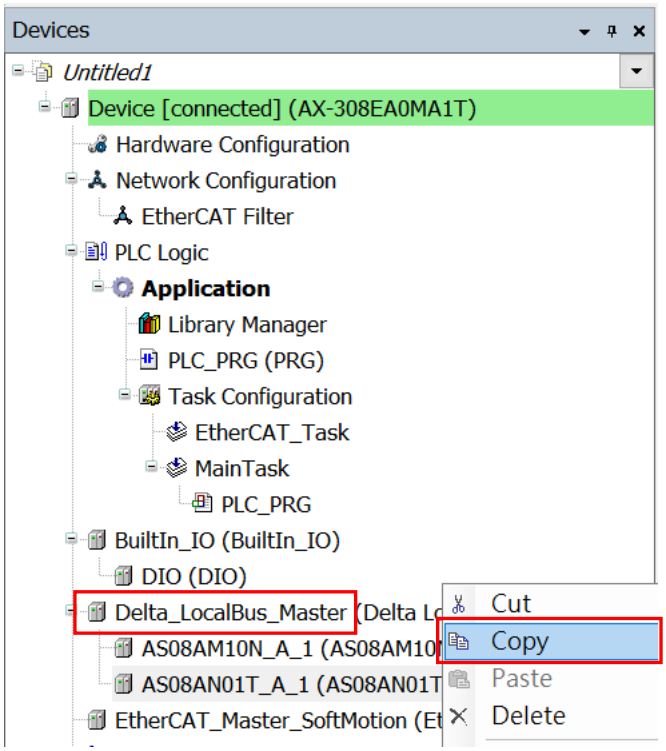
z 5 <¼ ç

' LâNÆa4OU#!#<!â; (ô" Fk: '>#õ2ð òo 7î#Úe •!t' /Ò3^_ð#< #<!â åCopyæ



z 5 <¼ s

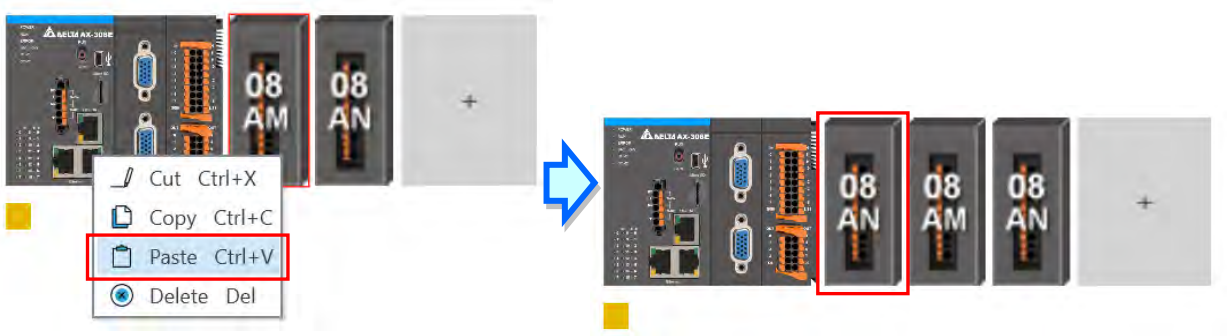
' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ò5 #<!â ; (ô" Fk: '>#õ2ð òo 7î#Úe •!t' /Ò3^_ð#< #<!â åCopyæ



] ñ: '>Fk5 .ö6ð ò!þ l´ •

z 5 <¼ ç

' LâNÆa4OU#!#<!â;] ñFk 4OU#õ2ð òo 7î#Úe • 2#õ' /Ò3^_ð#< #<!â åPaste æ•Rì;] ñFk 4OU-Ù6ð : '> •#†6ðFk: '> /g#Úhalâ ç 4OU žRì] ñFk 4OU !&å7îå + æ#ÞFk 4OU •: '>"] ' LâNÆ6ç#Ú5 Fk 4OU Û



#ó8 5—] ñFk: '> F „ha.vQÑ"•5—(…' -Í Ž[¥(î!þ å Delta_LocalBus_Master æ ò5 Û

5

z 5 <¼ s

' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ñ1ý ò5 : '>#<!â;] ñFk 4OU#õ2ð òo 7î#Úe • 2#õ' /Ò3^_ð#< #<!â åPaste æ•Rì;] ñFk 4OU6 ' C—6ðFk: '> ñ •#†6ðFk: '> /g òhalâ ç 4OU žRì#<!â] ñFk 4OU ! åDelta_LocalBus_Master æ•: '>"] ' !þXO6ç ò5 Fk 4OU Û

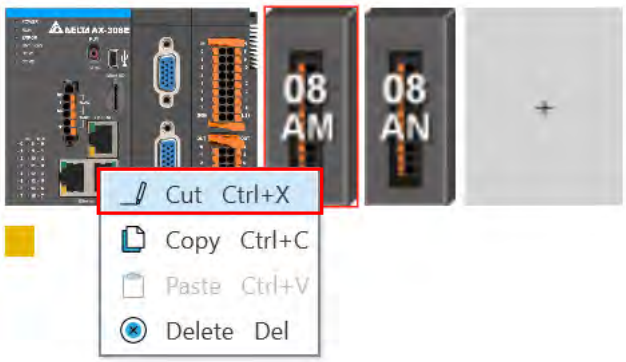
#ó8 5—] ñFk: '> F „ha.vQÑ"•5—(…' LâNÆa4OU#! Û

5.1.5 8ß& EB!(É/[ò È

"Q ò: '>Fk5 <¼6ð ò!þ I´ ‹CPU "7! ô#Ö_ÂX3"Q ò/] ñ4´ C Œ•

z 5 <¼ ç

' LâNÆa4OU#!#<!â; "Q òFk: '>#õ2ð òo 7î#Úe •!t' /Ò3^_ð#< #<!â åCutæ



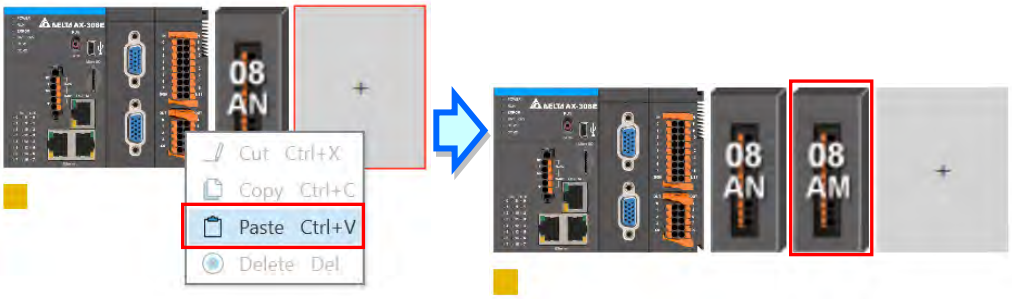
z 5 <¼ s

' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ò5 #<!â ; "Q òFk: '>#õ2ð òo 7î#Úe •!t' /Ò3^_ð#< #<!â åCutæ

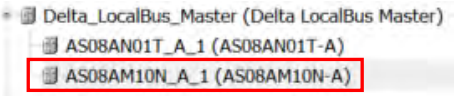
] ñ: '>Fk5 .ö6ð ò!þ I´ •

z 5 <¼ ç

' LâNÆa4OU#!#<!â;] Fk 4OU#õ2ð òo 7î#Úe • 2#õ' /Ò3^_ð#< #<!â åPaste æ•RÌ;] ñFk 4OU-Ù6ð: '> •#†6ðFk: '> /g#ÚhaIâ ç 4OU žRÌ] ñFk 4OU !&å7î å + æ#ÞFk 4OU •: '>"] ' LâNÆ6ç#Ú5 Fk 4OU Û

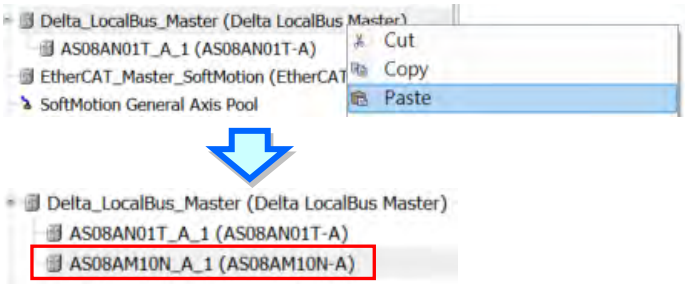


#ó8] ñFk: '> F „5—Fkha.vQÑ"•5—(…' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ò5 Û



z 5 <¼ s

' -Í Ž[¥(î!þ åDelta_LocalBus_Master æ ñ1ý ò5 : '>#<!â;] ñFk 4OU#õ2ð òo 7î#Úe • 2#õ' /Ò3^ _ð#< #<!â å Paste æ•Rì;] ñFk 4OU6 ' C—6ðFk: '> ñ •#†6ðFk: '> /g òhaIâ ç 4OU žRÌ#<!â] ñFk 4 OU ! å Delta_LocalBus_Master æ•: '>"] ' !þXO6ç ò5 Fk 4OU Û



#ó8] ñFk: '> F „5—Fkha.vQÑ"•5—(…' LâNÆa4OU#! Û

6

Iê6 Iž Network Configuration

E¬.

6.1 Network Configuration 6-2

6.1.1 Kg ² 6-2

6.1.2 'áH' ²N´ 6-3

6.1.3 O8NÃ7•7kFka4OU.....6-5

6.1.3.1 a4OURi@.....6-5

6.1.3.2 då3ŒO8NÃ.....6-7

6.1 Network Configuration

Network Configuration ! DIADesigner-AX 2'3· ,FkO8NÃY«!ù_l"•-Ì!^ •"†Pä' uY«!ù5[h`FÕFkO8NÃ7•7k •[ÍN-[Û5õ+í' #õNÔFk!l+ _÷ ç ²N´ Û

6.1.1 J> ‰

Network Configuration !] "Yh]] Fk-Ì C)i ò •

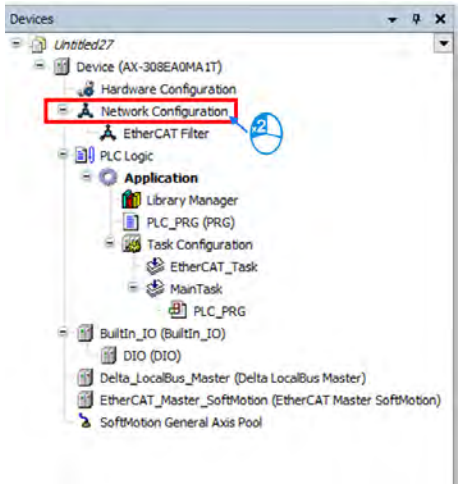
‹ a Œ Y«!ù5[h`FÕFkO8NÃ ŒEtherCAT/MODBUS/Ethernet/CANOpen Œa4OU •.].áJ²5W3UFk _è]Ö/k Û

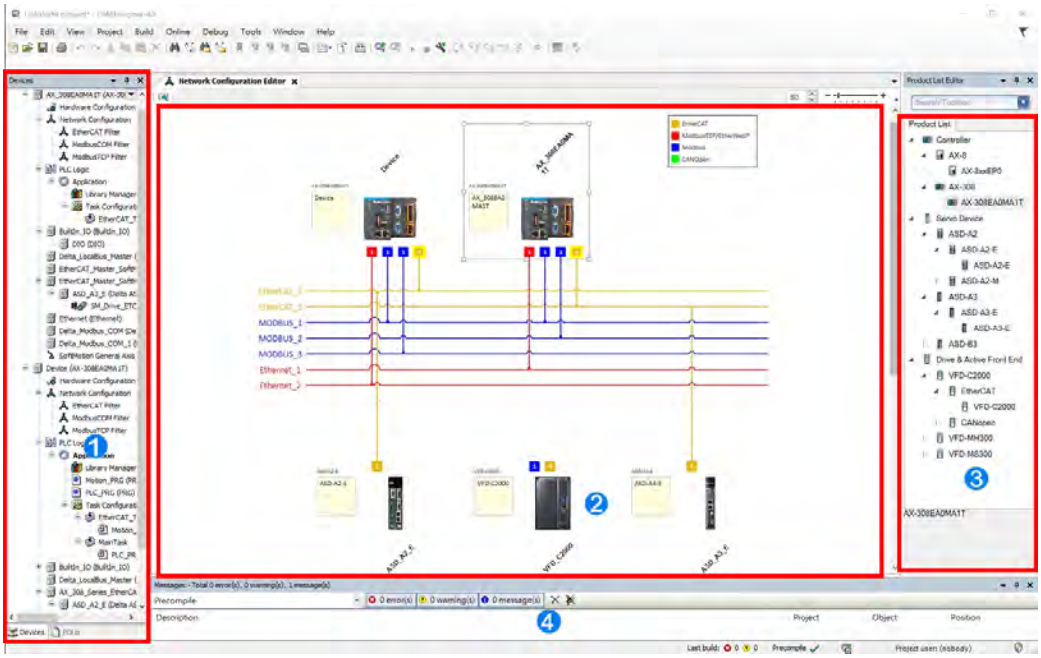
‹ b Œ Y«!ù EtherCAT "JÀFk[¥+• Û

‹ c Œ Y«!ù MODBUS Fk COM port [¥+• Û

‹d Œ Y«!ù Ethernet Fk IP [¥+• Û

Network Configuration Fk+• 4' uY«!ù5[h`FÕFkO8NÃ7•7k • &Ç;K!]2" Fk 4OU ' Device ò,) •Oó; .ç$ Network Configuration 5Ý •[ÞFÛ3Œ' h`FÕ ñ#³!âo 7î-Íe #Z#Ö Û





n Device oã;K#! ÌFÕ/<KˆCí5 .ö$/C—2'6ð-ÙX'a4OU fE FkX¬OU Û

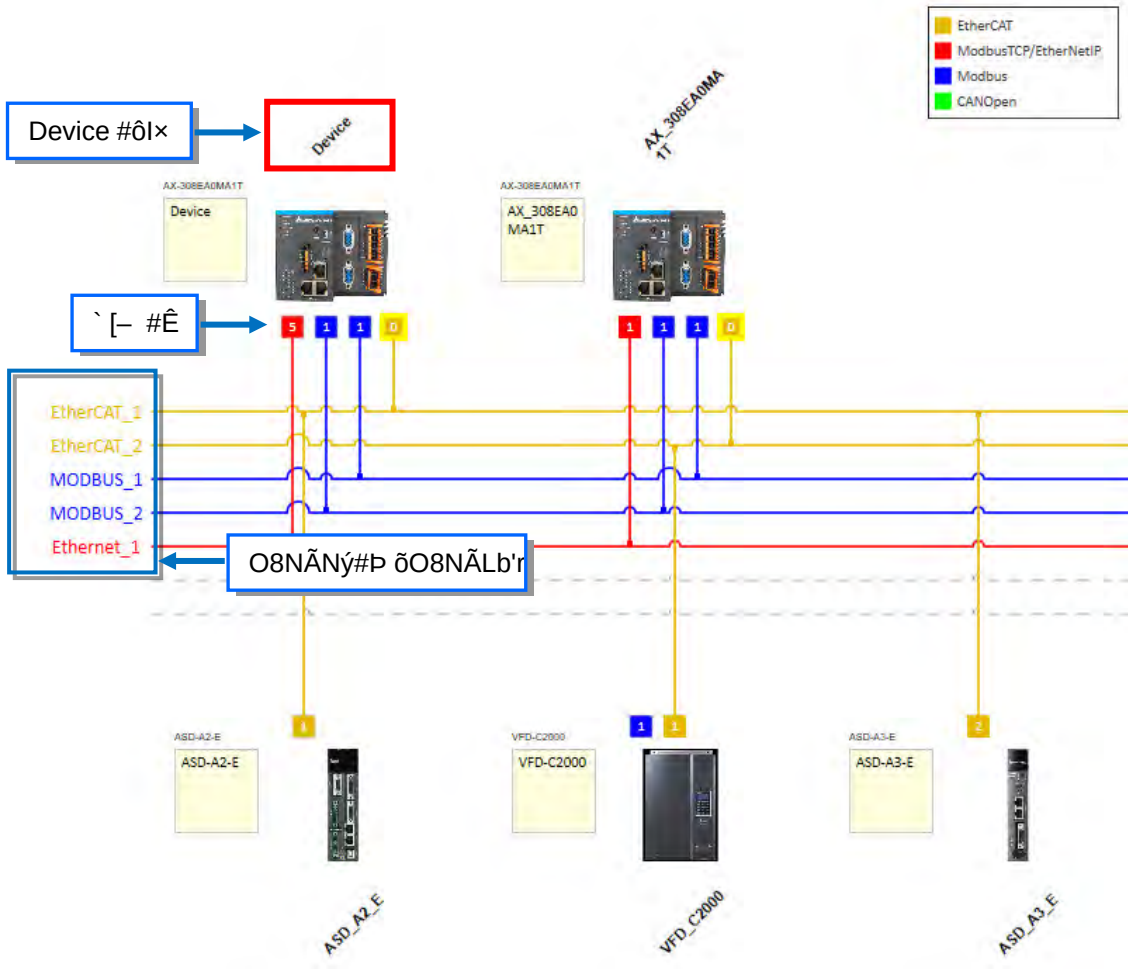
o %¼6Å,£ !øoã! "YhFk-Ì C#! •E 2 #Ö' ;KY«!ù5[O8NÃ7•7k Û

p WƒN, ÕW&¸Fã#! ÌFÕ/<KˆCíFk5 .ö$/C—2'6ð#Ö fE FkX¬OU]+>w Û

q Ÿ/-IU"¡oã ;K(ë 6%I!4´ C_®Iò FkFß!Z È0V Û

6.1.2 &¸Fþ ‰M‹

' .ç)²_ÂX3O8NÃY«!ù 2"4 • do+à4´ C_®Iò2'fç!^(îFk ç ,'áH'[‹GÌ •1ø Ó+í' 7 Ri/: !/"‡ Ì ²N´ Û



z Device ÌN MšK9&I

Device ! Network Configuration 6ç'á7 FkN« Ý •!]2'2îFk#Ö Ì6 3Ž" &O Ú6ô"^&O ÚjX"•&OK0K0 •1ý6 E 2 QÑX3+• 0Fk[¥(î žOó;K(ëFkN MšK9&I" 6 2î_Å3Œ#ë WƒN,FkP;7! • û;¶ ` [–#Ê`ä/¬hb2î+• ç % çFkO8 NÃLb'r •Oó!]Lb'r" 6ð MODBUS ÚEthernet ÚEtherCAT #± CANOpen Û#Í(ý •&Ç#ëX¬OUE Ì_Å3ŒQÚO8NÃFkJÖ @ #Z6 [ÌX¬OUFk` [–#Ê •&Ç;K/: ç X¬OU!^6ð Ì ñFk` [–#Ê5Ý •[ÌX¬OU ¦#Ö#ó5Ý_Å3ŒQÚ ô#óO8NÃ Û

z Device "ËH®

Device #ôI× "YhFk"†Pä6 ' A ! "7!Fk[-" • õ Device 7øB•Nº7k 2#ôI×.{Fß+à.{ •Oó(î<Ï" +à4´ C ñ 5Ç â <Fk0ö 0 Û

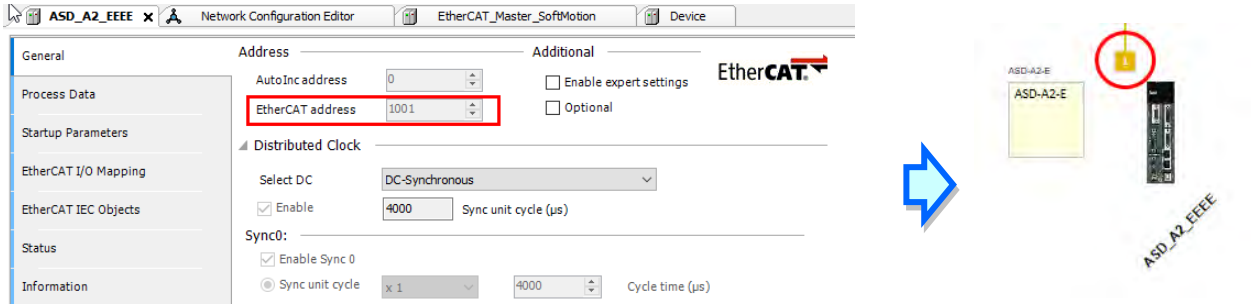
z N MšK9&I Ì^ØZm"¡

„ EtherCAT

' n«RYN¦ ! EtherCAT ` [– •' Ri@ ñ#³!âo 7î-Íe #ÖNý_x EtherCAT [¥+• Û "JÀ#ÞGè6%I! ! 0 ô#Ö #¿"• Û

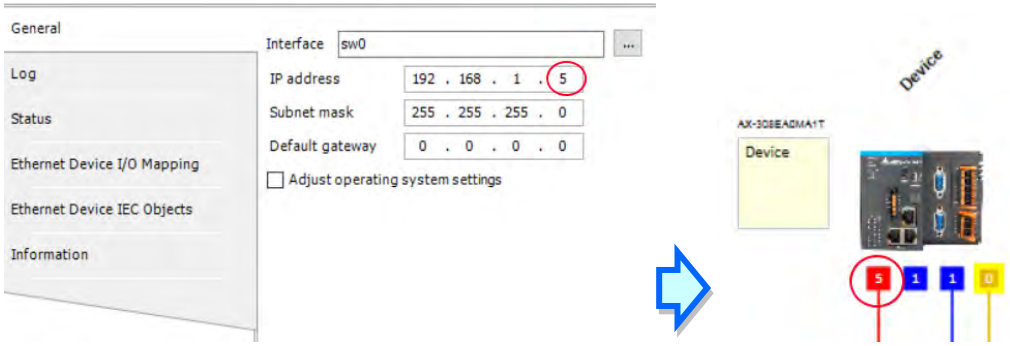
#<!â µJÀRi@ .ç$ µJÀ[¥+•E"gI •EtherCAT address #õNç6%I!Ný#Þ Û

EtherCAT address 1001 Ri@ 6%I!1 Û



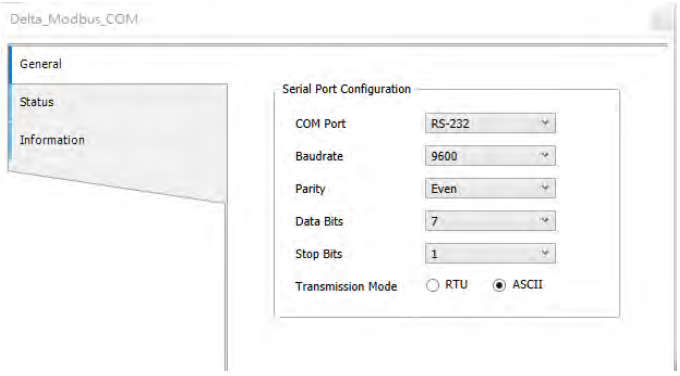
„ MODBUS TCP/EtherNet/IP

N‰RYN¦Ethernet port #Ö Ì ! MODBUS TCP ` [–1ý6 EtherNet/IP ` [– •Ri@ ñ#³!âo 7î-Íe • #ÖNý_xP Address ÛRi@ 6%I!IP Address K &ÂGè Û



„ MODBUS

TÄRYN¦ !MODBUS `[< RS-232/RS-485 Œ Ri@ ñ #³!âo 7î-Íe #Ö_Â!L COM port [¥+•E"gI Û

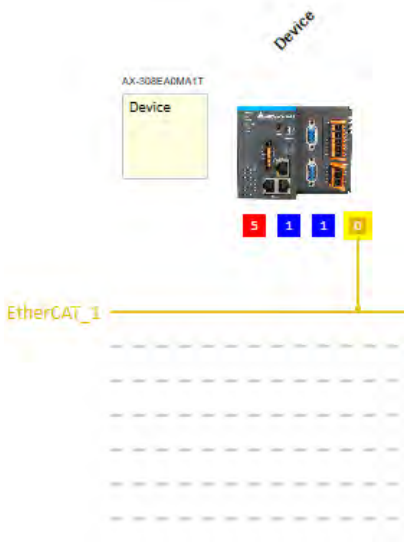


6

6.1.3 N Mš6t6BEB` N,

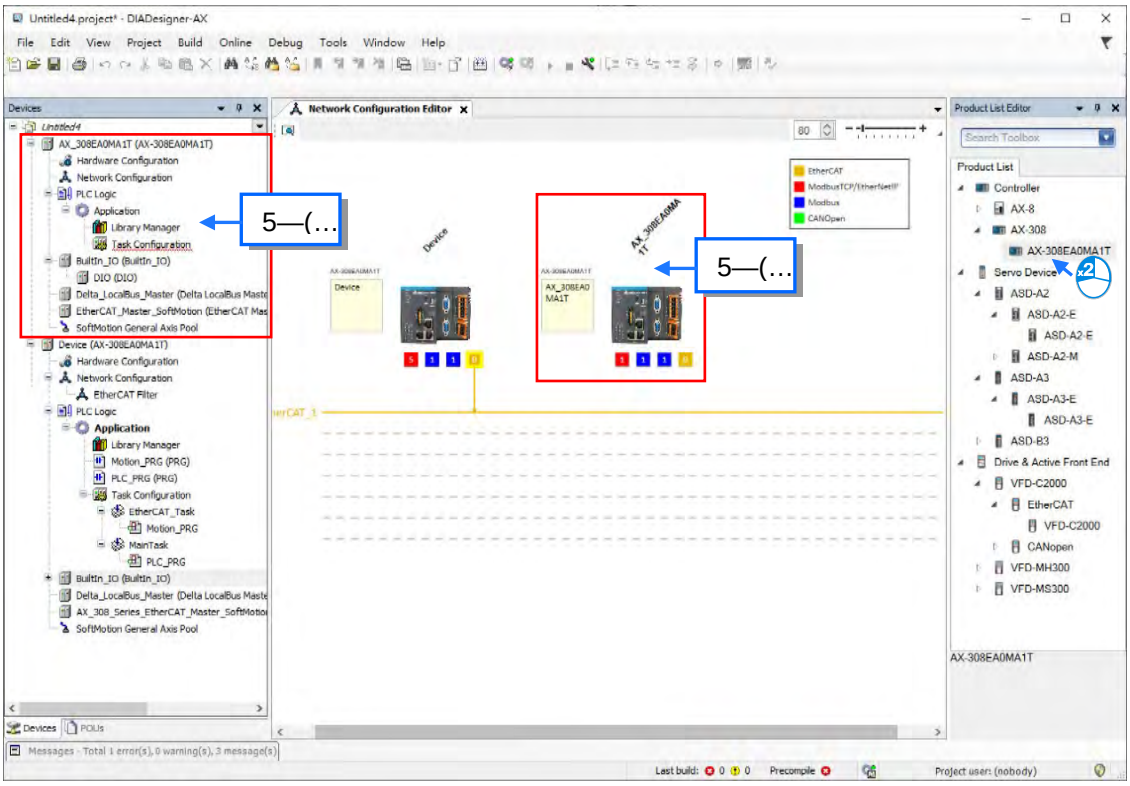
6.1.3.1 ` N,Q@?w

i}; .ç$ h`FÕ Fk Network Configuration 5Ý •LâNÆ „3Uh`FÕ 2'.áJ²Fk7!l´ •QÑ"•a4OU' -Ì C#! Û



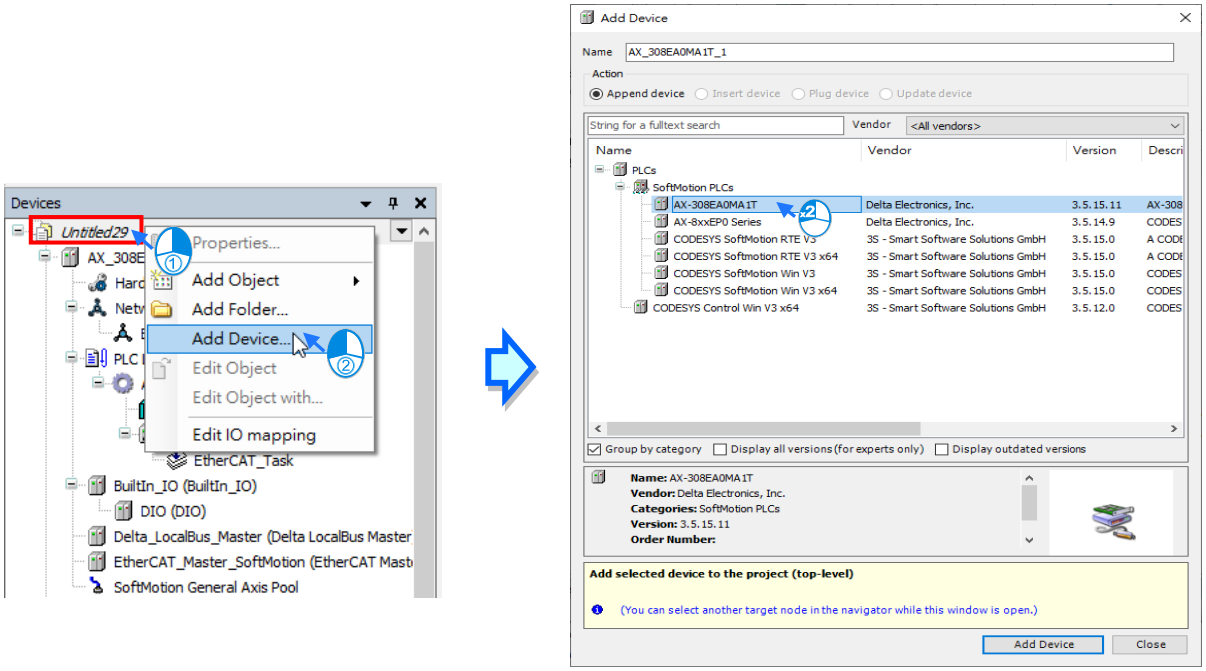
E 2 #Ö#Í(ý"‡!L!]+j3Ž" &O Ú6ô"^&O ÚjX"•&O1ý!]+j X¬OU •Oó"‡!L5—X¬OUFk5 <¼!X6ð ò!þ ðl´ Û z 5 <¼ ç

OU u#Ú ŽProduct List Editor •_ð2Ð; 5—(…Fk "7!1ýX¬OU'r#Þ#õ •' [Ìh`FÕ ñ#³!âo 7î-Íe •!]5—(…X¬OU, X'5—(…" -Ì C#!#± Devices 7øB•Nº7k Û



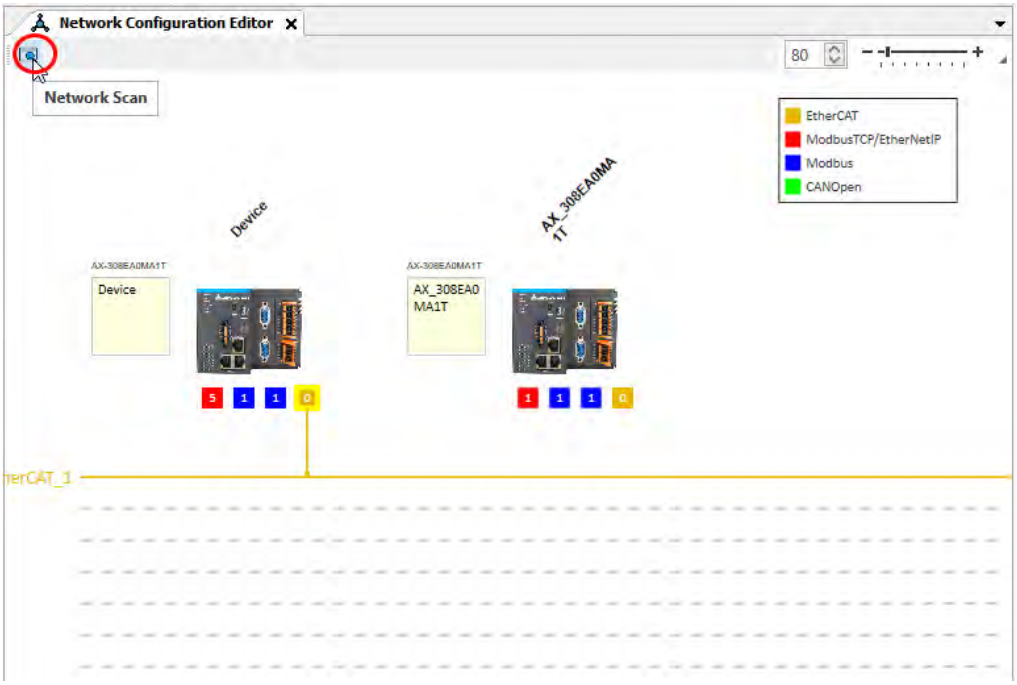
z 5 <¼ s

' -Í Ž Devices 7øB•Nº7k •#<!âh`FÕ#ôI× •o 7î#<!â#Úe •_ð2Ð åAdd Device æÛ_ð2Ð; 5—(… 2X¬OU#Z #Ö Û

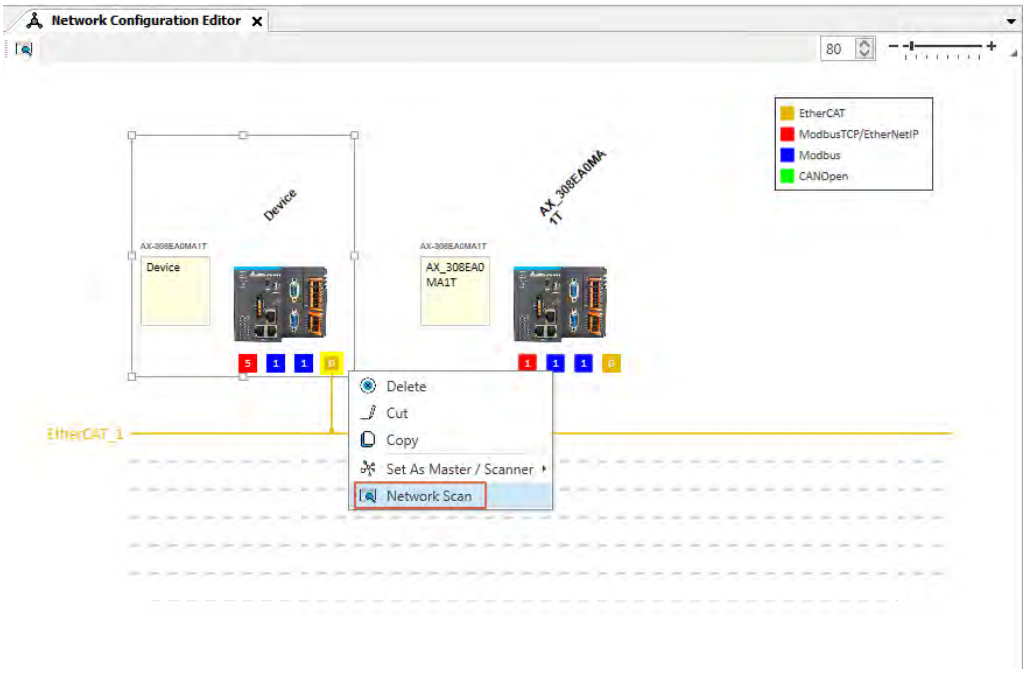


z 5 <¼ ð

#<!â&å7î-Ì!^7öFk &å7î1ý6 #<!â3Ž" &O •#<!âo 7î#Úe •_ð#½å Network Scan æ#ÖQÑ"•2R3¶" -ÙN¶a4 OU 2X¬OU#±O8NÃP;7! Û



6



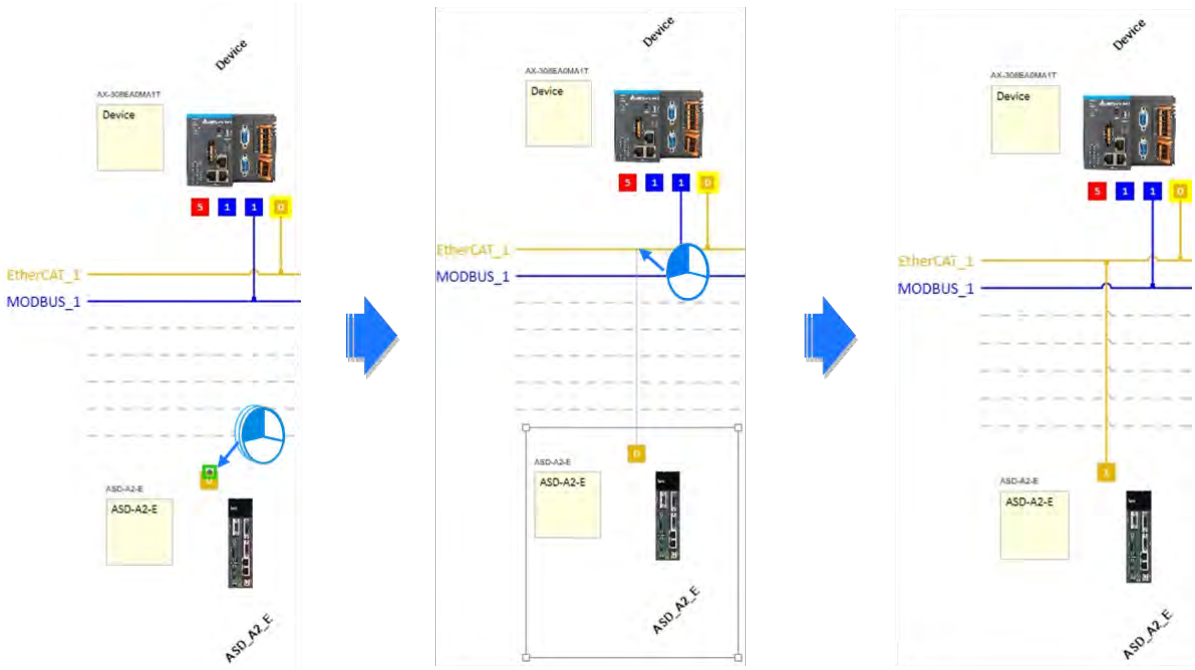
6.1.3.2 c¼2cN Mš

+s1÷Ri@ a4OU 2#õ •3Œ ò7L ¦6 +í2'6ðRi@ „3U r!/FkY«!ù_Å ñ2',EFkO8NÃ Û2'5 2èFkO8NÃ5 .ö-Ù' K 6.1.2 Ri[Û5õ Û

z -¸I‰N MšO 5ø

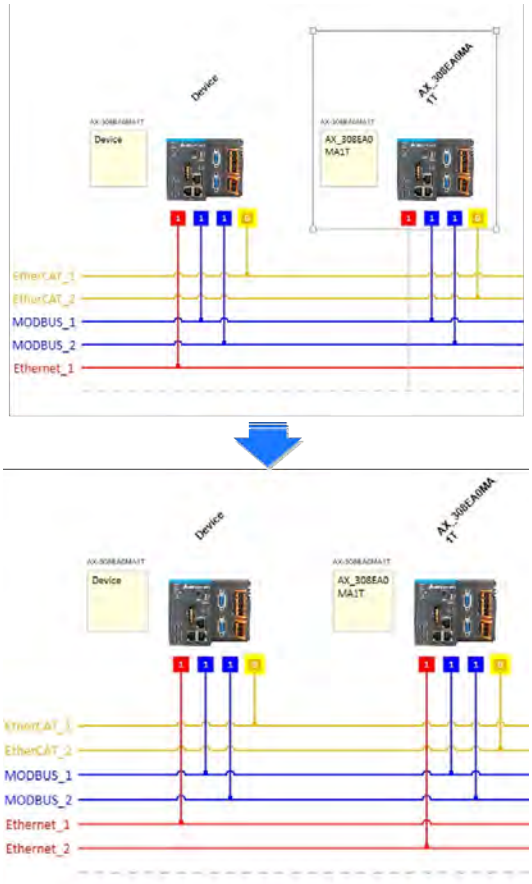
„ 0¬(j ç •

+ío 7î2½6ÚQÚ-Ù.áJ²FkO8NÃ ñ#õ • û[ÌO8NÃFkLb'r õ` [–#Ê çQÛ •" 5%.ço 7î#õ ¦#Ö.áJ²P;7! Û



„ 0¬(j s •

+ío 7î2½6ÚQÚ6ç ò5 FkVA' N¦5%.ç •" 5—(… ç7HFß#óLb'r 2Fß#óO8NÃ.]+í` [–#Ê_Å3Œ ñ •.]' ò5 !t5—(… ç7HVAN¦ Û



6

7

Iê7 Iž ^Ž!f2e ô&¸5êZ|*X Ì3‹

E¬.

7.1 _·"•3Ž" 2î Ë9i_× 7-5
7.1.1 _·"•3Ž" 2î Ë 7-5
7.1.2 _·"•3Ž" 2î Ë.{E Yh@ 7-5
7.1.3 _·"•3Ž" 2î ËFk!íLb 7-5
7.2 _·"•h`FÕ.áJ²=(Iò 7-6
7.2.1 h`FÕ.áJ²=(Iò&å 7-6
7.2.2 h`FÕ.áJ²=(Iò 7-6
7.3 F¸3Ž õ[ê=2 .....7- 13
7.3.1 fE 5 <¼ 7- 13
7.3.2 _[#©5W[¥+•Rê r 7- 13
7.3.3 =2[¼_[_·_S 7- 15
7.4 _·"•3Ž" X¬OU 7- 18
7.4.1 _[[¥+• 7- 18
7.4.2 _[²N´ 7- 18
7.4.2.1 _[#©5W ²N´ 7- 19
7.4.2.2 Iò.v fE _[.....7- 27
7.4.3 #<_[a4OU=(Iò õ[¥+•;Lj‹ 7- 28
7.4.4 _[N«[¥+• 7- 36
7.4.4.1 _[N«#©5W ²N´ 7- 36
7.4.4.2 Iò.v fE _[N« 7- 38
7.4.5 _[N«a4OU=(Iò õ[¥+•;Lj‹ 7- 39
7.5 _·"•_[#¿a¶ 7- 44
7.5.1 #<_[#¿5W 7- 44
7.5.2 _[N«#¿5W 7- 46
7.6 _·"•3Ž" Iò.vNý_x 7- 48
7.6.1 _·"•3Ž" Iò.v 7- 48
7.6.1.1 DIADesigner -AX Ný1÷7•7k õl´Lb 7- 48

7.6.1.2 DIADesigner -AX Fk POU..... 7- 49
7.6.1.3 DIADesigner -AX 5—(.P.OU..... 7- 49
7.6.1.4 PDO 6 +ë ‹Mapping Œ..... 7- 52
7.6.2 _[B•/è_S3I 7- 52
7.6.2.1 _[B•/è 7- 52
7.6.2.2 _[N«B•/è 7- 54
7.6.3 _·"•3Ž" 2î ËFk2NX3$sB•/è 7- 55
7.6.3.1 2NX32î ËFk'á7 Y«" 7- 55
7.6.3.2 _z!L/ _z!á.üQ 5Ý.v&å..... 7- 57
7.6.3.3 #< ç_·"•2î Ëa´(ô2NX3 2X3 ! 7- 58
7.6.3.4) _·"•2î Ë#ó5Ý$ "• 7- 58
7.6.3.5 _·"•2î Ë#ó5Ý2NX3 2X3 ! 7- 59
7.6.4 4OU..... 7- 64
7.6.4.1 4OUFkI´Lb..... 7- 64
7.6.5 !ß_UXO$s!ß_U7•7k..... 7- 64
7.6.5.1 E +7!ß_U7•7k..... 7- 64
7.6.5.2 E +7!ß_U.áJ² 7- 65
7.7 _·"•3Ž" "†Pä 7- 69
7.7.1 LâNÆ7•7k..... 7- 69
7.7.2 #<_[3Ž" 7- 69
7.7.2.1 $O7 #ó;L 4OU: .ö ‹Cyclic Synchronous Position Mode Œ..... 7- 69
7.7.2.2 4OUY«!ù: .ö ‹Profile Position Mode Œ..... 7- 70
7.7.2.3 +• 4 ..... 7- 70
7.7.2.4 C;I5 .ö 7- 71
7.7.2.5 E +7of_U ‹MC_GearIn Œ..... 7- 74
7.7 .2.6 4OU2î+•E +7of_U ‹MC_GearInPos Œ..... 7- 76
7.7.2.7 E +7!ß_U ‹MC_CamIn Œ 7- 77
7.7.3 ` .•3Ž" 7- 86
7.7.3.1 CSP : .ö 7- 86
7.7.3.2 CSV : .ö 7- 87
7.7.3.3 ` .•Y«!ù: .ö ‹Profile Velocity Mode Œ..... 7- 87
7.7.4 2TGÐ3Ž"..... 7- 88
7.7.5 #<_[3Ž" Fk. E "†Pä 7- 89

7.7.5.1 4OU$d Ë....7- 89
7.7.5.2 ` .•$d Ë 7- 90
7.7.5.3 "‡` .• õ!¶` .•$d Ë 7- 91
7.7.5.4 "‡` .•Fk#¿"ýCn ‹]ª.• Œ$d Ë 7- 92
7.7.5.5 _[5 #ø 7- 93
7.7.6 _[N«3Ž" 7- 95
7.7.6.1 _[N«FÛN¦3¹XL....7- 95
7.7.6.2 _[N«W¡5²3¹XL....7- 96
7.7.6.3 _[N«$d Ë C;I 7- 97
7.7.7 7 :j¿` IO 7- 98
7.7.7.1 I/O "†Päa4OU....7- 98
7.7.7.2 DIO "†Pä[¥+• 7- 99
7.7.7.3 SSI NýGè&O"†Pä[¥+•....7- 102
7.7.7.4 Pulse Enc Rder "†Pä[¥+• 7-1 08
7.7 .7.5 Capture/Compare "†Pä[¥+• 7- 116
7.7.7.6 Pulse Output "†Pä[¥+• 7- 121
7.7.7.7 j¿` IO e [ÖHU[‹ 7- 126
7.7.8 !]+j"†Pä 7- 127
7.7.8.1 6Û5 C—' 4OU....7- 127
7.7.8.2 _V Ý7hf7 ....7- 128
7.7.8.3 _äfv[Ö-Õ[¥+• 7- 128
7.7.8.4 3!7-@ "†Pä....7- 129
7.7.8.5 3<30 4OU....7- 130
7.8 Rê rlò.v 7- 131
7.8.1 [¥(î7•7k 7- 131
7.8.1.1 fE [¥(î 7- 131
7.8.1.2 [¥+• 7- 131
7.8.2 'á7 h`FÕRê r 7- 132
7.8.2.1 !6ôLâNÆServo On 7- 133
7.8.2.2 #<_[e [Öa´OU õF¸3Ž....7- 134
7.8.2.3 F¸3Ž2î Ëe [Ö 7- 137
7.8.2.4 #<_[4´ CJ²#Z C;I 7- 139
7.8.2.5 #†@ &Å/9....7- 141

7.8.2.6 NÄ+à #+• 4.....7- 144
7.8.2.7 !ß_U"• C !î3I!ß_UXO 7- 145
7.8.2.8 !ß_U"• C 2NX3 "_[FkFß 4XL f 7- 154
7.8.2.9 Iâ"•3Ž" _®Iò #¿6Û/:"4 4OU 7- 161
7.8.2.10 " µ_[of_U%U#ï_®Iò 2NX3 4Iâ_ä"‡ 7- 166

7.1 ^Ž!f2e ô1Å ¢8@^®

7.1.1 ^Ž!f2e ô1Å ¢

7 Ri ²N´ m_·"•3Ž" Iò.vFk!*M •"ì2ÓX¬OU •K #Þ#±_·"•3Ž" 2î Ë Û

_·"•3Ž" 2î ËX'+• 0 !"†Pä'> ‹FB Œ •.]' Iò.v X'E u2NX3) I´_·"•3Ž" FÕFk Û7 22!s2' ²N´Fk å MC æ _·"•3Ž" 2î Ë#Z6 'á u PLCopen*Fk_·"•3Ž" "†Pä'>FkY«Rê2'.ç#¸ Û

7 Ri3· , PLCopen"†Pä'>$s#×_¥QÑ+• 0"†Pä'>_À I´_·"•3Ž" 2î ËFk9i_× Û PLCopen+• 0 mIò.v$s"†Pä'> Fk3Œ#Ê •µOó+…C—IEC61131-32'+• 0Fk7î!-"ý_·"•3Ž" NýIòC–(j Û fE 'á uPLCopenFk2î Ë4 a4#×_¥+• 0 Fk2î Ë •#Öf4 5'à["$s2g7 5 2èK01÷7 Û

' fE _·"•3Ž" 2î Ë 2"4 •[ÞHU Ä0•!,!í mYÊX¬OU •K #Þ$s2î ËFk"†Pä Û#Ö Ì#©OêAXn _·"•"†Pä'>22!sf+ /< • Ì/Ò` 7Ì[É_·"•3Ž" 2î Ë!þXO$sFß!Ze [Ö ÊGè Û

*;¦ • PLCopen6 ç&äf,7î!-"ýN«N® •!]3•"• ÌIEC61131-3 !'áH'Fk-Ì 3Ž" 7î!- •.]' PLC NýIò X'.f<Âa®

E Û!Z u PLCopenFk6Û) È0V •[Þ7ÌFò+•5 O8JÀ http • //www.plcopen.org/ Û

7.1.2 ^Ž!f2e ô1Å ¢-RCæX??w

;K;œT$[Û5õ_·"•2î Ë.{E 5ÝFka´Yh4´ CY«8#$sf7" •#ë2î ËFk[ÍN- È0V ' K 7.6.3Ri_·"•3Ž" 2î Ë[Û5õ Û

z ^Ž!f2e ô1Å ¢3í1¿EBMÔHÉZ«X¾

DIADesigner-AX5 2èFk2'6ðNýIò[ÔYç7L.áJ² ÚNý_x1ý6 NÛ2‹Iò.v Û5 2èFkNý_x[ÔYç"ì$ 8–/I&å ‹LD Œ Ú ha.v"†Pä&å ‹SFC Œ Ú_ÅNÔ"†Pä&åC‹FC Œ Ì#±Nº7k"ý[ÔYç ‹ ST Œ Ú"†Pä'>&å ‹FBD Œ Û

!Z uNýIò[ÔYçFk[ÍN- È0V •[Þ#©OêDIADesigner-AX^- ´1 J Û

7.1.3 ^Ž!f2e ô1Å ¢EB ÄK9

; K ; œ T $ [Û 5 õ _ · " • 2 î Ë ! í L b • F ß + à . { F k _ · " • 2 î Ë ! í 'SM#3Ö_Basic Ú DL_MotionControl Ú DL_MotionControlLight!ä.ö.z7Ì2e •[ÍN-!l+ #Ö#©Oê AXK¹ Õ^Ž!f2e ô1Å ¢1 J ²

K9 é	&I-Í	!]O»NbM,	Z²4Ì
#<_[_·"•3Ž" 2î Ë	_·"•3Ž" 'r	+• 43Ž"	“MC_”áu PLCopenFk_·"•3Ž" 2î Ë “DMC_” •#×_¥QÑ+• 0_·"•3Ž" 2î Ë “SMC_” • _·"•2î Ë “MC_XXX_DML” •#×_¥QÑ+• 0_·"•3Ž" 2î Ë • fE u+• 4_[
		` .•3Ž"	
		",GÐ3Ž"	
		#ó;L3Ž"	
	K^Cí'r	K^Cí"†Pä	
) _[_·"•3Ž" 2î Ë	_·"•3Ž" 'r	_[N«_·"•	) _[_·"•
	K^Cí'r	) _[K^Cí"†Pä	) _[[¥+• ÚF¸3Ž Úa´OU

7.2 ^Ž!fg7E¬-¸l‰;ÿHÉ

7.2.1 g7E¬-¸l‰;ÿHÉ%¼

h`FÕ.áJ²=(Iò&å •5[ _·"•h`FÕ.áJ²#±_[a4OU Û

7.2.2 g7E¬-¸l‰;ÿHÉ

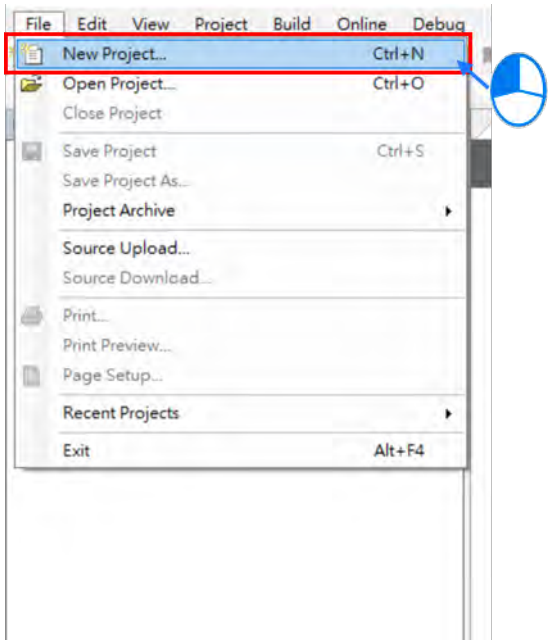
z .áJ²_·"•h`FÕ=(Iò ²N´

„ ' 83gI/Ò3^5 .ö(ë •#³!â DIADesigner-AX ICON .ç$ _V Ý Û

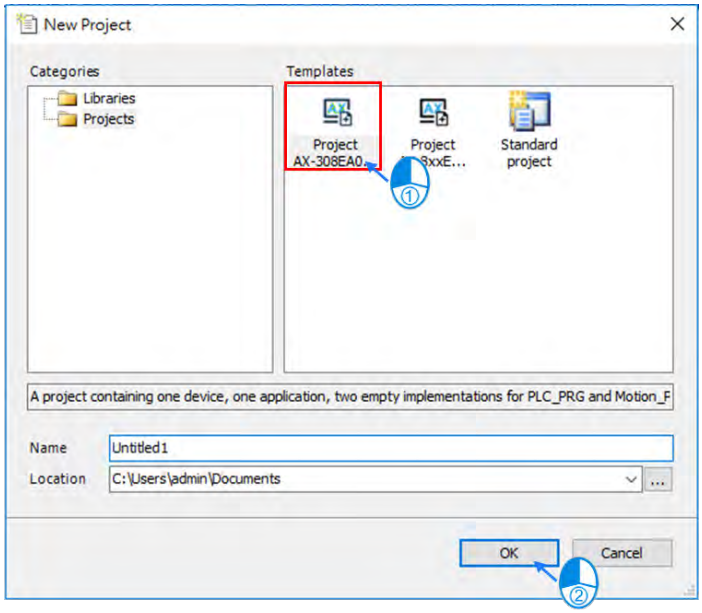
7

„ #<!â File

„ _ð2ÐNew Project



„ 3ŒG" New Project J~#Ê „.v_z!LåNameæ#å Location æ]_ð2Ð; .áJ²h`FÕ7!l´ ¦K=(Iò Ì AX-308E 7!l´ C[Û5õ •&Ç;K[Þ_ð2Ð å Project AX-308EA0MA1Tæ

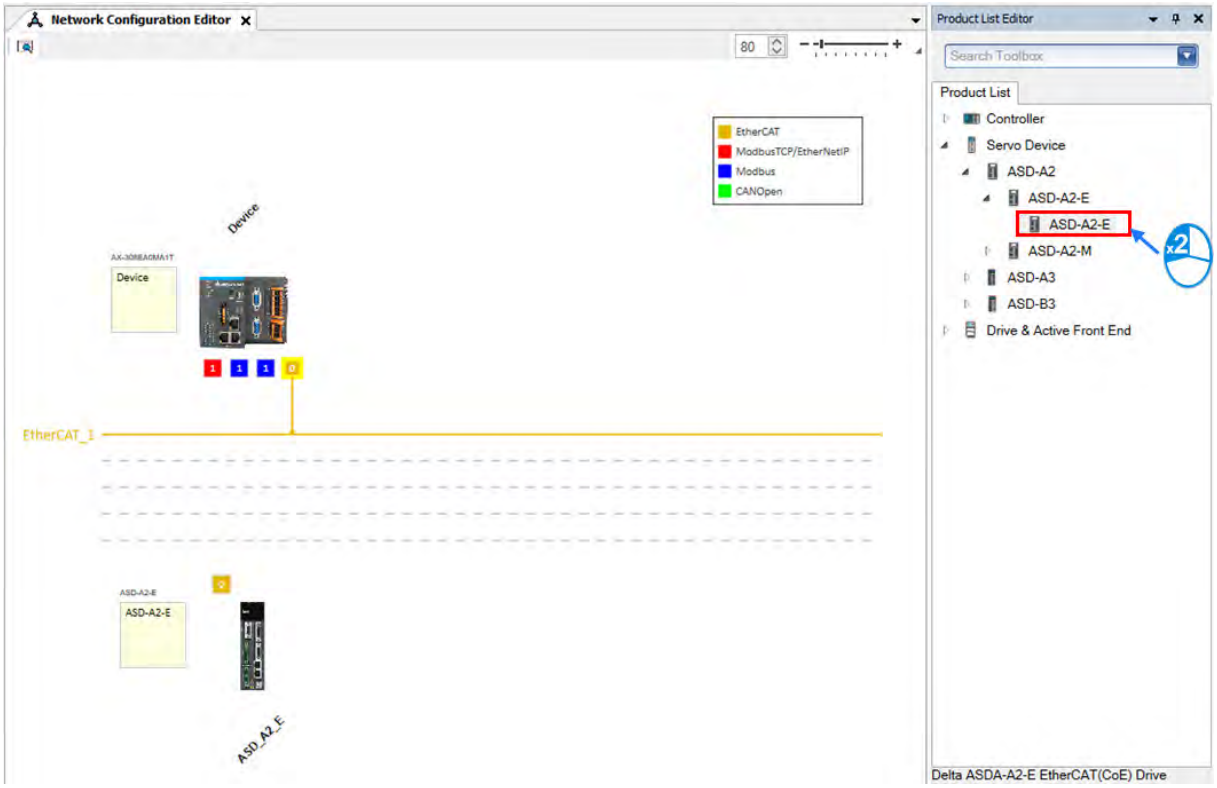


„ o 7î-Íe #³!â å Network Configuration æ_ÂX3EtherCAT O8NÃa4OU

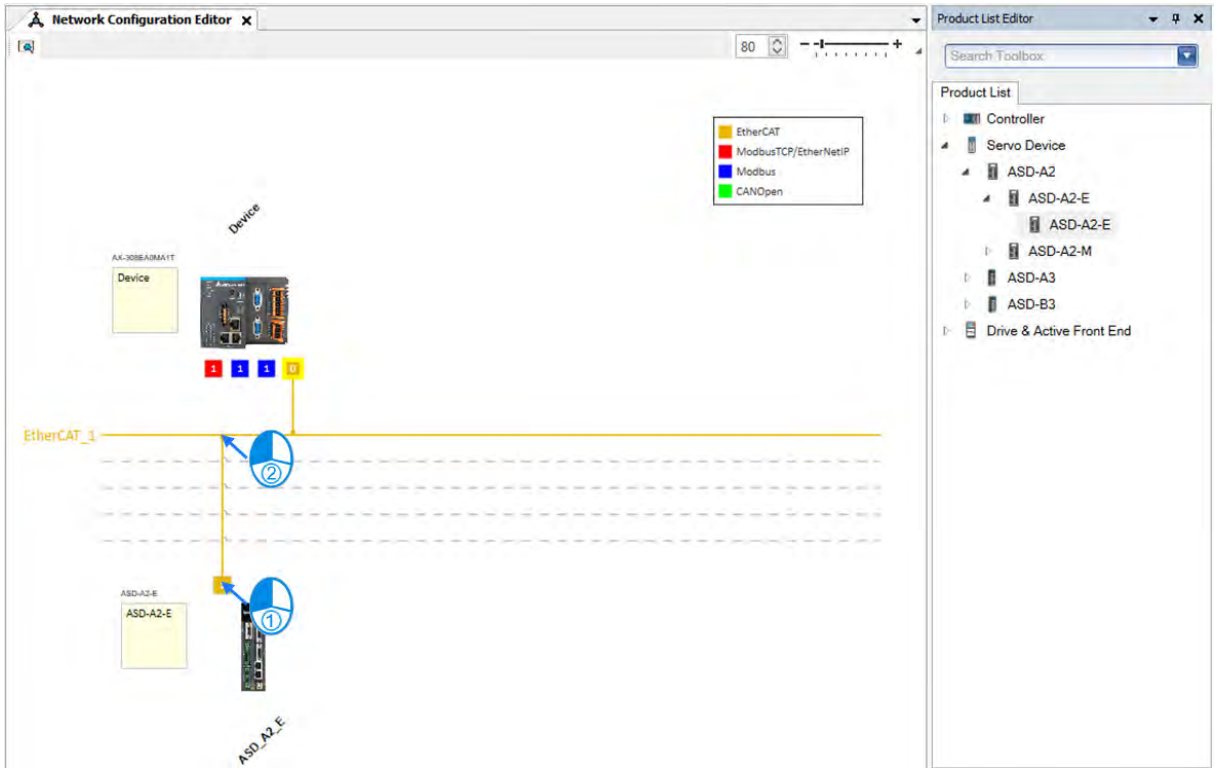
„ o 7î-Íe #³!â#õ !áC— åNetwork Configuration Editor æ• µJÀX¬OU#ÖE #Ú ŽFåroduct List Editor æ+â2e .]5—(… Û

7

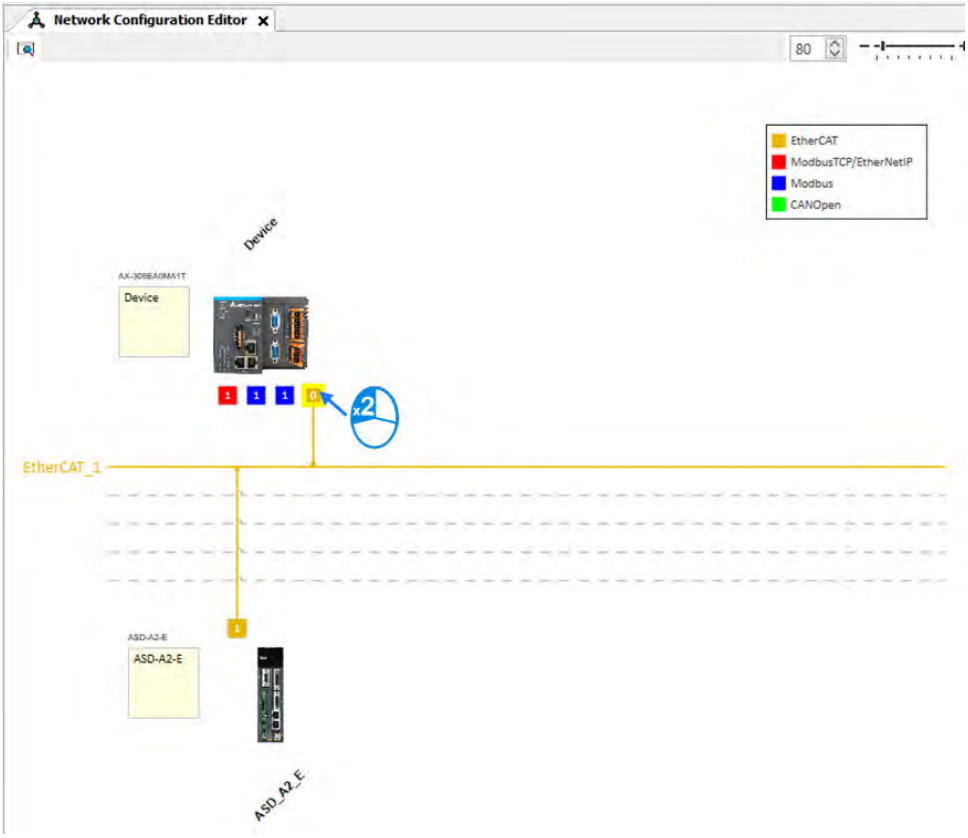
„ [Þ_ð2Ð åServo Device æ Æ åASD-A2 æ Æ å ASD-A2-E æ•o 7î-Íe #³!â#õ QÑ"•5—(…QÚ åNetwork Configuration Editor æ Û



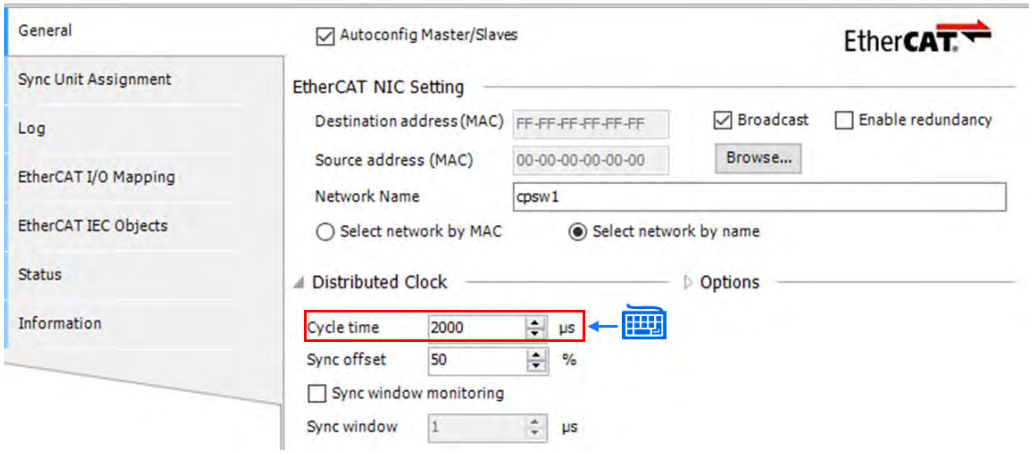
„ [Þ#<!â µJÀ ñgIn«RY5 8- •.]2½2äQÚ EtherCAT "N¦ ñ+s1÷ "JÀ õ µJÀP;7!a4OU Û



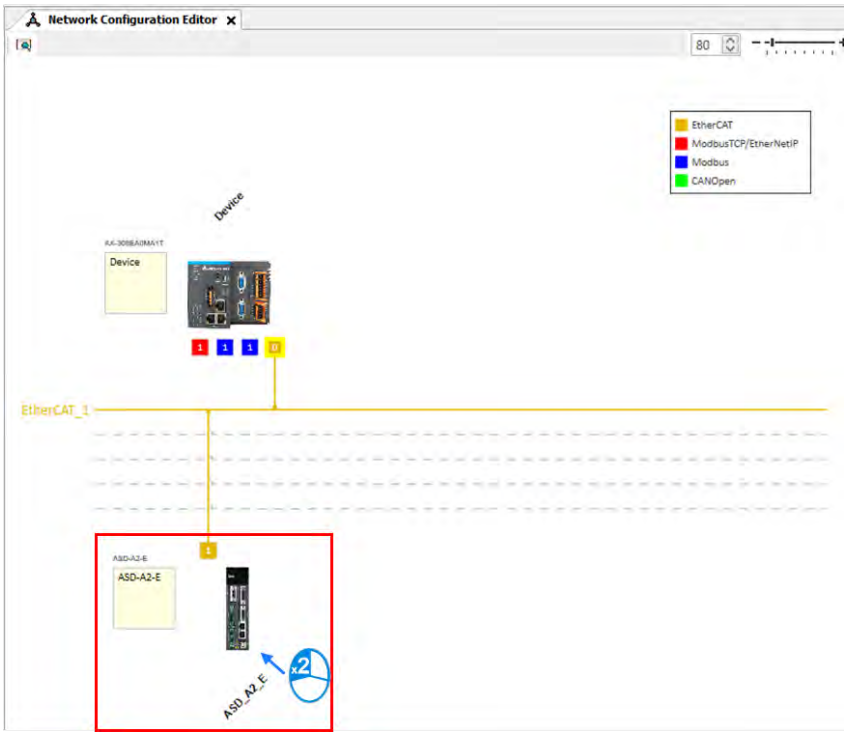
„ o 7î-íe #³!â "JÀn«RY+ö5 8-_ÂX3 EtherCAT "JÀ#©5W[¥+• Û



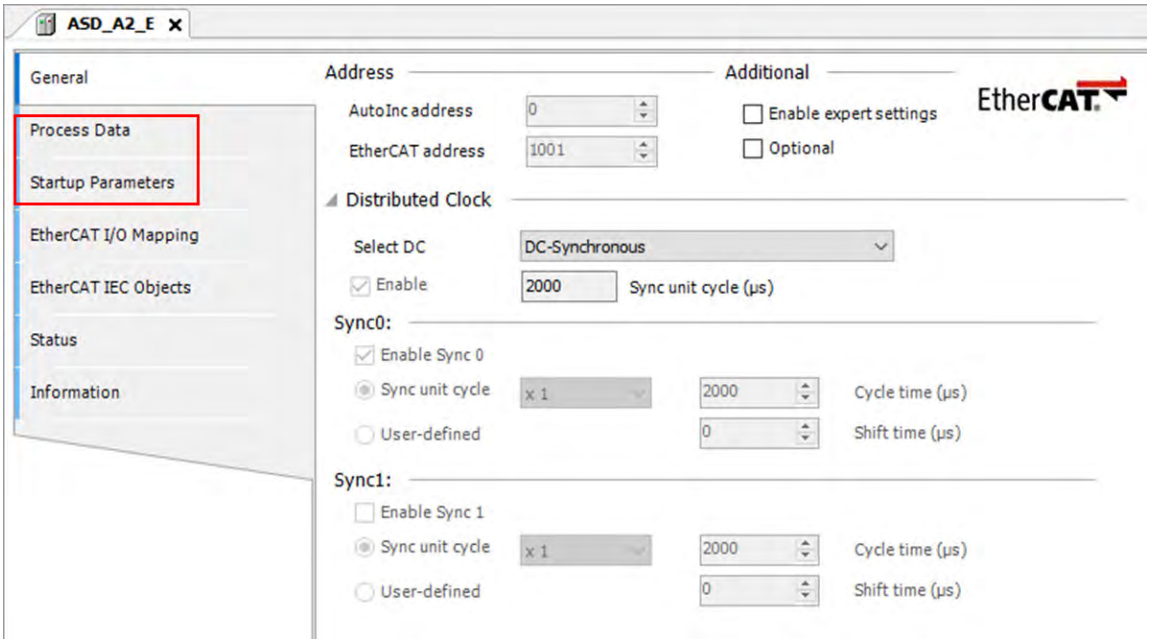
„ "JÀ[¥+• •#Ö[¥+• EtherCAT #ó;L5ÝeÛ Û



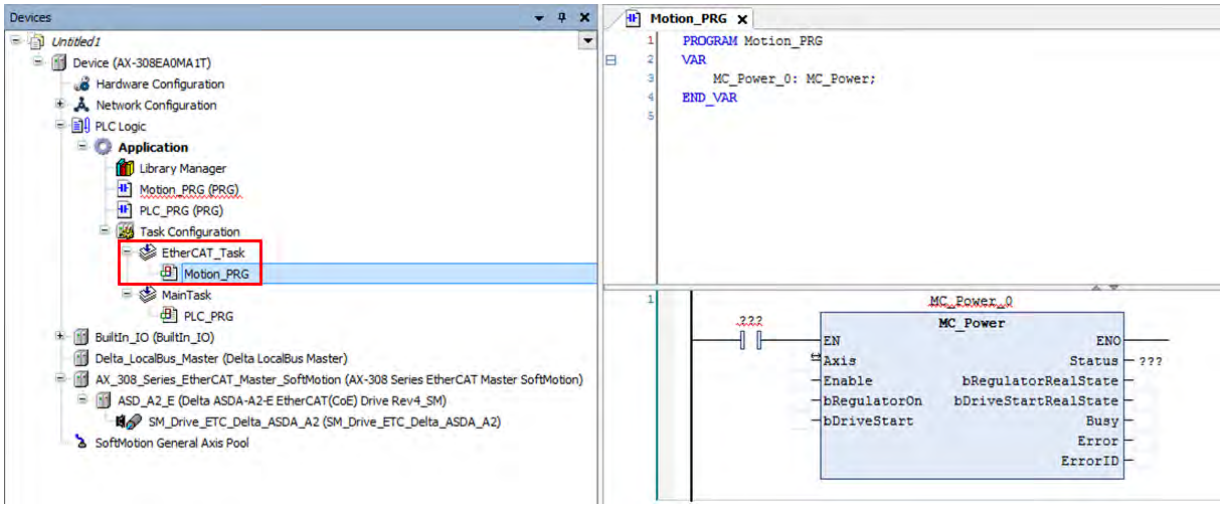
„ [Þ' µJÀX¬OU ñ2NX3o 7î-Íe #³!â_Â µJÀ EtherCAT [¥+•



„ #³!â#õ / !á µJÀFß!Z[¥+•h\gI •)iJÀ#Þ[¥OU ÚåProcess Data æ[¥+• õ åStartup Parameters æ[¥+•K0… Û



„ 2#õ#Ö Ì.ç)²_ÂX3Iò.vNý!€ Ûfç<Ï0öö •6ð!Z u_·"•2î Ë`Ï!í[Þ' åEtherCAT_Task æ.| ò 2 POU fE _·"•"†Pä'>Ný!€Iò.v •`f!4_·"•"†Pä'>5Ç<¼;J. _·X3 Û



7.3 E•2e ÌZÁ<

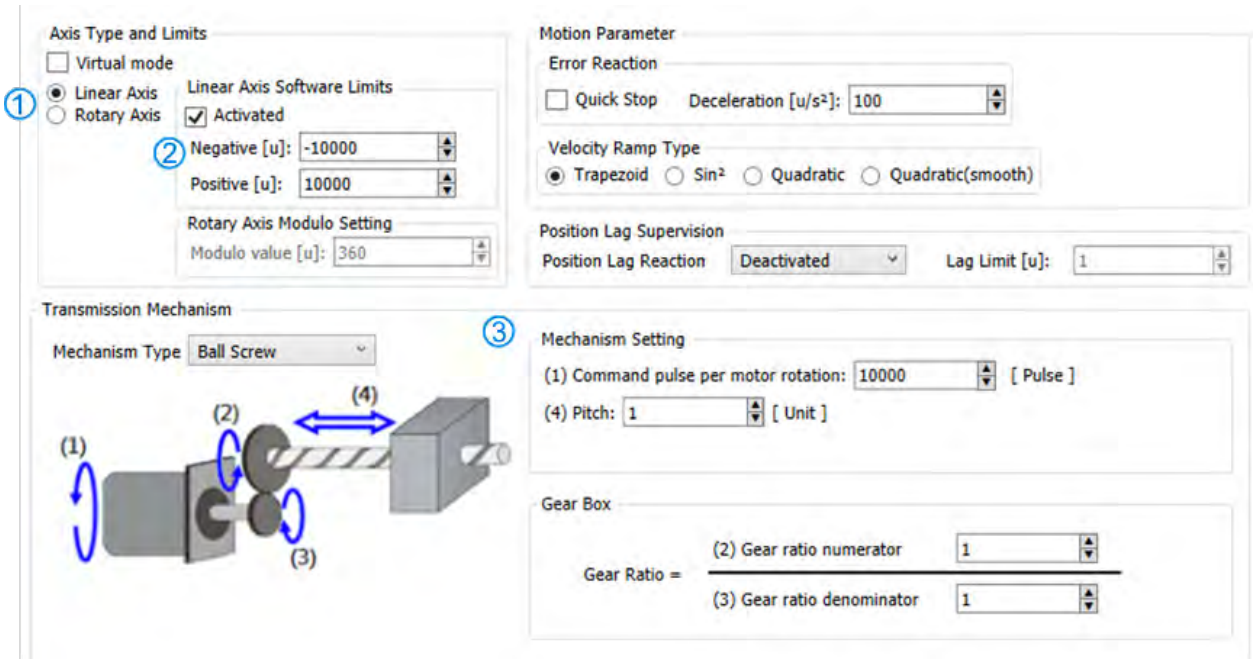
7.3.1 =Cæ4w;“

.áJ²F¸3Ž[ê=25 <¼;Lj‹)i ò •

7.3.2 ^2"€4.Z|*XQÁ I

fE _V Ý=2[¼5Ýfç!/[¥+•_[#©5W •[¥+•5 <¼)i ò •

z _[[¥+•E"gl



z #©5W[¥+•

#©5W#ôI×	[¥+•
_[I´Lb c	FÛN¦_[
5²_S ç&ïPð!™5W₡	10,000
5²_S ç&ïlâ"•]ÄI¢ e	1*1
E +7of_U_!í;´	128*2
E +7of_U_!í+7	1*2
_V Ý;J7hf7 d	10,000
_V Ý#´7hf7 d	-10,000

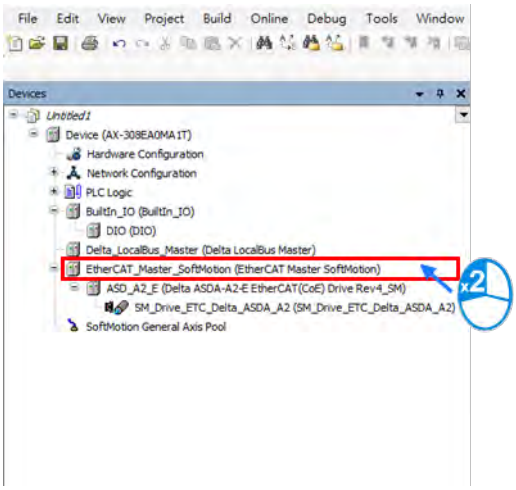
<Ï •

*1 #< 4 ! 1mm •fçlâ"• 1um "†Pä'>fç_z!L 0.001 Û

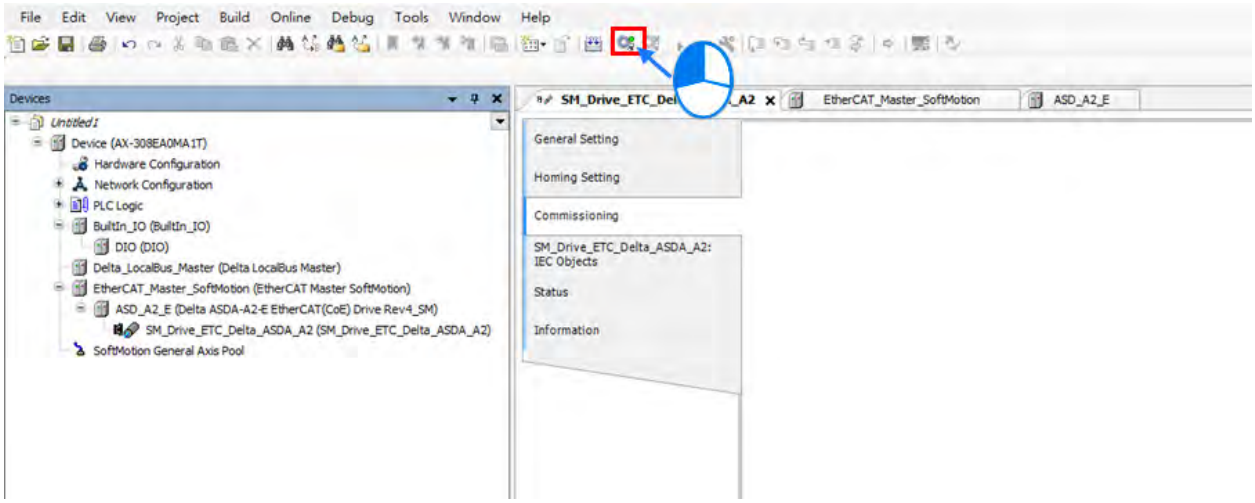
*2 ;K[¥+•hb[¥+• !6ôJÖFk P1-44 õ P1-45 Û

7.3.3 < Z“^2^Ž^*

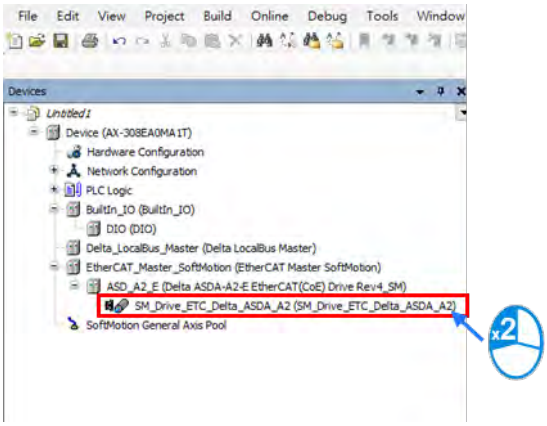
z _ð#½ åEtherCAT_Master_SoftMotion æ#õ#³!â-Íe



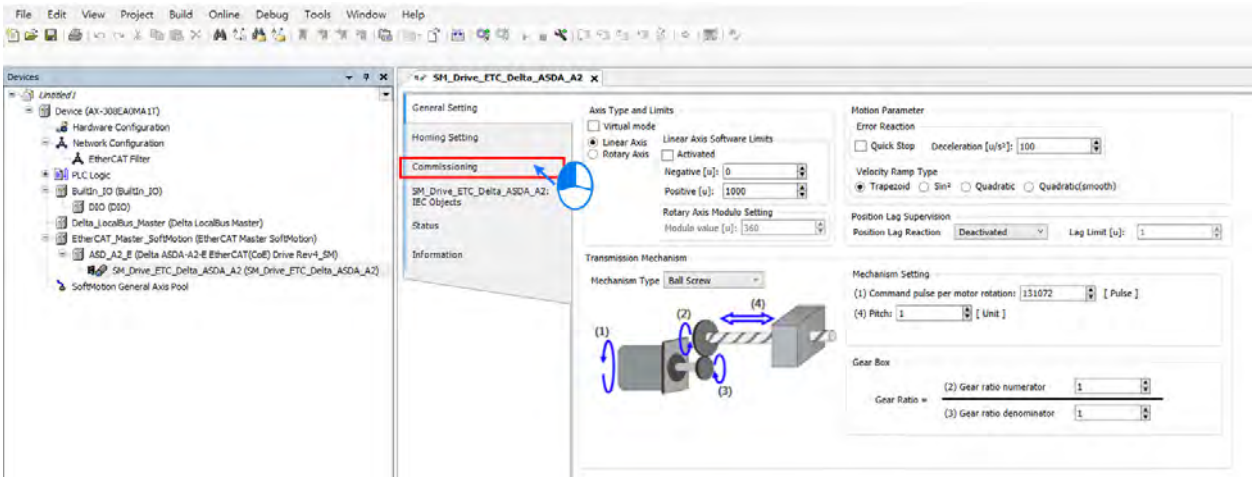
z _ð#½ åOnline Config Modeæ#õ#<!â-Íe



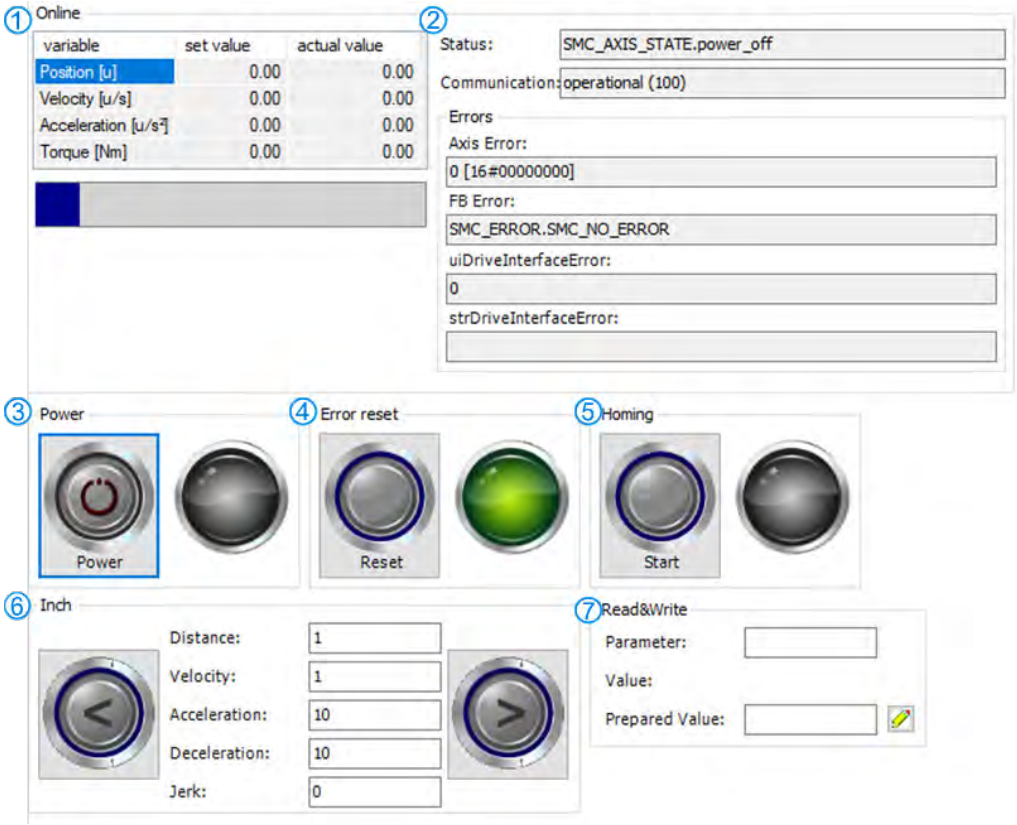
z /:_Â!L' N¦[ê=2#õ •_ð#½ å SM_Drive_ETC_Delta_ASDA_A2 æ#õ#³!â-Íe Û



z _Â!L_[#©5WE"gI#õ •#<!åå Commissioning æ!íh\ Û



z do+àF¸3Ž[ê=2E"gI ²N´



„ c _[$d Ë È0V

"ËH®	!]O»
Position[u]	$d Ë 4OU õ+…f, 4OU
Velocity[u/s]	$d Ë` .• õ+…f,` .•
Acceleration[u/s²]	$d Ë"‡` .• õ+…f,"‡` .•

"ËH®	!]O»
Torque[Nm]	$d Ë",GÐ õ+…f,",GÐ

„ d _[` [–B•/è#±_[B•/è

"ËH®	!]O»
Status	_[B•/è
Communication	` [–B•/è

„ e _[$ "• •[¥+•_[$ "•/ !ZeÔ

„ f =ìfKe [Ö •=ìfK !6ô_[e [Ö È0V

„ g &Å#†@ •[¥+•_[&Å#†@

„ h _[#ò"•

"ËH®	!]O»
Distance	Iâ"•]ÄI¢
Velocity	Iâ"•` .•
Acceleration	"‡` .•
Deceleration	!¶` .•
Jerk	"‡` .•Fk#¿"ýCn ‹]ª.• Œ

„ i [â!€_[#©5W •[¥+• õ[â#½ ñ3Ž_[#©5W •)ifç[â#½1ý Õ5 !6ô_[+à\H+>!_ ‹Object Dictionary Œfç Ì ò!þ _z!L

- Ì[â#½#±!€!L !6ô+à\H+>!_Fk 0x6098 ;K#©5W

1 = !&á+•Gè

6098 = ![â!€Fk#©5W

00 = !;K#©5WFksub

1. +í 0x1609800 _S ! 10 _Â 4 ! 23,107,584
2. Ì 23,107,584 _S ! -23,107,584
3. !t+í- 23,107,584 _z!LQÚParameter , #Ö[â#½ !6ôFk#©5W0x6098

7.4 ^Ž!f2e ôWƒN,

7.4.1 ^2Z|*X

·"•3Ž" X¬OU "YhE u[¥OU[#©5W Û') 5WFk.{E •0•#Ö Ì' DIADesigner-AX_V Ý!I[¥+•_[#©5W • DIADesigner-AX_V Ý+à uE 2 7L[Û6 5 ¦FkNý_xC–(j ‧ DIADesigner -AXNý_xC–(j •_·"•3Ž" Fk_[#©5W[¥OU X'+• 01÷!] ú,E5W3UNº7k •' !]Nº7k ò6 E) Fß!Z#©5Wf-#ï' ç]^ Û

7.4.2 ^2 ‰M‹

' _·"•3Ž" LâNÆ •+í_·"•3Ž" Fk+à\HI× !_[Û_[$ 6ð+…f, !6ôjX"•&O ÚNýGè&O$sVA2Æ !6ôjX"•&O Û òXO !þ!áFÕ"42'6ð_[Lb'r •

Lb"	"†Pä
+• 4_[*1	` _® EtherCAT ` [–2NX3'á7 +• 43Ž")iNÄ+à+â" ÚFß+à+• 4… K0"†Pä Û
` .•_[*1	` _® EtherCAT ` [–2NX3` .•3Ž" õ",GÐ3Ž" ‹;K: .ö ! CIA 402 Velocity Mode Œ Û
#ó;L_[*2	` _® EtherCAT ` [–2NX3 !6ô3Ž" •fK'á7 +• 43Ž" (ý •_¿"ì$ #ó;L_·"•)iE +7!ß _U…K0"†Pä Û
!6ô_[	` _® EtherCAT ` [–_ÂX3+… : !6ô3Ž"
Pð!™'r !6ô_[	` _®Pð!™5 .ö_ÂX3+… : !6ô3Ž"
VA2Æ_[	5Ç_Å3Œ+… : !6ô • ¬' Iò.v X' fE •#Ö2NX3_·"•3Ž" $d Ë Û
NýGè&O_[	fE +… :NýGè&O ‹SSINýGè&O Ú(…a¶'rNýGè&O Œ C ! Ž#Þw
VA2ÆNýGè&O_[	5Ç_Å3ŒNýGè&O • ¬' Iò.v X' fE Û

<Ï 1 •

„ +• 4_[õ` .•_[fç4 a4 DL_MotionControlLight !ä.ö.z Û

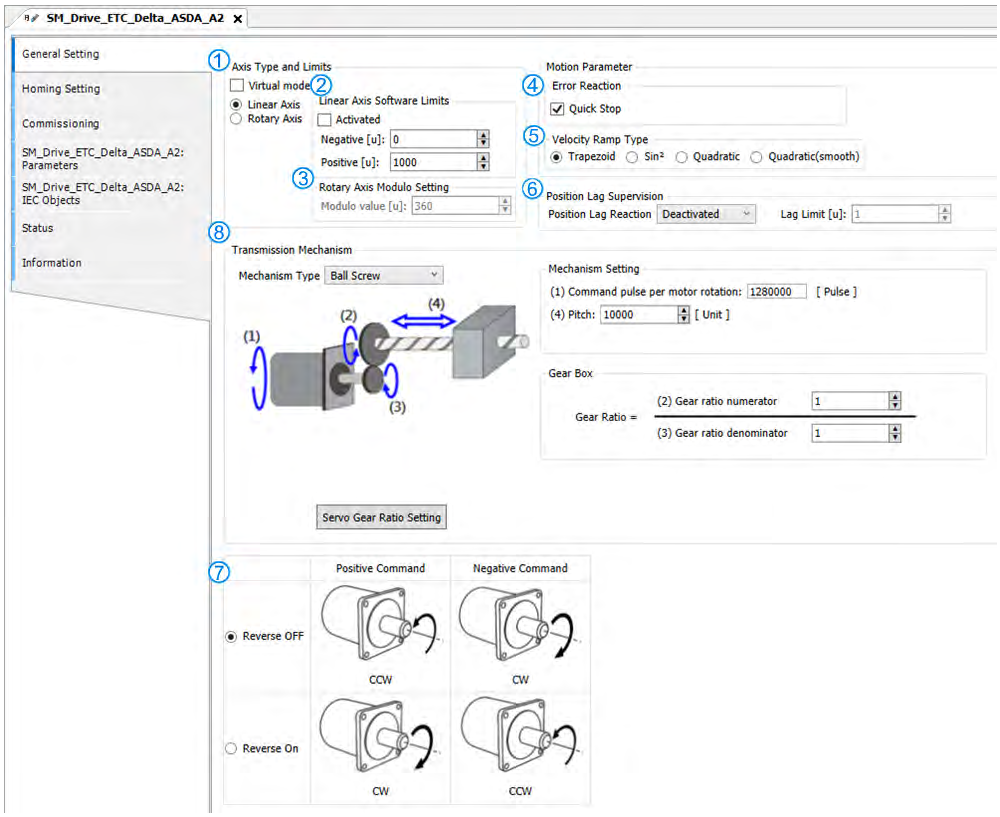
„ /: AX-364EL fE EtherCAT _[5W ¶l_® 64 _[û Soft Motion B/7 ' V4.7.0.0 Ì ò ‧fç Õ5 Library FkIODrvEtherCat ÆETC_Parameter FkMAX_MAILBOX_CHANNELS õ MAX_SDO_Channels #© 5W •5 ! 128 Û

<Ï 2 •#ó;L_[fç4 a4 DL_MotionControl ÚSM3_Basic !ä.ö.z Û

7.4.2.1 ^2"€4. ‰M‹

/:.áJ² !6ô_[#õ •[Ì_[ŽE +à.{Fk_[#©5W • òXO!þ!á!]Fß+à[Û5õ •

z #ó;L_[



„ c Axis Type and Limits

"ËH®	!]O»
Virtual	$ "•VA_[
Linear Axis 'Rotary Axis	[¥+•FÛN¦_[1ý5²_S_[

„ d Linear Axis Software Limits

"ËH®	!]O»
Activated	$ "•_V Ý7hf7 ‹ ¬5 2èFÛN¦_[Œ
Negative[u]	#´_S_V Ý7hf7
Positive[u]	;J_S_V Ý7hf7

„ e Rotary Axis Modulo Setting

"ËH®	!]O»
Modulo Value[u]	[¥+• ç&ïRê&Û ‹ ¬5 2è5²_S_[Œ

„ f Error Reaction

"ËH®	!]O»
Quick Stop	_[M 0 C;I
Deceleration[u/s²]	_[!¶` C;I ‹7 $ "• Quick Stop 246ð5/ Œ

„ g Velocity Ramp Type

"ËH®	!]O»
Trapezoid/Sin²/Quadratic/ Quadratic ‹Smooth Œ	[¥+•_[_·"•6ÙN¦

„ h Position Lag Supervision

"ËH®	!]O»
Positon Lag Reaction	[¥+•>‰ 4#õ_[FkX3 !
Lag Limit [u]	[¥+•>‰ 45W #

„ i Positive ’ Negative Command

"ËH®	!]O»
Reverse OFF ’ON	[¥+•;J#´#ø$d Ë

7

„ j Transmission Mechanism

‹ Servo Gear Ratio Setting

"ËH®	!]O»
Unit Numerator	!6ô!í+7
Unit Denominator	!6ô!í;´

do+à ô#ó7•7k Ì ò!þ ²N´ •

‹ Ball Screw

"ËH®	!]O»
(1) Command Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
(4) Pitch	W¡7-eÛ]Ä
(2) Gear ratio numerator	E +7of_U;»!í+7
(3) Gear ratio denominator	E +7of_U;»!í;´

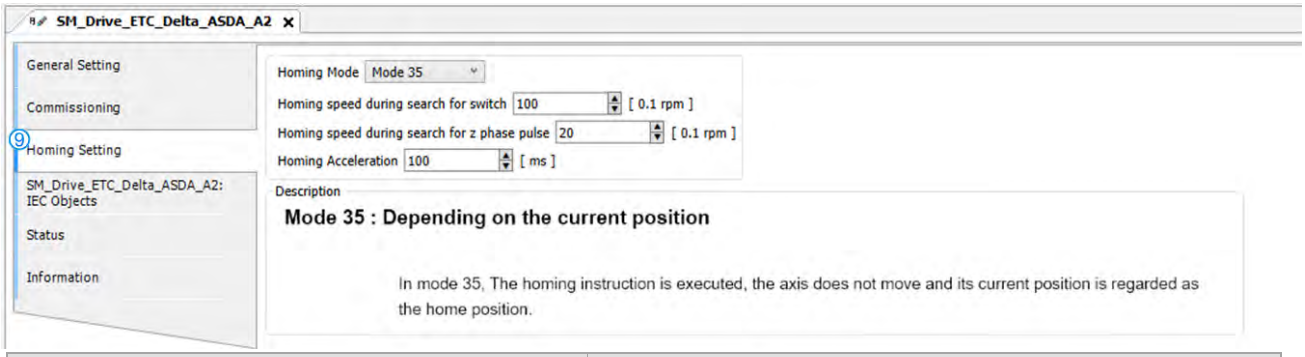
‹ Round Table

"ËH®	!]O»
(1) Command Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
(4) Movement distance per motor rotation	E 7!;¶_SFkIâ"•]ÄI¢
(2) Gear ratio numerator	E +7of_U;»!í+7
(3) Gear ratio denominator	E +7of_U;»!í;´

‹ Belt Pully

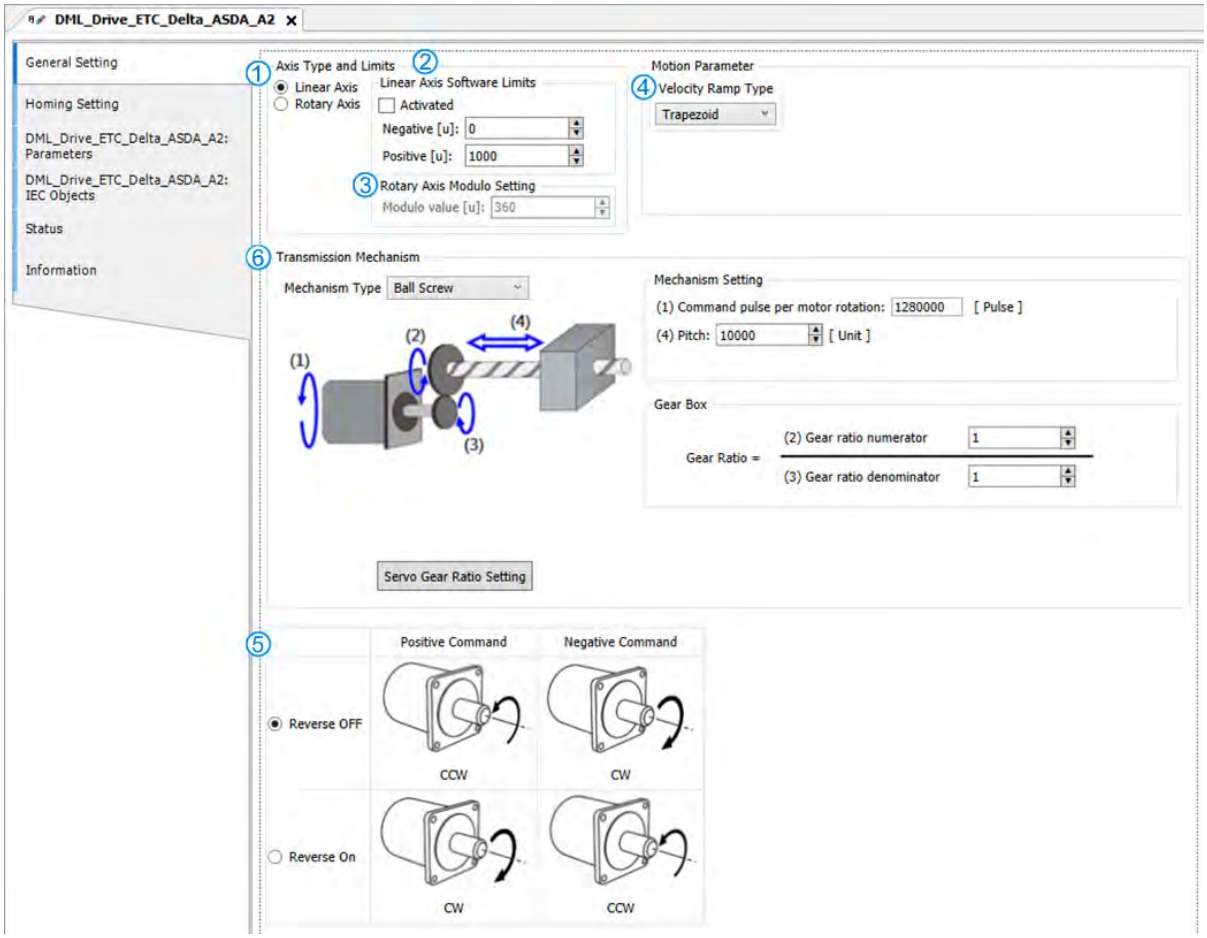
"ËH®	!]O»
(1) Command Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
(4) Diameter ‹Movement distance motor rotation •Diameter *n Œ	FÛ/k ‹E 7!;¶_SIâ"•]ÄI¢ •FÛ/k*n Œ
(2) Gear ratio numerator	E +7of_U;»!í+7
(3) Gear ratio denominator	E +7of_U;»!í;´

„ k Homing Setting



"ËH®	!]O»
Homing Mode	[¥+•#†@ : .ö
Homing Speed during search for switch	[¥+•+â#†@ .ç!Z` .•
Homing Speed during search for z phase pulse	[¥+•+â Z Fß` .•
Homing Acceleration	[¥+•#†@ "‡` .•

z +• 4_[



„ cAxis Type and Limits

"ËH®	!]O»
Linear Axis 'Rotary Axis	[¥+•FÛN¦_[1ý5²_S_[

„ dLinear Axis Software Limits

"ËH®	!]O»
Activated	$ "•_V Ý7hf7 ‹ ¬5 2èFÛN¦_[Œ
Negative[u]	#´_S_V Ý7hf7
Positive[u]	;J_S_V Ý7hf7

„ eRotary Axis Modulo Setting

"ËH®	!]O»
Modulo Value[u]	[¥+• ç&ïRê&Û ‹ ¬5 2è5²_S_[Œ

„ f Velocity Ramp Type

"ËH®	!]O»
Trapezoid/Sin²	[¥+•_[_·"•6ÙN¦

„ gPositive ’ Negative Command

"ËH®	!]O»
Reverse OFF ’ON	[¥+•;J#´#ø$d Ë

„ hTransmission Mechanism

‹ Servo Gear Ratio Setting

"ËH®	!]O»
Unit Numerator	!6ô!í+7
Unit Denominator	!6ô!í;´

do+à ô#ó7•7k Ì ò!þ ²N´ •

‹ Ball Screw

7

"ËH®	!]O»
(4) Command Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
(4) Pitch	W¡7-eÛ]Ä
(5) Gear ratio numerator	E +7of_U;»!í+7
(6) Gear ratio denominator	E +7of_U;»!í;´

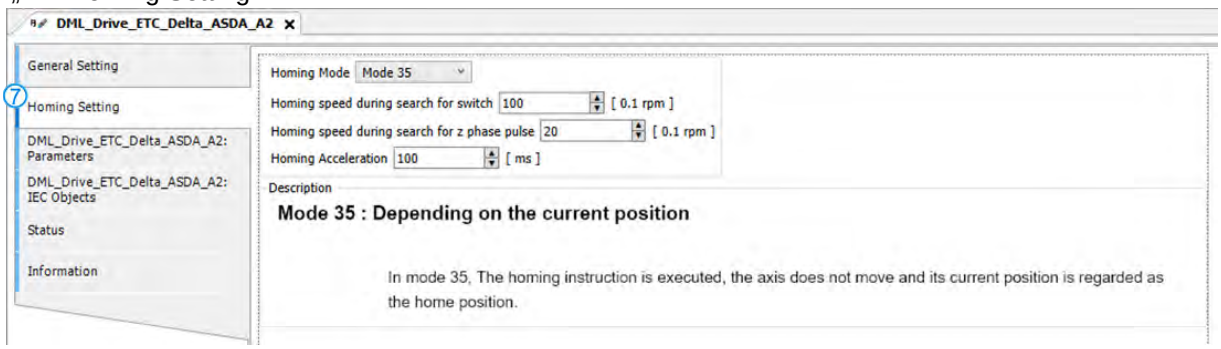
‹ Round Table

"ËH®	!]O»
(4) Command Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
(4) Movement distance per motor rotation	E 7!;¶_SFkIâ"•]ÄI¢
(5) Gear ratio numerator	E +7of_U;»!í+7
(6) Gear ratio denominator	E +7of_U;»!í;´

‹ Belt Pully

"ËH®	!]O»
(4) Command Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
(4) Diameter ‹Movement distance motor rotation •Diameter *n Œ	FÛ/k ‹E 7!;¶_SIâ"•]ÄI¢ •FÛ/k*n Œ
(5) Gear ratio numerator	E +7of_U;»!í+7
(6) Gear ratio denominator	E +7of_U;»!í;´

„ Homing Setting

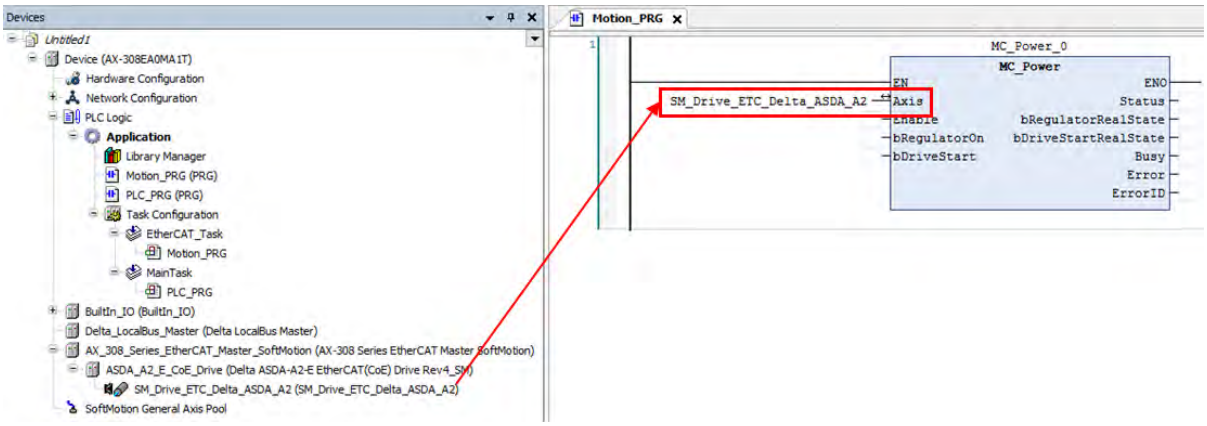


"ËH®	!]O»
Homing Mode	[¥+•#†@ : .ö
Homing Speed during search for switch	[¥+•+â#†@ .ç!Z` .•
Homing Speed during search for z phase pulse	[¥+•+â Z Fß` .•
Homing Acceleration	[¥+•#†@ "‡` .•

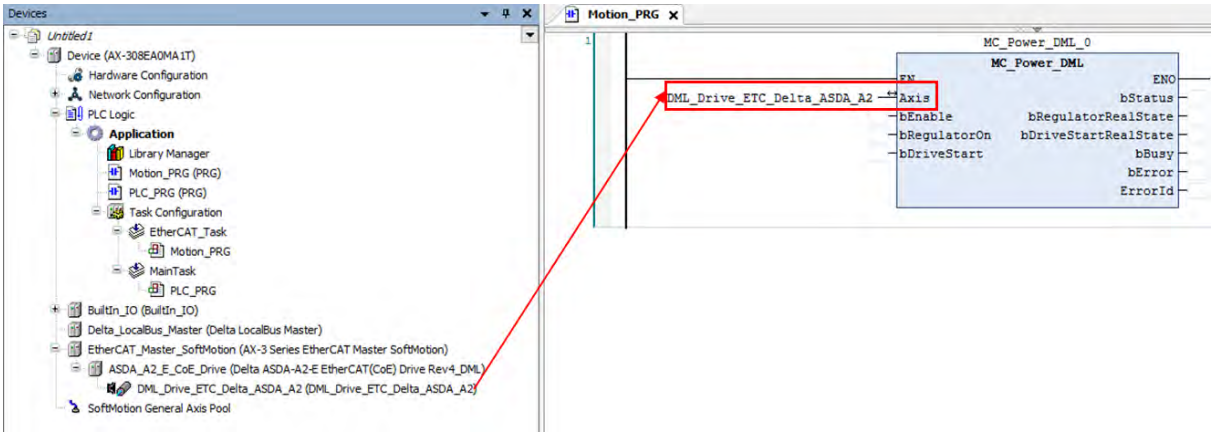
7.4.2.2 HÉ-M ë =Cæ^2

/:h`FÕ 5—(… !6ô_[#õ •LâNÆ QÑ"• ŽE !] !6ô_[#ôI× ‹E 2 F#ÖQÑX3 Õ5 !]#ôI× Œ •.]+í#ôI×_z!LQÚ"† Pä'> Û

z #ó;L_[



z +• 4_[

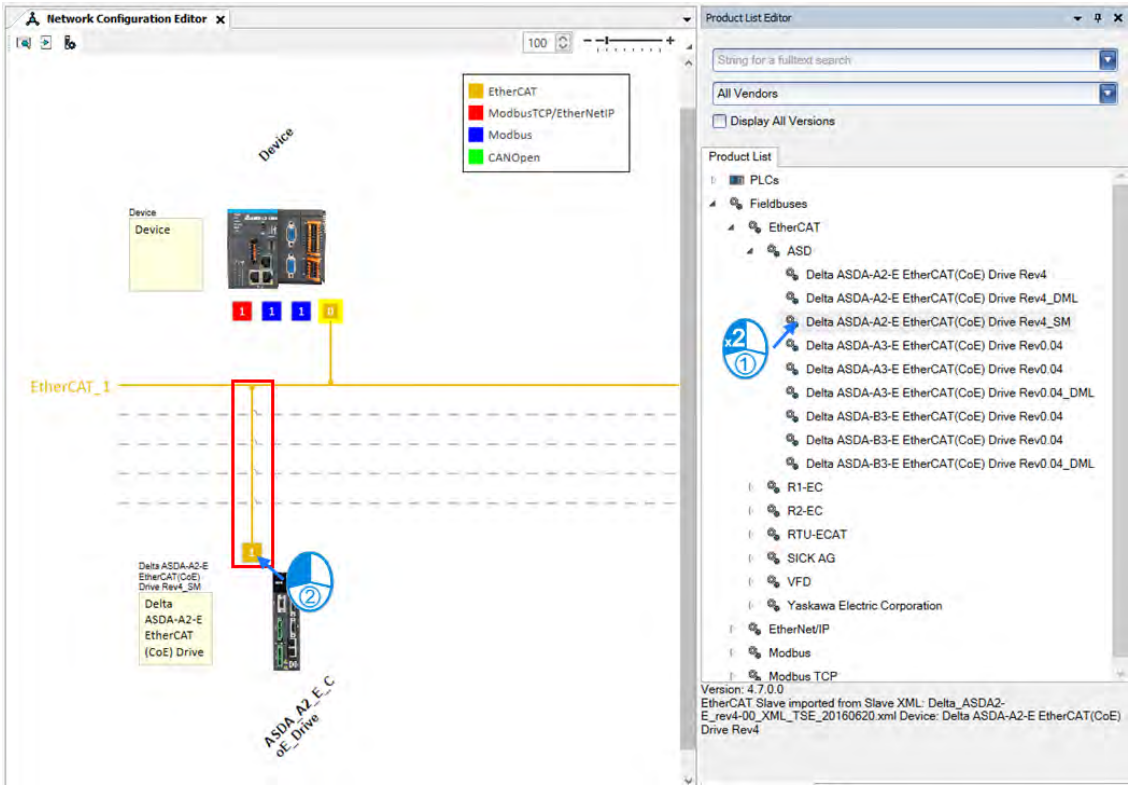


7.4.3 " ^2` N,;ÿHÉ ÌZ|*X:#ib

„ _[[¥+•=(Iò)i ò&å2'I! •PLC h`FÕ.áJ²N-`Ï=(Iò[Þ#©OêIê 7.2 Q@^Ž!fg7E¬-¸I‰;ÿHÊÐ

„ .ç$ h`FÕ#õ[¥+• EtherCAT •i}!/#<!â åNet work Configuration æÊ

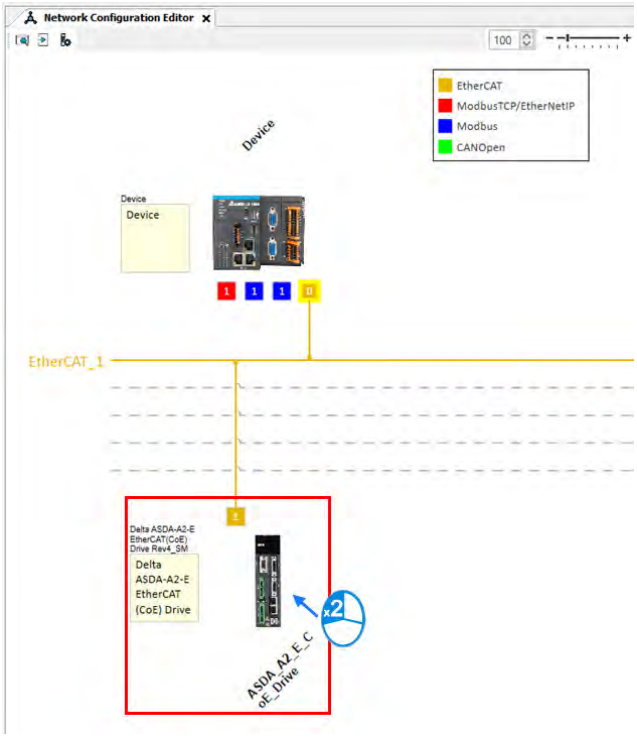
„ _Â!L Network Configuration E"gI#õ#<!âåD elta ASDA-A2-E EtherCAT(CoE) Drive Rev4_SM æ¼ Æ !t+í P;7!QÚ ñ5 Û



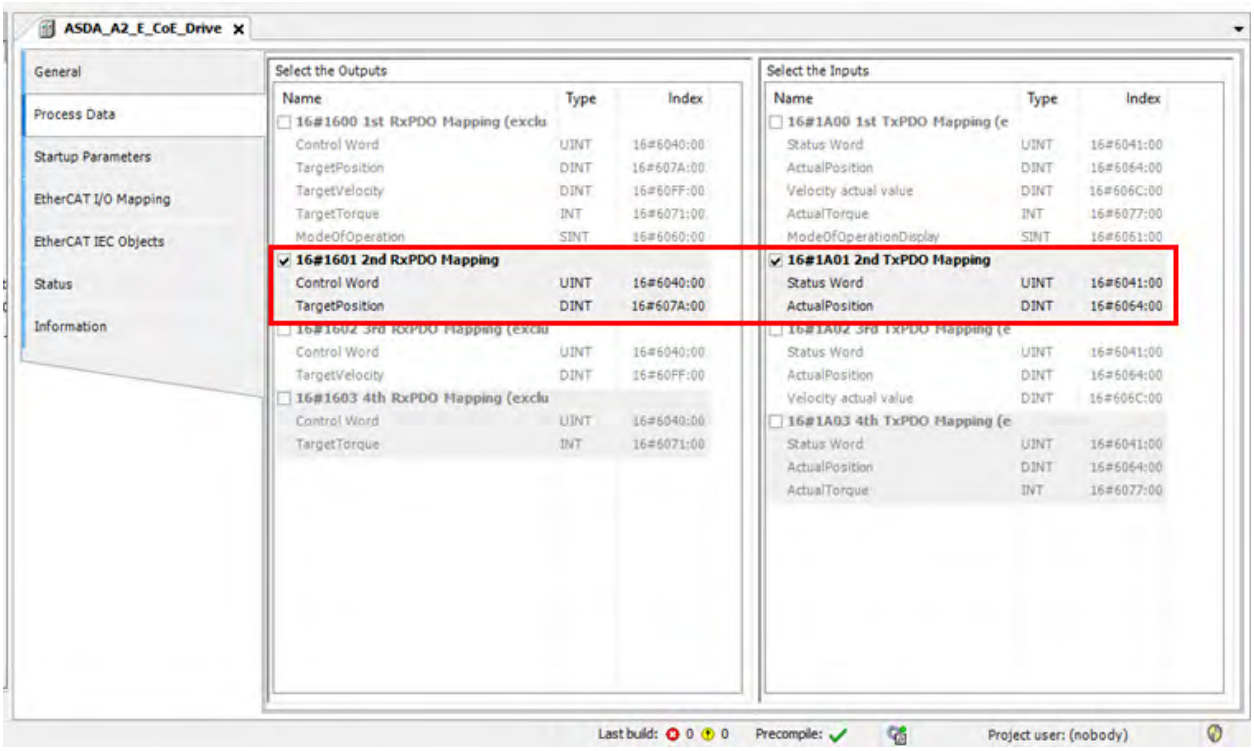
<Ï •

*1 Delta ASDA-A2-E EtherCAT(CoE) Drive Rev4_SM !#ó;L_[•)ifç5—(…+• 4_[[Þ_ð2Ð Delta ASDA-A2-E EtherCAT(CoE) Drive Rev4_DML #õNÔ"• CFm !Fß#ó Û

„ +s1÷_[.áJ²#õ •[Þ fE o 7î-Íe #³!â; [¥+• 2 !6ô µJÀ Û

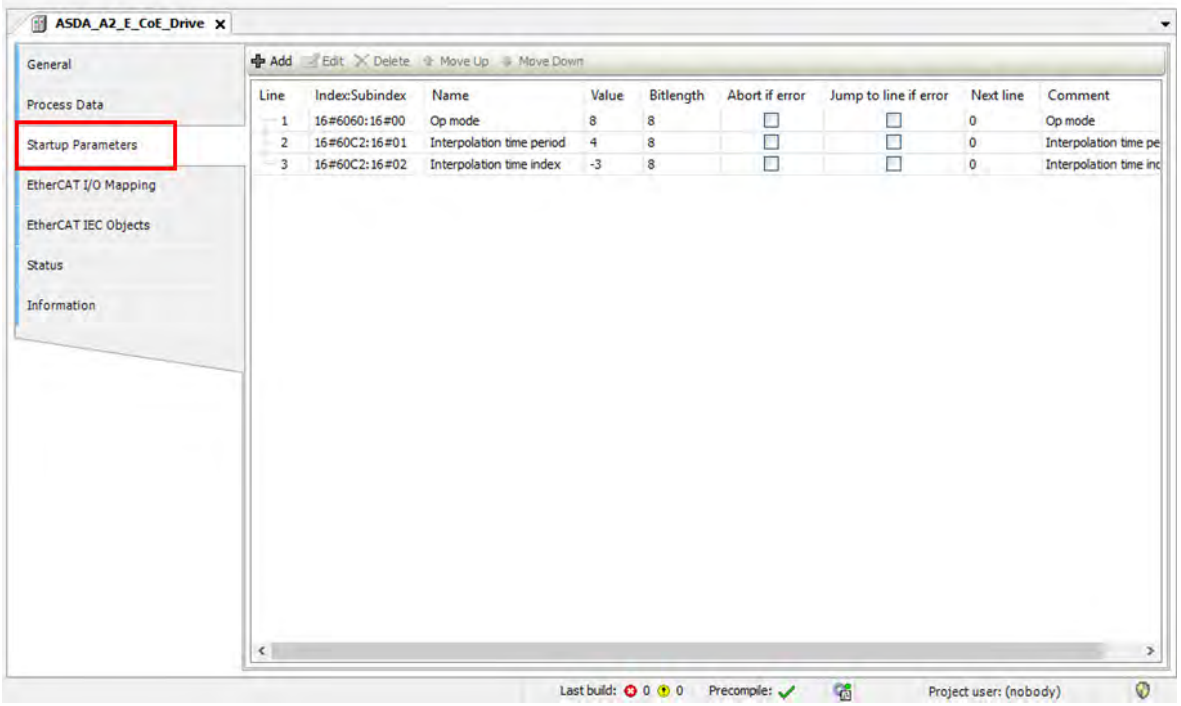


„ [Þ!î3Ih\gIQÚ å Process Data æ[¥+•!] PDO 6 +ëN«" Û#×_¥ASDA-A2 n¿[‹N«" !K 2 N« •) `Ï ä_·"• "†Pä'> fK 2 N«#Z#Ö;J. _·X3 •RÌ"†Pä'>fçh„(ý_ð+•N«" / 5—(.PDO #©5W •[Þ#©OŒX K¹ Õ^Ž!f2e ô1Å ¢ 1 J#ë"†Pä'>!l+ [Û5õ Û

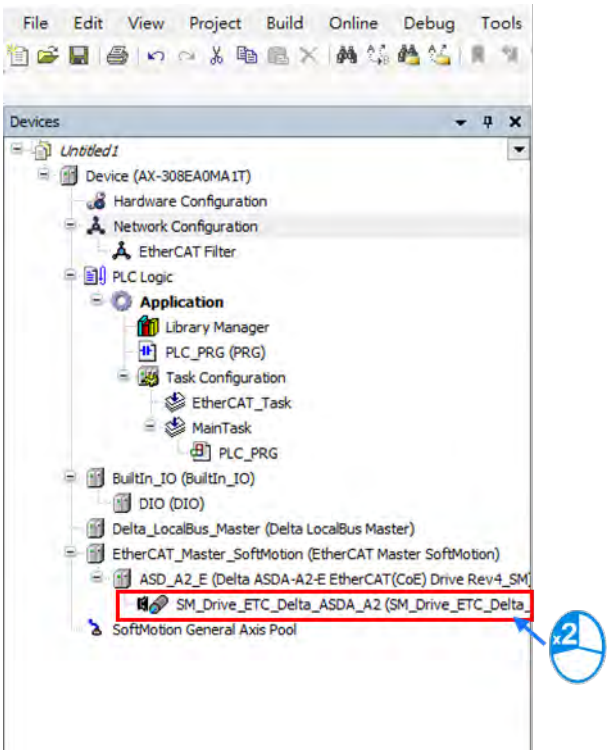


„ EtherCAT ` [–")²"ý[¥+•

RÌ !6ô µJÀ' ;¶; ")²"ý+s1÷#õ ¶çdo+à2'fçFk+à\H_…!_‹Object Dictionary Œ€L &á+• # ¶#Ö' å Startup Parameters æh\gI _ÂX3[¥+• Û

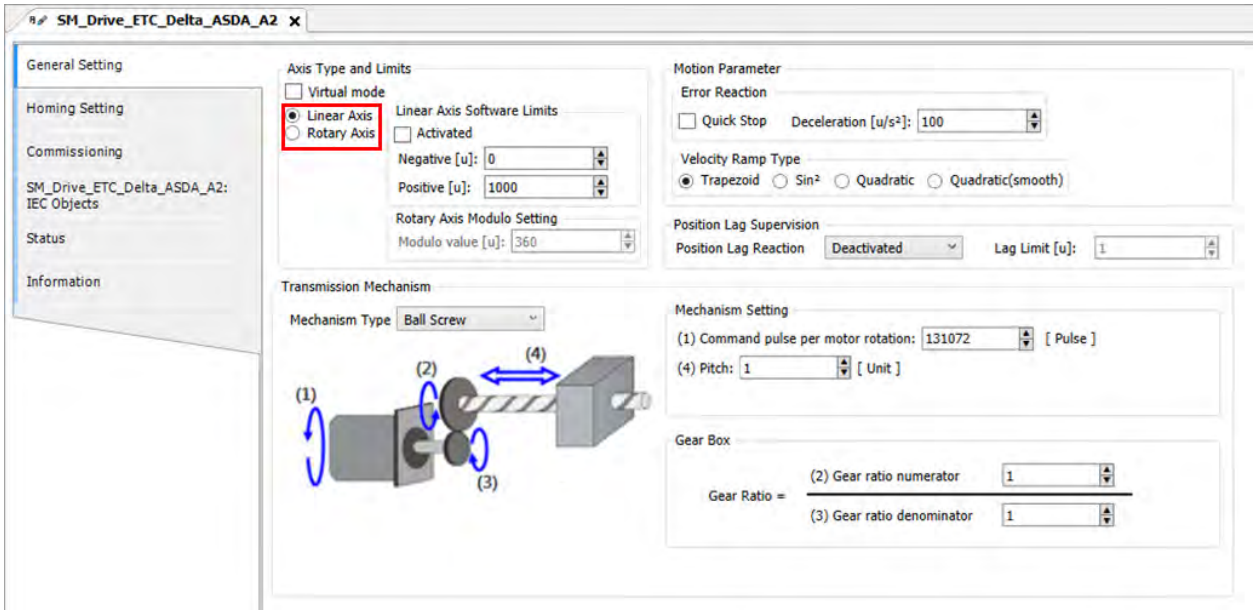


„ +í_[` [–Fß!Z[¥+•+s;¼#õ!t#<!â å SM_Drive_ETC_Delta_ASDA_A2 æ-Íe ò Û

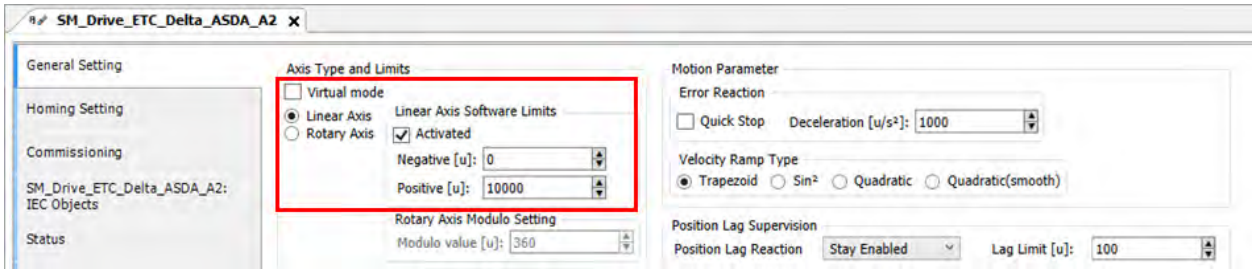


„ _[[¥+•E"gI

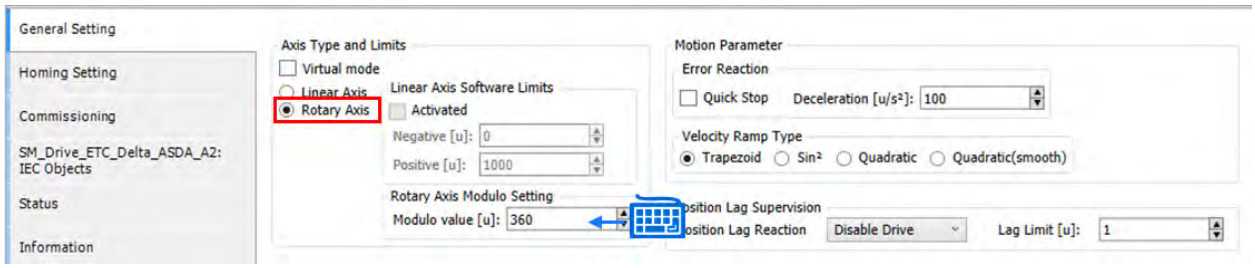
_[: .ö[¥+• •5²_S_[å Rotary Axis æ•FÛN¦_[åLiner Axisæ



„ [¥+•FÛN¦_[_V Ý7hf7 åSoftware limits æ/:"å_ð Activated #õ $ "•_V Ý7hf7 •å Negative æ !#´7hf7 Ú åPositive æ !;J7hf7 Û



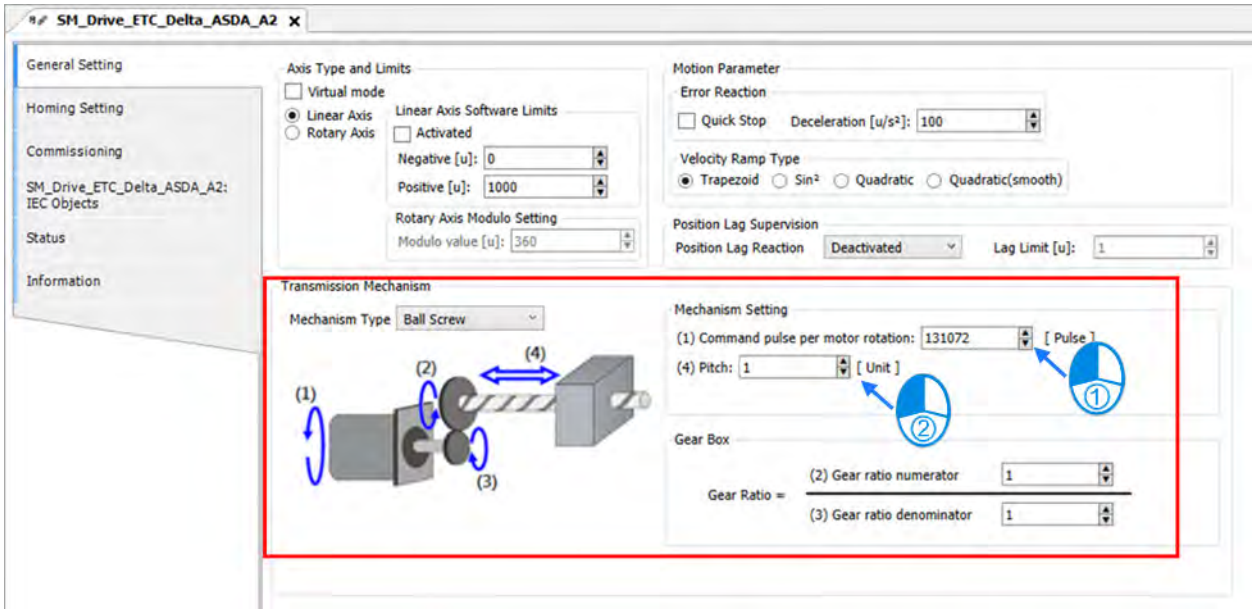
„ [¥+•5²_S_[#õhb+• 05²_SRê&Û •[Þ' åModulo settings æ [¥+•5²_S_[Rê&Û åModulo value æÛ



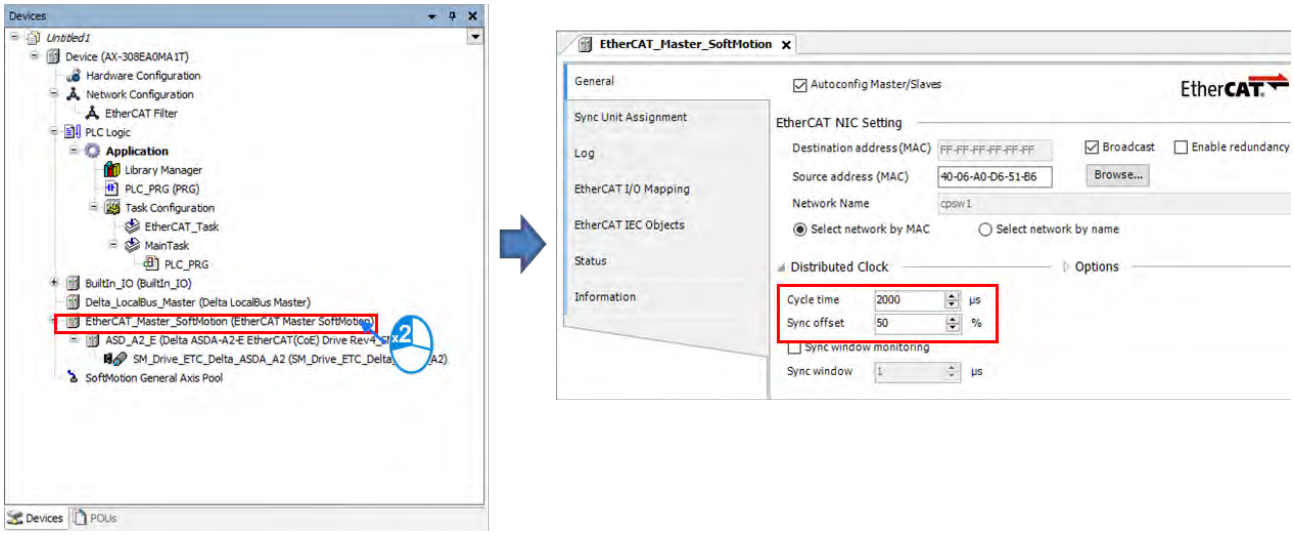
„ Scaling/Mapping E"gI

[¥+•E 7! ç&ïPð!™ a¶ åCommand pulse per motor rotation æ

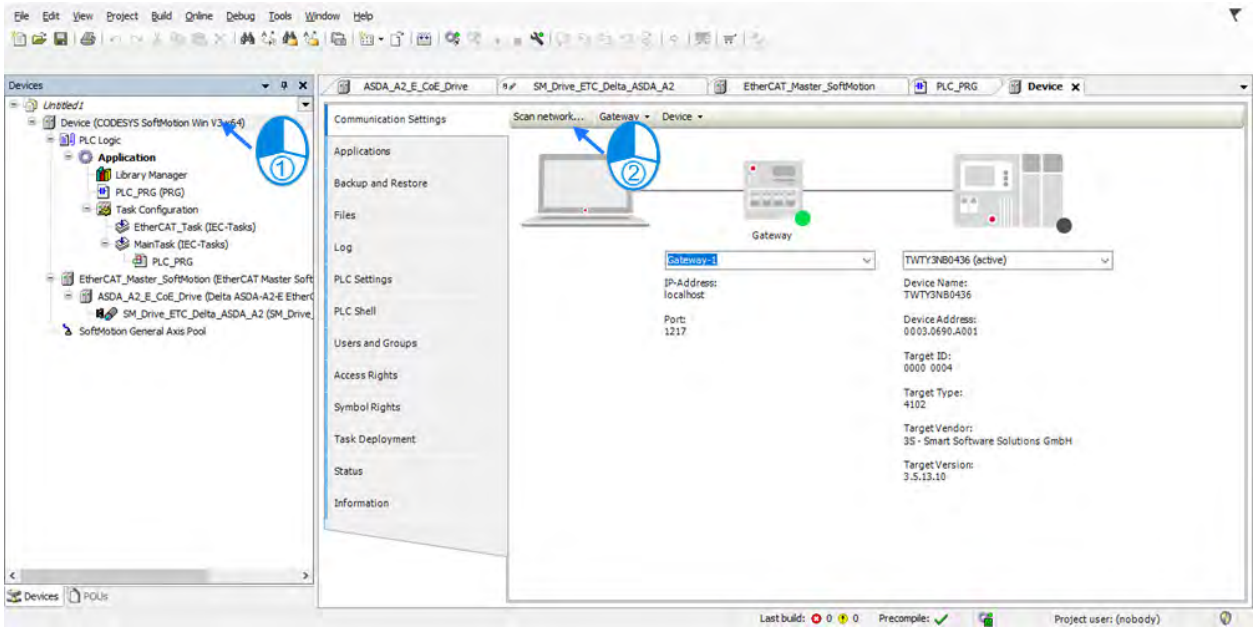
[¥+•E 7! ç&ïlâ"•]ÄI¢ åPitch æ



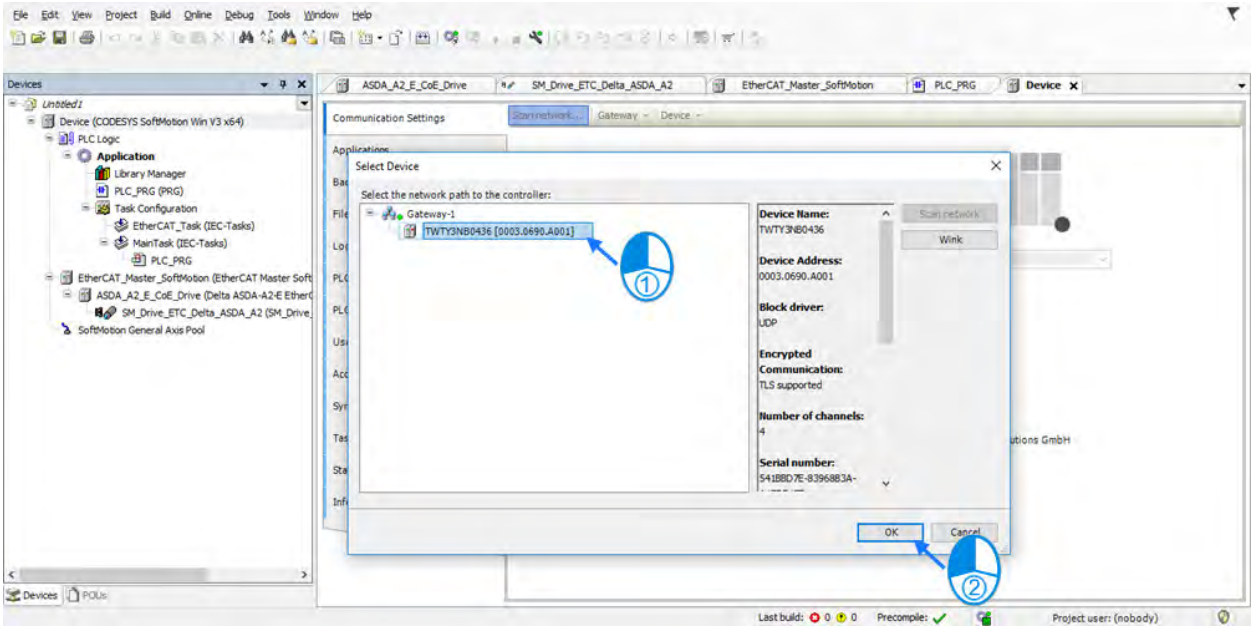
„ [¥+• EtherCAT ` [–$O7 •#<!â åEtherCAT_Master_SoftMotion æ#õ!t Cycle time = 2000 • Sync offset = 50Û AX-308 6ç) 5 2è 8 _[•.á[•[¥+•5ÝeÛ ! Cycle time = 2000 • Sync offset = 50 Œ



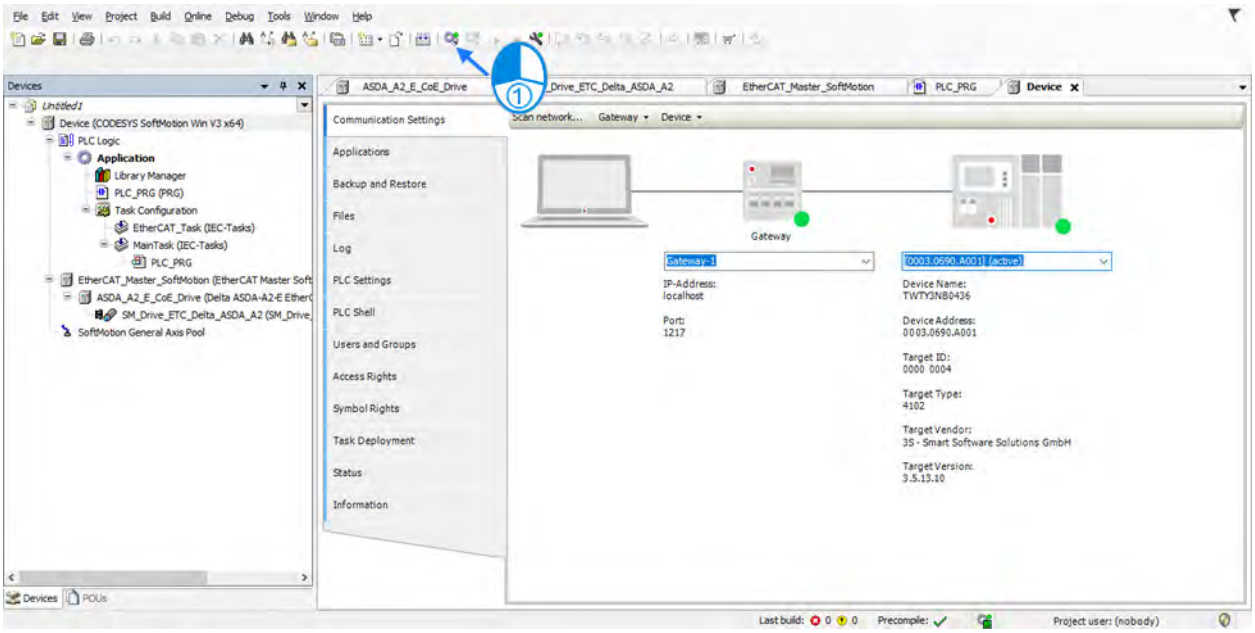
„ 2R3¶PLC 3Ž" &O



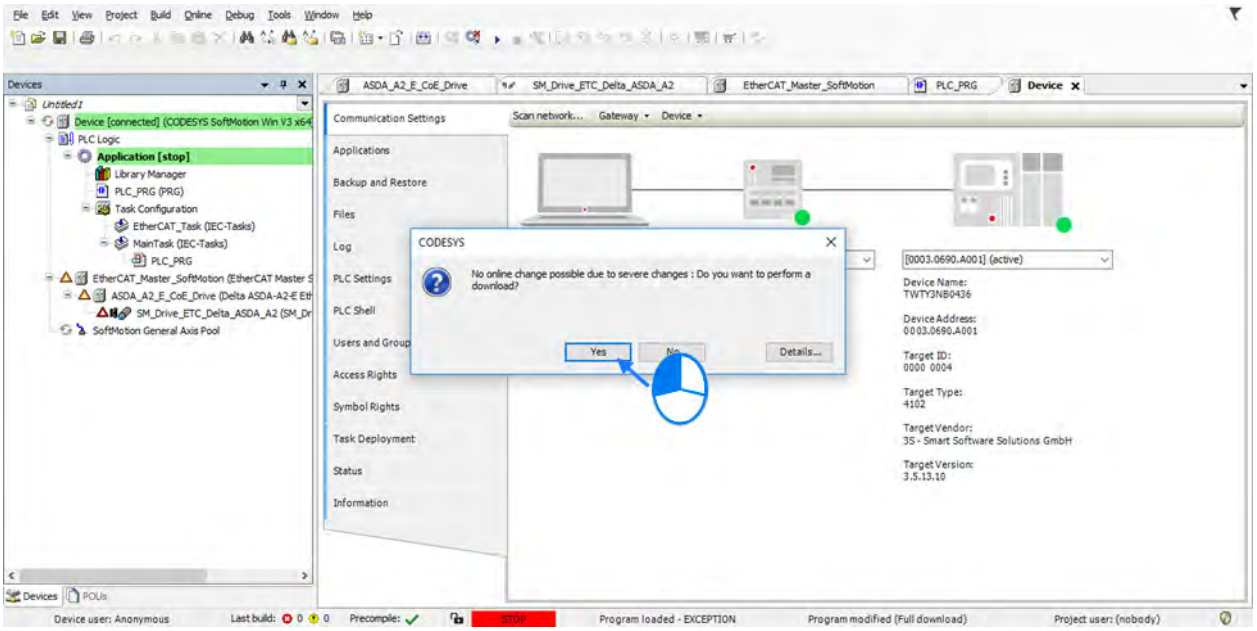
„ 5—(…2R" FRLC 3Ž" &O#õ#<!âOK



„ 5—(…+ßLC #õ !áC—Næ@VK #ÞHU[‹-ÙP;7! ñ •!t#<!âLogin Û



„ #<!â+s Login #õ !áC—6 $ ò_dIò.v •!t#<!â YES Û


File Edit View Project Build Online Debug Tools Window Help
Devices
Untitled1
Device [connected] (CODESYS SoftMotion Win V3 x64)
PLC Logic
Application [stop]
Library Manager
PLC_PRG (PRG)
Task Configuration
EtherCAT_Task (IEC-Tasks)
MainTask (IEC-Tasks)
PLC_PRG
EtherCAT_Master_SoftMotion (EtherCAT Master S
ASDA_A2_E_CoE_Drive (Delta ASDA-A2-E Eth
SM_Drive_ETC_Delta_ASDA_A2 (SM_Dr
SoftMotion General Axis Pool
Devices
POUs
ASDA_A2_E_CoE_Drive
SM_Drive_ETC_Delta_ASDA_A2
EtherCAT_Master_SoftMotion
PLC_PRG
Device
Communication Settings
Applications
Backup and Restore
Files
Log
PLC Settings
PLC Shell
Users and Groups
Access Rights
Symbol Rights
Task Deployment
Status
Information
Scan network...
Gateway
Device
CODESYS
No online change possible due to severe changes : Do you want to perform a download?
Yes
No
Details...
[0003.0690.A001] (active)
Device Name:
TWTY3NB0436
Device Address:
0003.0690.A001
Target ID:
0000 0004
Target Type:
4102
Target Vendor:
3S - Smart Software Solutions GmbH
Target Version:
3.5.13.10
Device user: Anonymous
Last build:
Precompile:
STOP
Program loaded - EXCEPTION
Program modified (Full download)
Project user: (nobody)

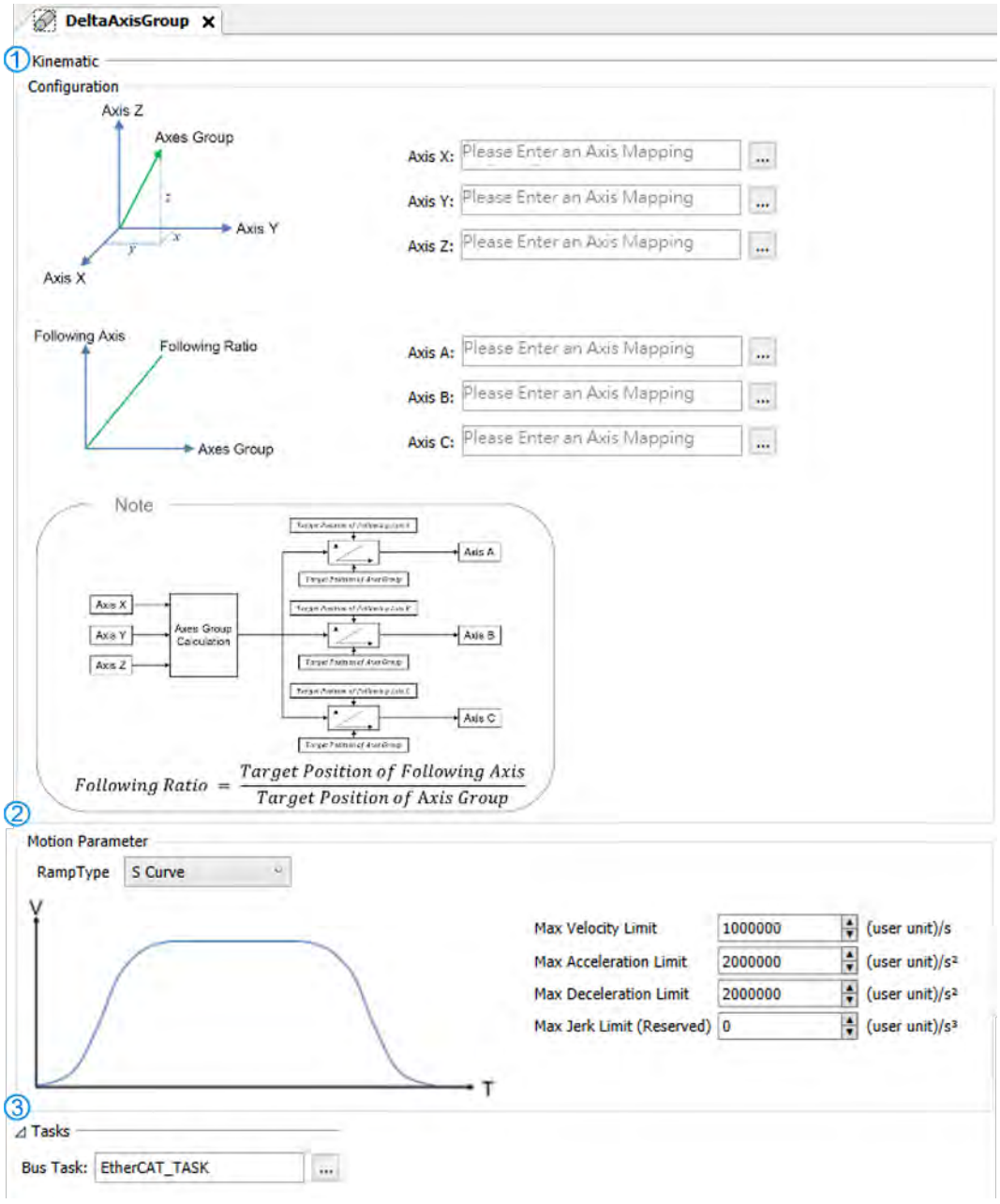
7.4.4 ^2M,Z|*X

#ó5Ý2NX3) _[.] ûFÛN¦3¹XL õW¡5²3¹XĽ"†Pä5Ý, fçYh fE _[N«_·"• fç` _® DIADesigner-AX+í_[[¥+• !_[N« Û

2e ô^24.	E²M}2•W#2e ô5¾'å^24.	6 _[
	%Ä-å2•W#2e ô^24.	6 _[‹3 _[]Æfv_[Œ

7.4.4.1 ^2M,"€4. ‰M‹

_[N«_·"•2' fE " Fk#©5W)i ò •



„ c Kinematic

"ËH®	!]O»
Axis X*1	_[N« X _[
Axis Y*1	_[N« Y _[
Axis Z*1	_[N« Z _[
Axis A*1	_[N« A _[
Axis B*1	_[N« B _[
Axis C*1	_[N« C _[

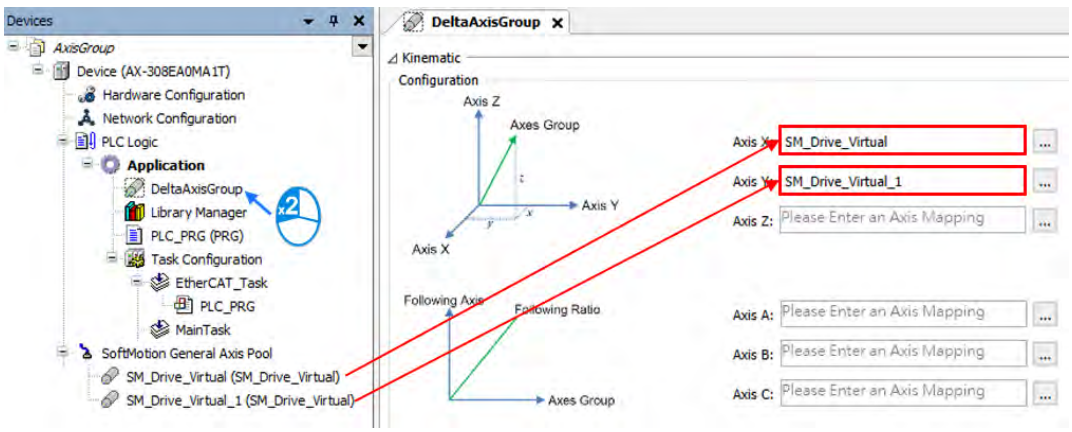
„ d Motion Parameter

"ËH®	!]O»
Ramp Type*•	` .•6ÙN¦Lb'r
Max Velocity Limit*¯	_[N«6ç) ` .•
Max Acceleration Limit*¯	_[N«6ç) "‡` .•
Max Deceleration Limit*¯	_[N«6ç) !¶` .•
Max Jerk Limit ‹Reserved Œ¯	_[N«6ç) "‡` .•Fk#¿"ýCn ‹]ª.• Œ;K"†Pä ÄE@ Œ

„ e Tasks

"ËH®	!]O»
Bus Task	[¥+•_[N«6Û5—Task

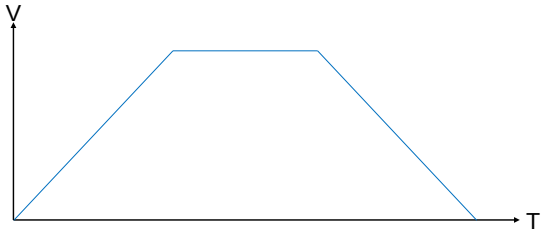
<Ï 1 •Axis X ~ Axis C •_z!L#<_[#ôI×



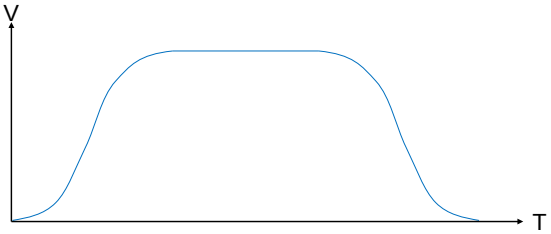
7

<Ï 2 •Ramp Type •: .ö6ð Trapezoid õ S Curve l´6ÙN¦ •6ÙN¦6%l! ! Ì ò l´ •

„ Trapezoid



„ S Curve



<Ï 3 •

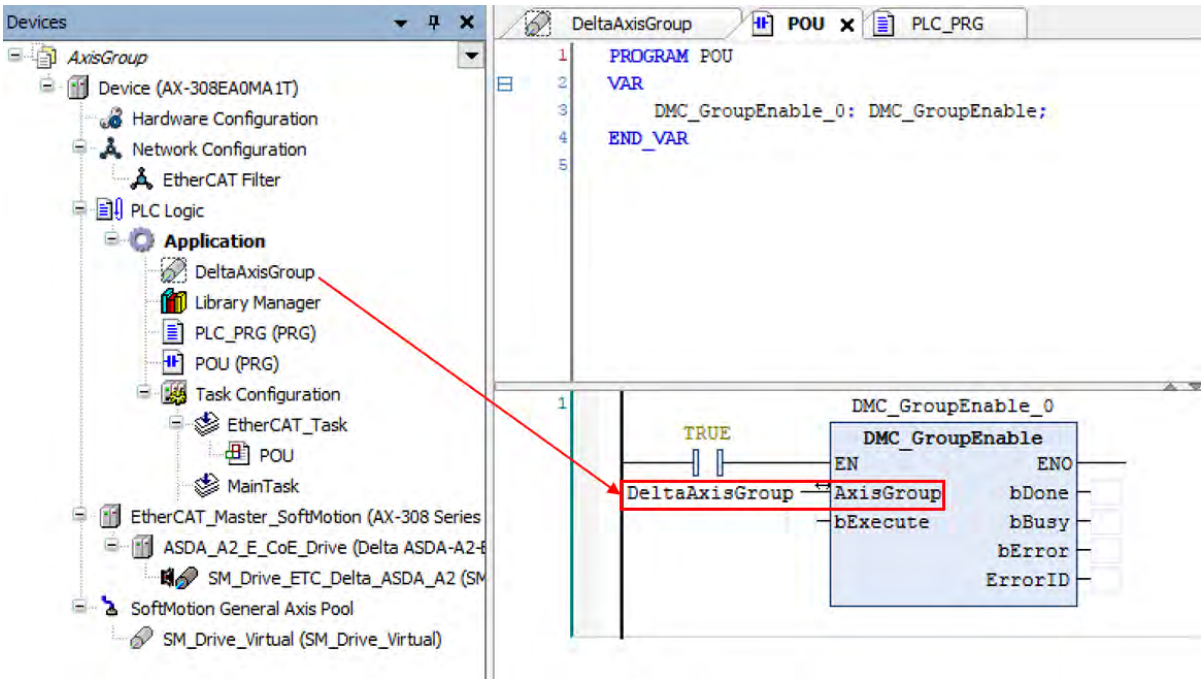
„ Max Velocity Limit •/:_[N«_·"•` .•]l_®[¥+•#©5W, 2Œe Û

„ Max Acceleration Limit •/:_[N«_·"•"‡` .•]l_®[¥+•#©5W, 2Œe Û

„ Max Deceleration Limit •/:_[N«_·"•!¶` .•]l_®[¥+•#©5W, 2Œe Û

7.4.4.2 HÉ-M ë =Cæ^2M,

Iò.v ' fE _[N«"†Pä'>"4 •fç' h`FÕ7øB• 5—(…_[N«Ri@ .][¥+•[Ì_[N«fç fE " Fk#<_[#ôI× •[¥+•+s1÷ #õ[Þ+í[Ì_[N«FkRi@ #ôI×2î#øQÚ_[N«#ë"†Pä'>FkxisGroup.üQ Û

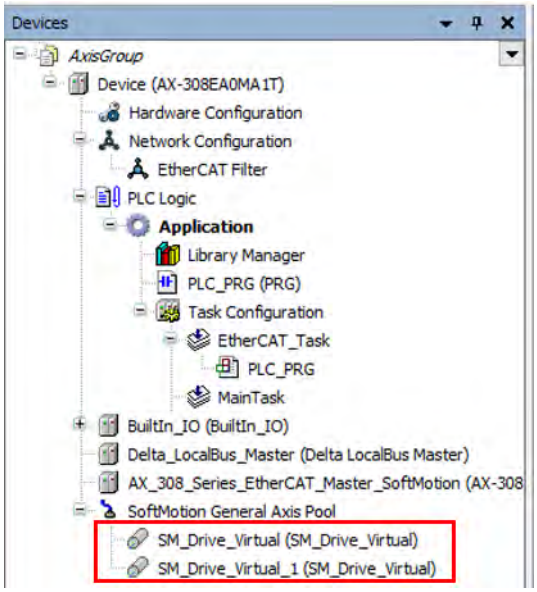


7.4.5 ^2M,` N,;ÿHÉ ÌZ|*X:#ib

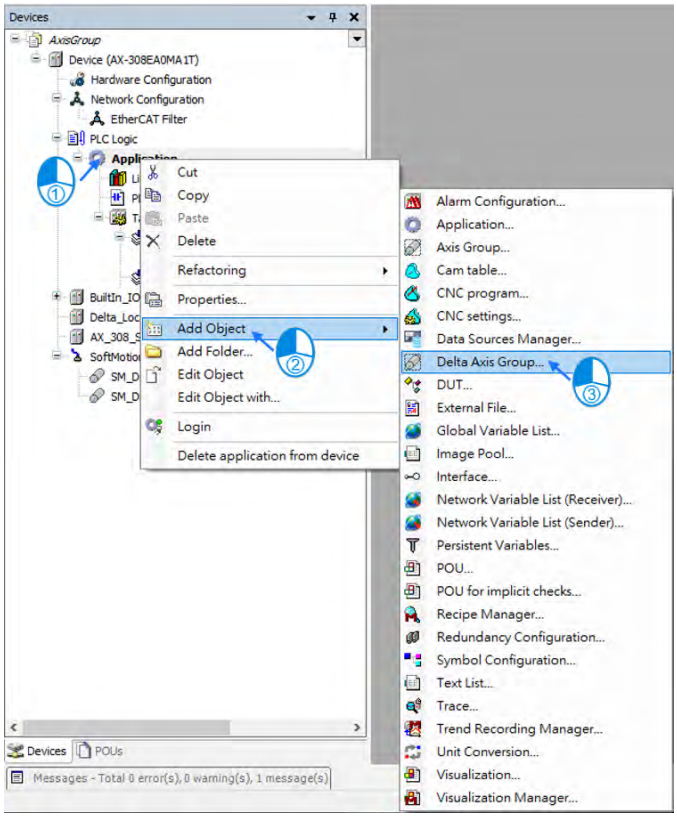
„ fE _[N«_·"•fçYh` _® DIADesigner-AX [¥+•_[N«#ôI× õ+à.{ " _[•_[N«.áJ²=(Iò&å)i ò •

„ Iò.v.áJ²_[N«;Lj‹

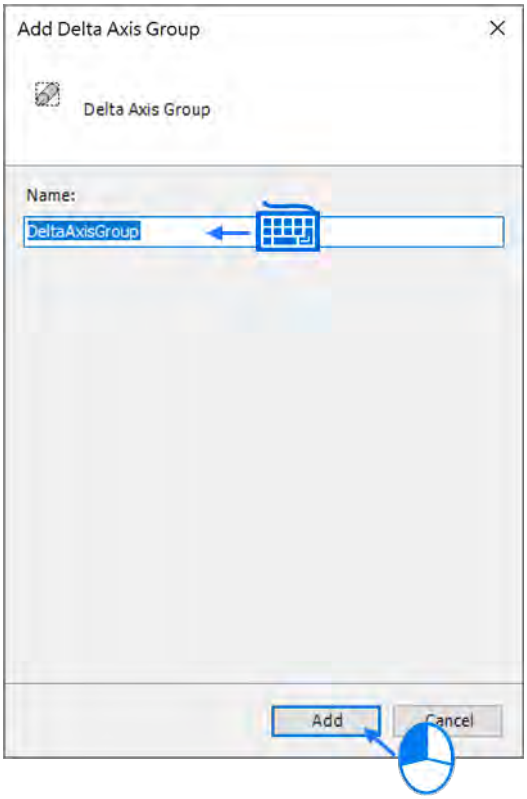
- 5—(…#<_[•;K=(Iò Ì.áJ² 2 VA_[! r Û



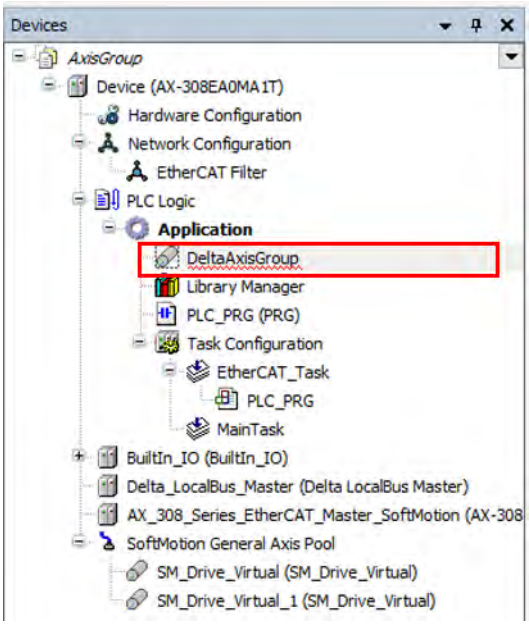
- .áJ²+s1÷#õ[Þ u å Application æ#<!âo 7î#Úe #õ#<!â2Ð åAdd Object æ Æ åDelta Axis Group æÛ



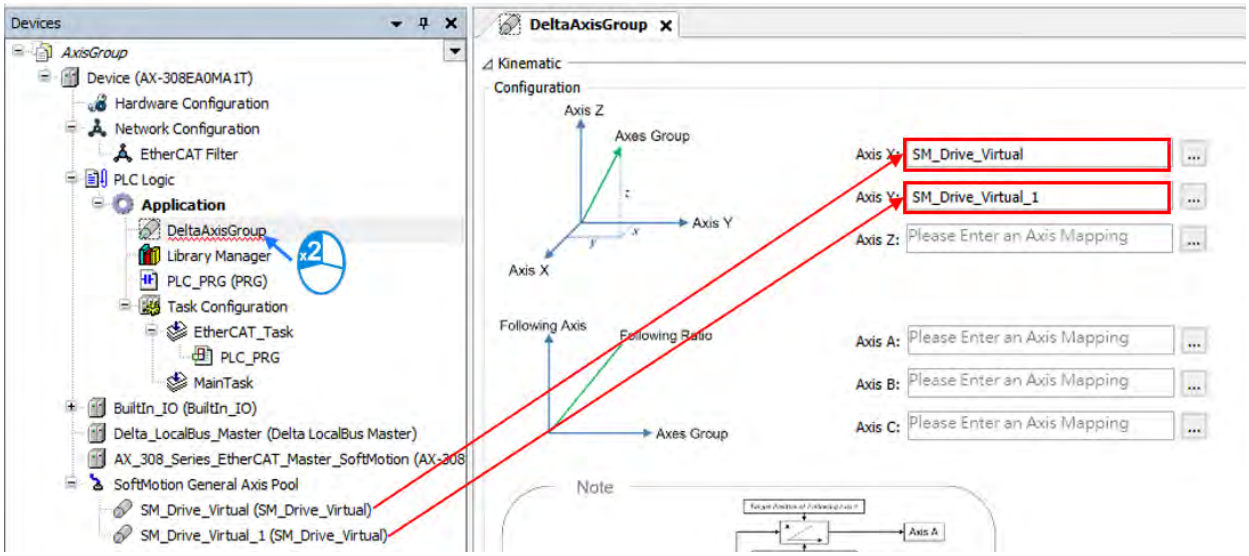
- ' åAdd Delta Axis Group æE"gI[¥+•#ôI×!t#<!â åAdd æÛ



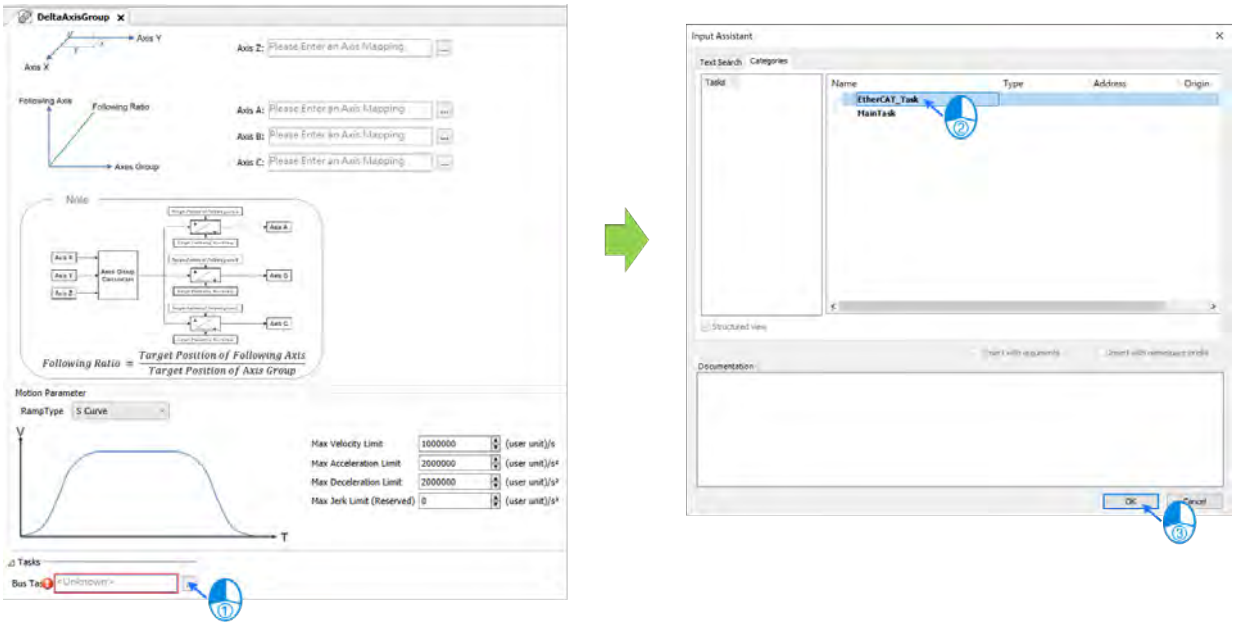
- ;K5Ý-Í_ h`FÕ7ø !áC— åDeltaAxisGroup æÛ



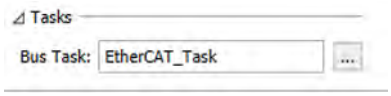
- #<!â åDeltaAxisGroup æ#õ+í _[VA_[#ôI×_z!LQÚ åAxis X æ õ å Axis Y æÛ



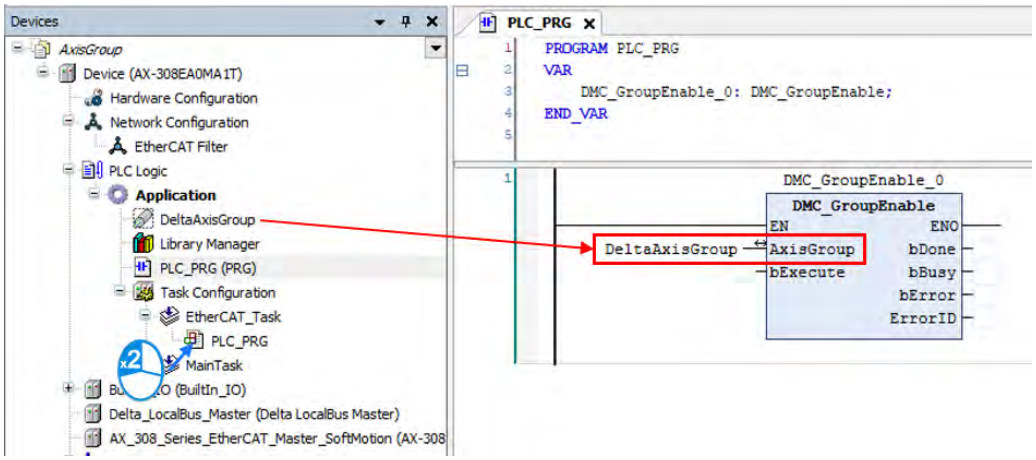
- +í Axis #ôI×(R!€+s;¼#õ •!t#<!â å Bus Task æÛ_Â!L å Input Assistant æE"gI_ð2Ð åEtherCAT_Task æ #õ#<!â åOK æÛ



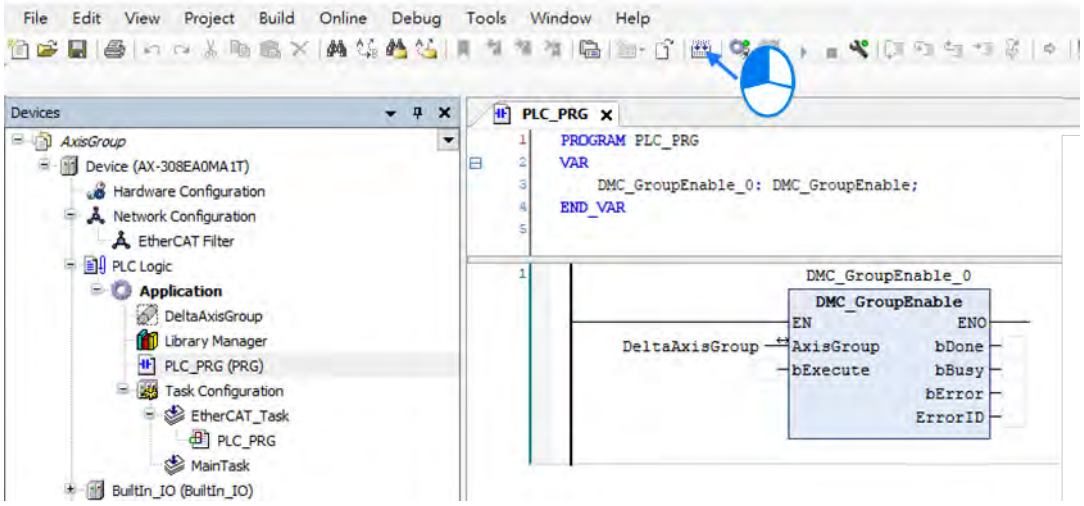
- [¥+• Task +s;¼#õ • !áC— åEtherCAT_Task æÛ



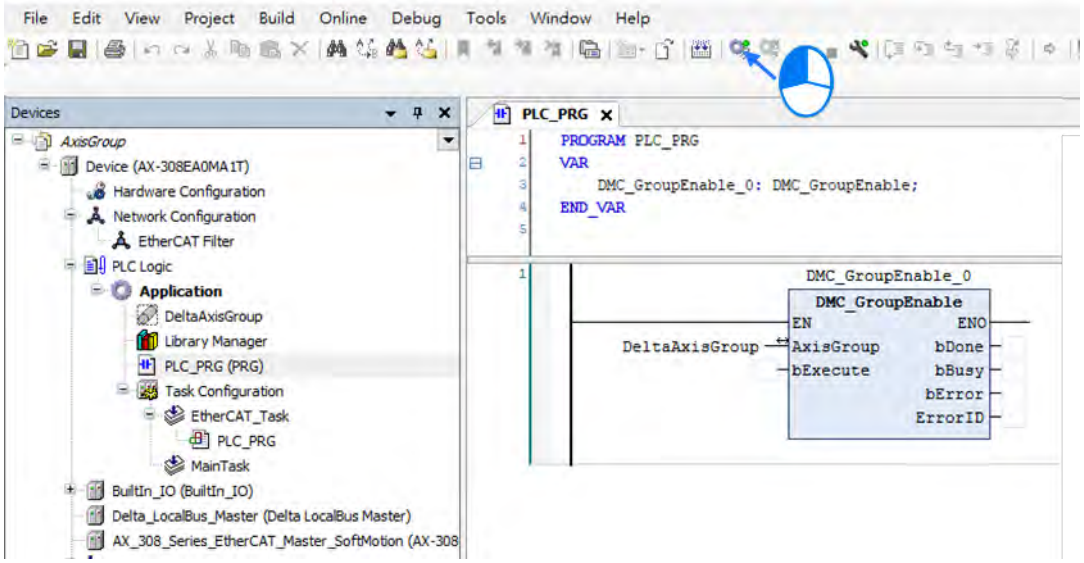
- ' åPLC_PRG æ!l5—(… åDMC_GroupEnable æ"†Pä'>.]' å AxisGroup æ.üQ (R!€_[N«#ôI× Û



- /:lò.vNý!€ +s;¼#õ •#<!âNý[¸.]HU[‹6 $ 6ðe [Ö Û



- HU[‹Ný[¸#õRÌ5Çe [Ö •!t#<!â ' N¦F¸3Ž, #Ö Ì ò_dIò.v Û



7.5 ^Ž!f^2"–`•

7.5.1 " ^2"–4.

' _V Ý DIADesigner-AX h`FÕ7ø .áJ²_[#õ • QÑ"• ŽE +à.{Fk_[#©5W •_[#©5W ¬ ,[â#½ fE •_[!í1÷#ó ;L_[‹ Axis_REF_SM3 Œ õ+• 4_[‹ Axis_REF_DML Œ• òXO !_[#©5W!l+ •

z #ó;L_[‹ Axis_REF_SM3 Œ

Ný#Þ	#ôI×	5W3ULb'r	n¿[‹ #	[Û5õ
1000	nAxisState	SMC_AXIS_ STATE ‹INT Œ	Standstill ‹3 Œ	6%l!/:"4_[B•/è7!
1012	bCommunication	BOOL	FALSE	/: EtherCAT _[` [–;J. 5Ý True •)i 7ƒ5”N¦ m ! False
1014	uiDriveInterfaceError	UINT	0	)i7ƒ Driver Interface 8§=2" e [Ö 6% l!!]+à.{ 2e [ÖGè
1021	wDriveId	WORD	Driver	Fieldbus #ÞGè
1025	fTaskCycle	LREAL	Driver	EtherCAT â"^$O7 5ÝeÛ
1035	fbeFBError	ARRAY [0..g_SMC_ NUMBER_ FB_ ERRORS] OF SMC_FB ERROR	0	_[Fß!Ze [ÖXO
1040	bVirtual	BOOL	FALSE	VA_[Fk5Ý ;KB•/è ! True +…_[! False
1051	iRatioTechUnitsNum	DINT	1	_[[¥+•_S3Iof_U;» ‹!í;´ Œ
1052	dwRatioTechUnits Denom	DWORD	1	_[[¥+•_S3Iof_U;» ‹!í+7 Œ
1060	iMovementType	INT	1	0 = 5²_S_[1 = FÛN¦_[
1061	fPositionPeriod	LREAL	1000	5²_S_[Fk6ç) Iâ"•]ÄI¢
1062	eRampType	SMC_RAMPTYPE	Trapez	[¥+•_[Ramp 'r.ö • „ Trapezoid „ sin^2 „ Quadtatic „ Quadtatic ‹smooth Œ
1100/1	fSetPosition	LREAL	0	$d Ë 4OU ‹#< 4 •E 2 #< 4 Œ
1101	fActPosition	LREAL	0	#´io 4OU ‹E 2 #< 4 Œ
1110,11	fSetVelocity	LREAL	0	$d Ë` .• ‹E 2 #< 4/s Œ
1111,10	fActVelocity	LREAL	0	#´io` .• ‹E 2 #< 4/s Œ
1115	bConstantVelocity	BOOL	FALSE	/:` .• !K0` 5Ý6%l! ! True
1120	fSetAcceleration	LREAL	0	"‡` .•$d Ë ‹#< 4 •E 2 #< 4/s^2 Œ

Ný#Þ	#ôI×	5W3ULb'r	n¿[‹ #	[Û5õ
1125	bAccelerating	BOOL	FALSE	_[' "‡` B•/è5Ý ! True
1135	bDecelerating	BOOL	FALSE	_[' !¶` B•/è5Ý ! True
1140	fSetJerk	LREAL	0	$d Ë"‡` .•Fk#¿"ýCn ‹]ª.• Œ
1160	fSetTorque	LREAL	0	$d Ë2TGÐ ‹NmŒ
1161	fActTorque	LREAL	0	+…f,2TGÐ ‹NmŒ
1200,2	fSWLimitPositive	LREAL	0	[¥+•_V Ý;J7hf7Rê&Û
120,3	fSWLimitNegative	LREAL	0	[¥+•_V Ý#´7hf7Rê&Û
1204	bSWEndSwitchActive	BOOL	FALSE	/: SW " _¥[¥+• 4OU#õ;KB•/è ! Trueo B•/è7!#¿1÷ ErrorStop
1205	bSWLimitEnable	BOOL	FALSE	_V Ý7hf7.ç!Z •True $ "•/False !ZeÔ
-	strDriveInterfaceError	STRING	‘’	_[e [Ö

z +• 4_[‹ Axis_REF_DML Œ

Ný#Þ	#ôI×	5W3ULb'r	n¿[‹ #	[Û5õ
1000	nAxisState	SML_AXIS_ STATE	SML_AS_PowerOff ‹0 Œ	6%I!/:"4_[B•/è7!
1012	bCommunication	BOOL	FALSE	/: EtherCAT _[` [–;J. 5Ý True •)i7ƒ5”N¦ m ! False
1014	uiDriveInterface Error	UINT	0	)i7ƒ Driver Interface 8§=2" e [Ö 6%I!!]+à.{ 2e [ÖGè
1051	iRatioTechUnits Num	DINT	1	_[[¥+•_S3Iof_U;» ‹!í;´ Œ
1052	dwRatioTechUnits Denom	DWORD	1	_[[¥+•_S3Iof_U;» ‹!í+7 Œ
1060	iMovementType	SML_Movement Type	SML_MT_MODULO	_[Lb'r SML_MT_MODULO = 5²_S_[SML_MT_FINITE = FÛN¦_[
1062	eRampType*1	SMC_RAMP TYPE	Trapez	[¥+•_[Ramp 'r.ö • „ Trapezoid „ sin^2
1101	fActPosition	LREAL	0	&Å3o 4OU ‹E 2 #< 4 Œ
-	strDriveInterface Error	STRING	‘’	_[e [Ö

<Ï 1: ¬5 2è Trapezoid Úsin^2 Û

7.5.2 ^2M,"–4.

' _V Ý DIADesigner-AX h`FÕ7ø .áJ²_[N«#õ •LâNÆ QÑ"•.áJ²+à.{Fk_[#¿a¶ Û_[N«#¿a¶)i òXO2'I! •

#ôI×	5W3ULb'r	[¥+• # ‹n¿[‹ # Œ	"†Pä
GroupState	DMC_ GROUP_ STATE	GroupDisabled / GroupStandby / GroupMoving / GroupHoming / GroupStopping / GroupErrorstop ‹GroupDisabled Œ	_[N«FkB•/è$d Ë
bError	BOOL	TRUE / FALSE ‹FALSE Œ	/:_[N«6ðe [Ö5Ý ! TRUE
dwErrorId	DMC_ ERROR	DMC_ERROR ‹DMC_GM_NO_ ERROR Œ	[ÍN-Fke [Ö3¶_×
lrVelocity	LREAL	0 ~ 1.798E+308 ‹0 Œ	_[N«/:"4` .•
lrAcceleration	LREAL	;J5W Ú] 5W1ýfÝ ‹0 Œ	_[N«/:"4"‡` .•
lrJerk	LREAL	;J5W Ú] 5W1ýfÝ ‹0 Œ	_[N«/:"4"‡` .•Fk#¿"ýCn
bAccelerating	BOOL	TRUE / FALSE ‹FALSE Œ	/:"‡` .• ! TRUE
bDecelerating	BOOL	TRUE / FALSE ‹FALSE Œ	/:!¶` .• ! TRUE
bConstantVelocity	BOOL	TRUE / FALSE ‹FALSE Œ	/:K0` 5Ý ! TRUE ‹"ì$ ` .•= 0 Œ
bInPosition	BOOL	TRUE / FALSE ‹FALSE Œ	/:+• 4+s;¼ ! TRUE
bContinueDataWri ten	BOOL	TRUE / FALSE ‹FALSE Œ	/:_[N«_·"•X'6i C#õFß!Z5W3U#Ö , DMC_GroupContinue fE 5Ý ! TRUE
ContinuePos	ARRAY [0..5] OF LREAL	[0,0,0,0,0,0]	/: DMC_GroupInterrupt 2NX31÷"† •[—/<_[N«/:"4 4OU
AxisX_Name*	String		6%I!' /:"4_[N« u Axis_X 2' fE Fk_[#ôI×
AxisY_Name*	String		6%I!' /:"4_[N« u Axis_Y 2' fE Fk_[#ôI×
AxisZ_Name*	String		6%I!' /:"4_[N« u Axis_Z 2' fE Fk_[#ôI×
AxisA_Name*	String		6%I!' /:"4_[N« u Axis_A 2' fE Fk_[#ôI×
AxisB_Name*	String		6%I!' /:"4_[N« u Axis_B 2' fE Fk_[#ôI×
AxisC_Name*	String		6%I!' /:"4_[N« u Axis_C 2' fE Fk_[#ôI×
RampType	DMC_GROUP _RAMP_TYPE	Trapezoid / S Curve	/:"46ÙN¦Lb'r

#ôI×	5W3ULb'r	[¥+• # ‹n¿[‹ # Œ	"†Pä
		‹S Curve Œ	
lrMaxVelocityLimit	LREAL	;J5W1ýfÝ ‹1000000 Œ	6ç) _[N«` .•7hf7
lrMaxAcceleration Limit	LREAL	;J5W1ýfÝ ‹2000000 Œ	6ç) _[N«"‡` .•7hf7
lrMaxDeceleration Limit	LREAL	;J5W1ýfÝ ‹2000000 Œ	6ç) _[N«!¶` .•7hf7
lrMaxJerkLimit ‹Reserved Œ	LREAL	;J5W1ýfÝ ‹0 Œ	6ç) _[N«"‡` .•Fk#¿"ýCn ‹]ª.• Œ;K"†Pä Ä E@ Œ
bVelocityWarning	BOOL	TRUE / FALSE ‹FALSE Œ	/:_[N«` .•]l_®;» r5Ý ! TRUE
bAccelerationWarning	BOOL	TRUE / FALSE ‹FALSE Œ	/:_[N«"‡` .•]l_®;» r5Ý ! TRUE
bDecelerationWarning	BOOL	TRUE / FALSE ‹FALSE Œ	/:_[N«!¶` .•]l_®;» r5Ý ! TRUE
bJerkWarning ‹Reserved Œ	BOOL	TRUE / FALSE ‹FALSE Œ	/:_[N«"‡"‡`]l_®;» r5Ý ! TRUE
StopMethod	Enum of BYTE	Immediate Stop / MaxGroupDecStop / MaxAxisDecStop (Immediate Stop)	[¥+•_[N«e [Ö1ý_·"• 5”5Ý C;I5 <¼
lrVelocityWarning Percentage	LREAL	0 ~ 1 ‹0 Œ	[¥+•_[N«` .•f7" 6ç) ;» r5Ý •6%I!` .•[M $1 •[¥OU 0 !IhE ` .•[M$1 Û
lrAccelerationWarningPercentage	LREAL	0 ~ 1 ‹0 Œ	[¥+•_[N«"‡` .•f7" 6ç) ;» r5Ý •6%I!"‡` .•[M$1 •[¥OU 0 !IhE "‡` .•[M$1 Û
lrDecelerationWarningPercentage	LREAL	0 ~ 1 ‹0 Œ	[¥+•_[N«!¶` .•f7" 6ç) ;» r5Ý •6%I!!¶` .•[M$1 •[¥OU 0 !IhE !¶` .•[M$1 Û
lrJerkWarning Percentage ‹Reserved Œ	LREAL	0 ~ 1 ‹0 Œ	[¥+•_[N«"‡"‡` .•f7" 6ç) ;» r5Ý •6%I!"‡ "‡` .•[M$1 •[¥OU 0 !IhE "‡"‡` .•[M$1 Û
Radius Correction	LREAL	0 ~ 100 ‹0 •1 Œ	[¥OU fE /ª: .öFk&í/ 3¹XL5Ý •[¥OU#1/k Fk!([Ÿ[Ö-Õ ˆ Û [Ö-Õ ˆ = ‹ [/ª] õ[ ]^)²$s N¯;I 4OUFk'iFÛ sK0!íN¦ 2eÛFk]ÄI¢ Œ#1/k Û

<Ï •/:_[Lb" !5²_S_[5Ý •2'[¥+•FkIâ"•]ÄI¢ ôPä]l_® modulo Fk[¥+• # •]l_® 2Œ å Axis limit violated æe [Ö Û

7.6 ^Ž!f2e ôHÉ-MMÔ^O

7.6.1 ^Ž!f2e ôHÉ-M

' DIADesigner-AX Ný!€_·"•3Ž" Iò.v"4 •[Þ!/#©Oê Ì òNý1÷7•7k[Û5õ Û

7.6.1.1 DIADesigner - AX MÔ0Î6t6B ÌH‹K9

' NÆ7•7k •2'6ðFkIò.v •"ì2Ó+7Iò.v`ä!€' #ó ç;œIò.v ÊGè PLC /: Û/:Iò.v0ï7L0ï….) 5Ý •+à uIò .vFkNÛ2‹ õfKe `ä 6 Fß/:) Fk] 2¬ Û' IEC 61131-3 7•7k ò •Iò.v „"†Pä1ýB`0 •X'!í1÷RÌ.Y #<!* • fIò .vFk.ç#¸ õNÛ2‹#¿/~+ 5ú Û&Ç !Iò.vN«N®#<!* ‹ POU ŒFk: '>"ý •&Ç;K ô#óFk POU #ÖE ô#óFk[¥[ˆOì7L.ç#¸ • Pä+àh`FÕFk ¡",Fk!ía4 õ_ÂX3. 7L6%T>Fk5/F± Û' DIADesigner-AX POUs #Ö!í ! ðl´ •Iò.v ‹PROG Œ‡" Pä'> ‹FB Œ#±!ä5W ‹FCŒÛ

1. Iò.v ‹ Program •PROG Œ
   Iò.v POU #Ö „3U!]2î+•Fk-Ì C ‹TASK ŒLb'rOó!š+•!]2U>ûFkY¹RY ÛRÌX'2î+•QÚ$O7 0 Fk-Ì C5Ý •[ÌIò.v POU 2U>ûFk ¦6 "Iò.vFkY¹RY žOóRÌX'2î+•QÚ 5"'rFk-Ì C5Ý •[ÌIò.v POU ¦2U>û 5"+7Iò.vFkY¹RY Û ;K(ý •Iò.v POU •#Ö Ì+à"†Pä'> ‹FB Œ_ÂX3[êEÛ
2. "†Pä'> ‹Function Block •FB Œ
   "†Pä'> POU !l`Ï#Ö Ì+Š$1g@/è'r‹6ð •+?0 Fk ŒFk#¿a¶K #Þ Û&Ç;Kg@/è#¿a¶K #ÞFk #' _·K~ 2#õ#Ö ÌX' Ä 2è •E u2NX35Ý +í"†Pä'>!l`Ï •+?Fk # õ_z!L # ç]^_·K~ •5É f_z!LFk5W #Fß#ó •2'` 1÷Fk_z!á F#ÖPä ô#ó Û;K(ý •"†Pä'>Fk!l`Ï#Ö Ì!t[êE !]+j"†Pä'> Û
3. !ä5W ‹Function •FC Œ
   Function ' POU 7*f76ç+ö F#¾f7" •õ FB Fß;»+j#ÑPä6ð ç !äp;&Å # •û<ˆ6ð fE !l+?JaeÛFk7*f7 Û Function E u_·K~!t+íNº7ƒ&Å Û fE ñ Function #ÑPæêE Function•Óó p9Pæêê FB •†&Ç6 Function .]<ˆ6ð!l+?JaeÛ Û

' .áJ²+s POU #õ •;¶ Iò.v POU '.hb2î+•-Ì C ‹TASK ŒÛ-Ì C ‹TASK ŒE 7L!š+•Iò.v POU 2NX31ý$ "•Fkha.v Û IEC61131-3 Iò.v7•7kB`RY' u+íIò.v!î"Y1÷RÌ.Y BÓJ².ç#¸Fk POU Û/: POUs Ný[¸5Ý • +í2'6ð POUs a´5—3y!þN«#ï ! ç #Ö_÷;L2R3¶Fk2NX3GèÞÛOUs a´5—3y!þN«#ïha.v6 „ANPOUs X'2î=%" Fk-Ì C ‹TASK ŒOó+• Û -Ì C ‹TASK Œ#Ö!í ! ò!þ!ÇI´Lb'r •

- „ Cyclic
- „ Event
- „ External
- „ Freewheeling
- „ Status

[ÍN--Ì C2NX3=(Iò •#Ö#©Oê7 22!sIê 4.4.1 Q@ Û

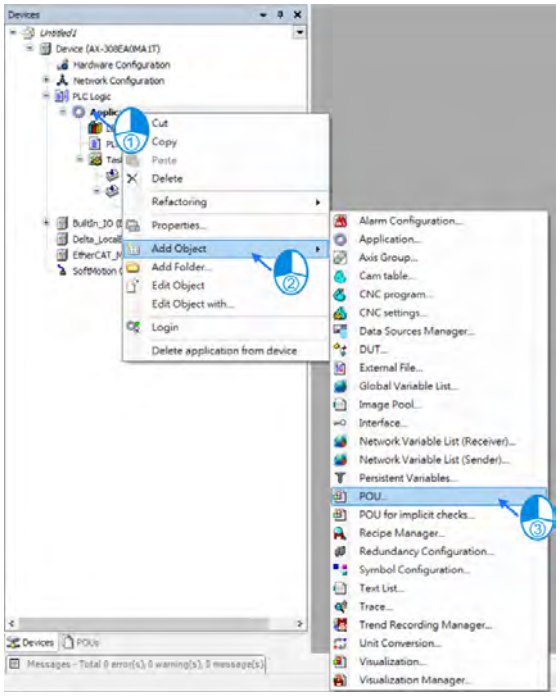
7.6.1.2 DIADesigner -AX ëEB POU

2'6ðE 2 2'.áJ²Fk POU Fm ' h`FÕKˆCí#! X'!þ!á ÛIò.v POU õ"†Pä'> POU X'!í.çKˆCí Û;K(ý •8 3UIò.v POU #±"†Pä'> POU 2'Ný1÷Fk[ÔYç ô#ó •2'6%I!Fk POU &å7î F 6ð2' ô#ó • ;¶ POU #ôI×Fk#õ5 • . !á POU Fß!ZFk È0V Û' h`FÕKˆCí#!Fk POU ñ#³!âo 7î-Íe #Z#Ö.ç$ [Ì POU FkNý_xJ~#Ê ÞOU Ný_xJ~#Ê E `Ï äN«1÷ ÛJ~#Ê ñ#1`Ï !;K POU Fk#!'ÆK #ÞXO •OóJ~#Ê ò#1`Ï" !Iò.vFk " : Û;K(ý •fvG'NýIò[ÔYçFk ô#ó •J~#Ê ò#1`ÏFkNý_xC–(j F fv 2 ô#ó Û

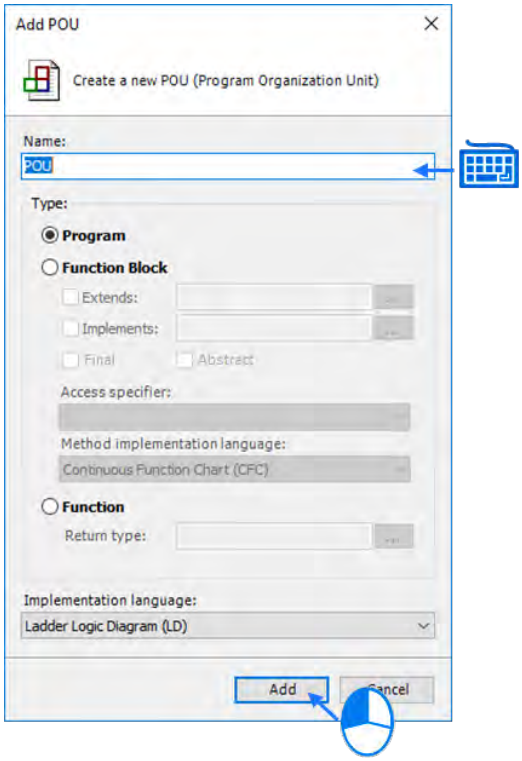
' #!'ÆK #ÞXO E 2 Pä) QÑX35—(…2'fç fE " Fk#¿a¶ Û#Í(ý' LâNÆ •/:.áJ²_[/ _[N«#õ QÑ"• ŽE Fß+à.{ Fk#¿a¶ •Oó!]#¿a¶!I+ #Ö#©OêIê7.5 Q@ Û

7.6.1.3 DIADesigner -AX 4n'\ POU

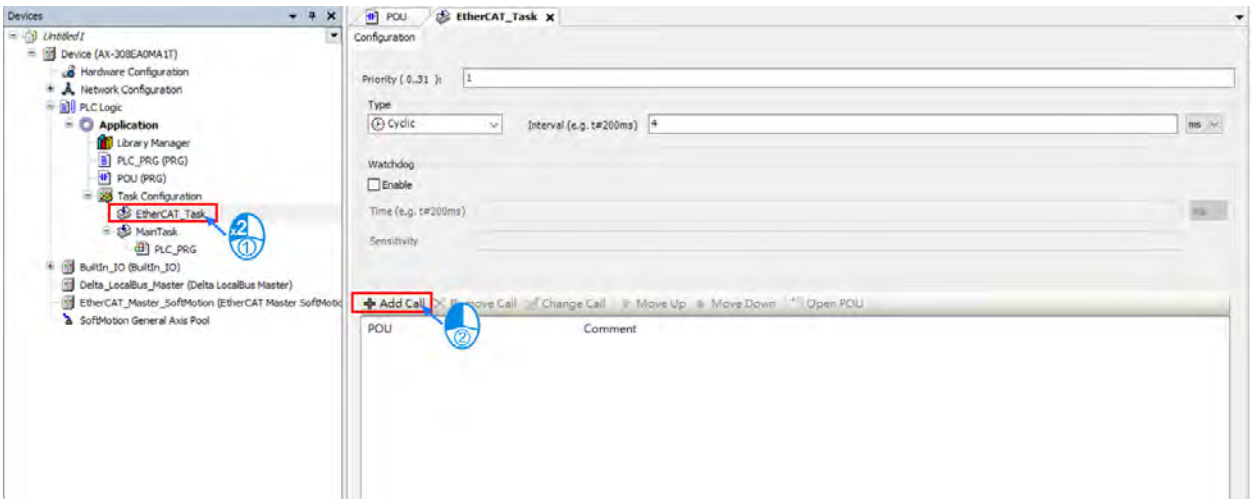
„ .ç$ DIADesigner-AX -Ù6ðFkh`FÕ •.]' Iò.v =â"‡Iò.v •' å Application æo 7î#Ú!â_ð#½ åAdd Object æ !t_ð#½ å POUæ



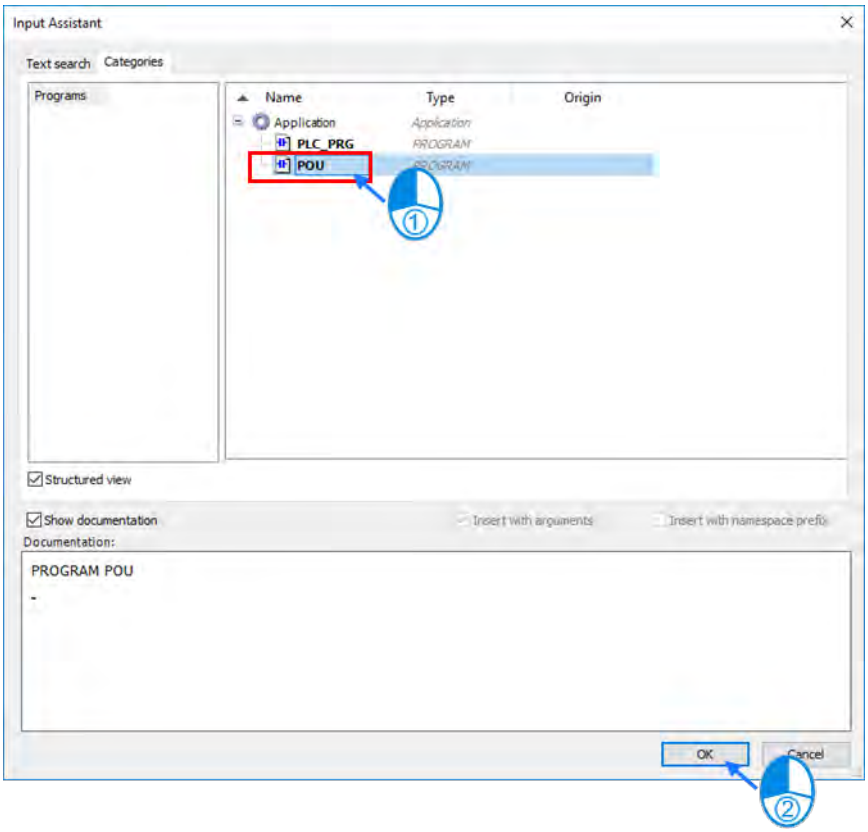
„ ' åName æ7ö _z!LIò.v#ôI× •.]' åImplementat ion language æ+>;œ _ð2ÐIò.v[ÔYç •_ð2Ð+s1÷#õ • [Þ2ð ò å Add æÛ



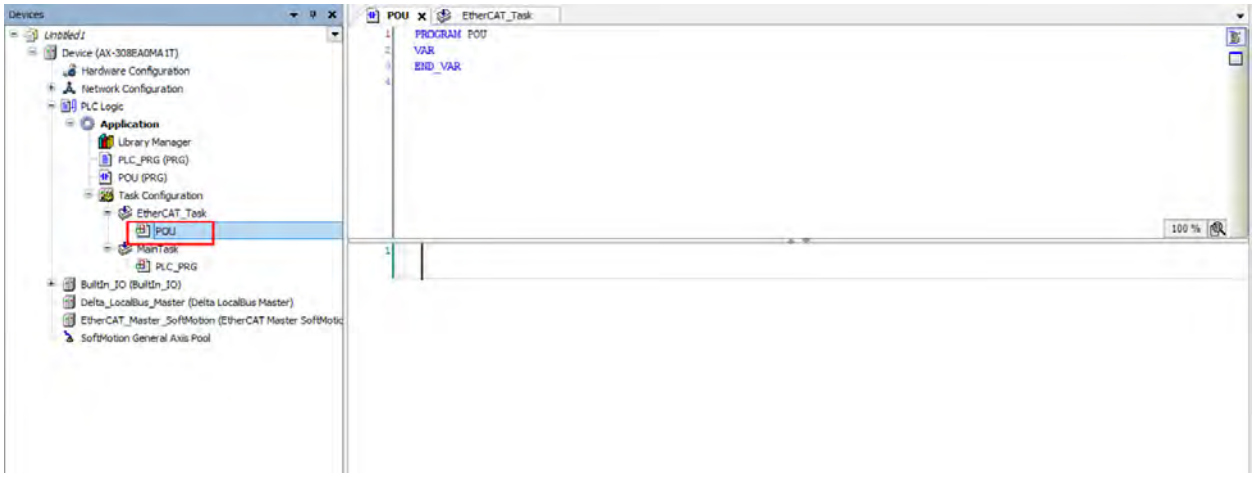
„ -Í5 !áC— POU •.]' å EtherCAT_Task æ@ #½-Íe ò •_ð#½ åAdd Call æÛ



„ _ð#½2'.áJ²Fk POU .]_ð2Ð åOK æ



„ _ð2Ð åEtherCAT_Task æ!lFk åPOU æ#Z#Ö.ç)²Ný!€Iò.v



7.6.1.4 PDO 4Þ*ÂoÑMapping oÒ

' fE _·"•3Ž" 2î Ë 2"4 ƒ¬hb+s1÷ DIADesigner-AX _V Ý õ AX _·"•3Ž" CPU 2eÛ PDO‹Process Data Objects Œ6 +ë ‹Mapping ŒFƙ[–[¥OU Û

PDO 6 [¥Fk[¥+• # •

RxPDO ‹1600 hex Œ	Control Word ‹6040 hex Œ TargetPosition ‹607A hex Œ
TxPDO ‹1A00 hex Œ	Status Word ‹6041 hex Œ ActualPosition ‹ 6064 hex Œ

ñXO ! ASDA-A2-E hk!/[¥+• f" E Fk PDO 6 +ë#©5W Û

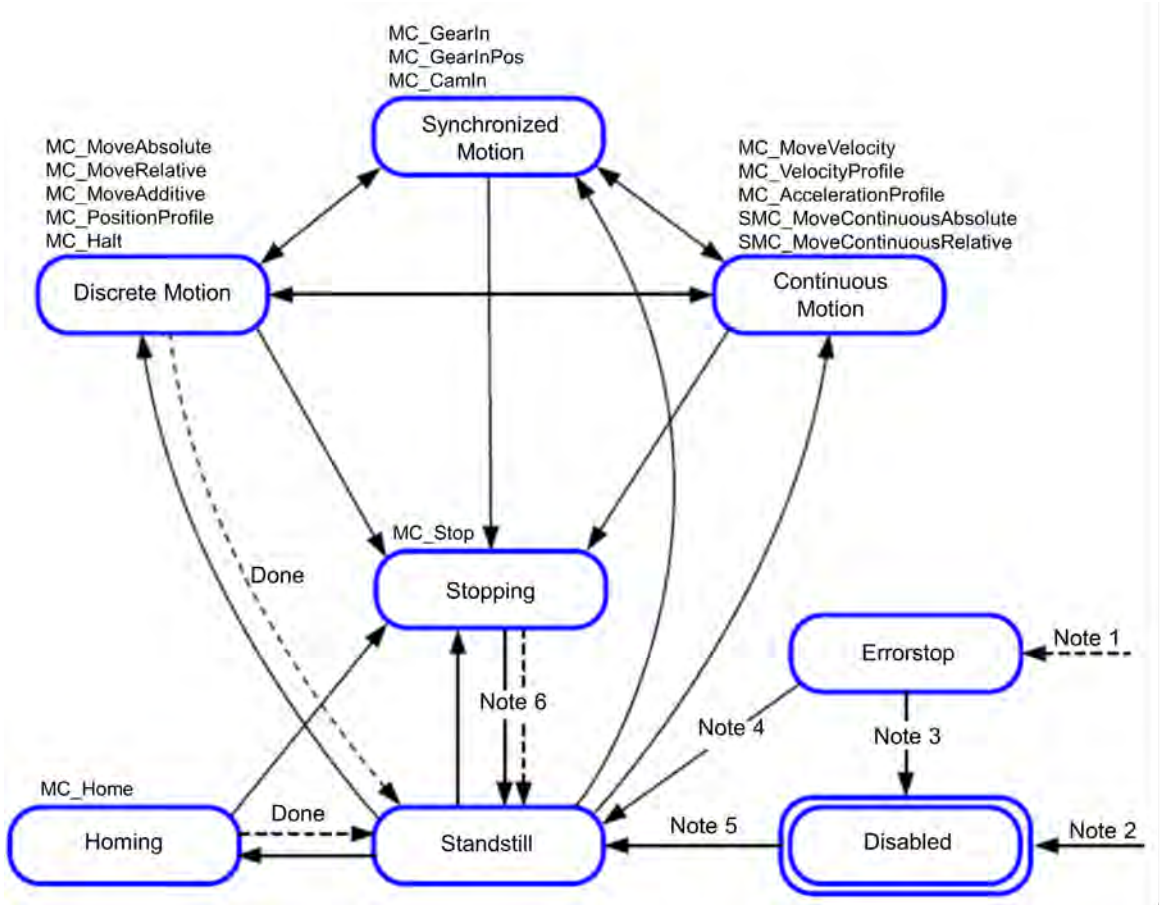
Fß+à.{_·"•"†Pä'>2'fç fE " Fk PDO #©5W •[Þ#©OÆX K¹ Õ^Ž!f2e ô1Å ¢1 J Û

7.6.2 ^2At.¿^*2

' [Û5õ)i < fE _·"•"†Pä'>Ný!€Iò.v"4 •fç!/ mYÊ_·"•3Ž" ' #ë _·"•"†Pä'> 2eÛFkB•/è7!_S3I5 .ö Û;K Ri ²N´/: fE " ô#óFk_·"•"†Pä'>5Ý •#<_[B•/è7!_S3I$s_[N«_·"•Fk) _[B•/è_S3I Û_S3IY«" K #ï PLCopen _·"•3Ž" 7î!- Û

7.6.2.1 ^2At.¿

z #ó;L_[



Note 1 •_[#ÑYh#¸E e [Ö, _Â!L“ErrorStop”

Note 2 •/: MC_Power Fk Enable #¿1÷False û<ˆ6ð#¸E _[e [Ö5Ý

Note 3 •2NX3 MC_Reset û MC_Power Fk Status ! False

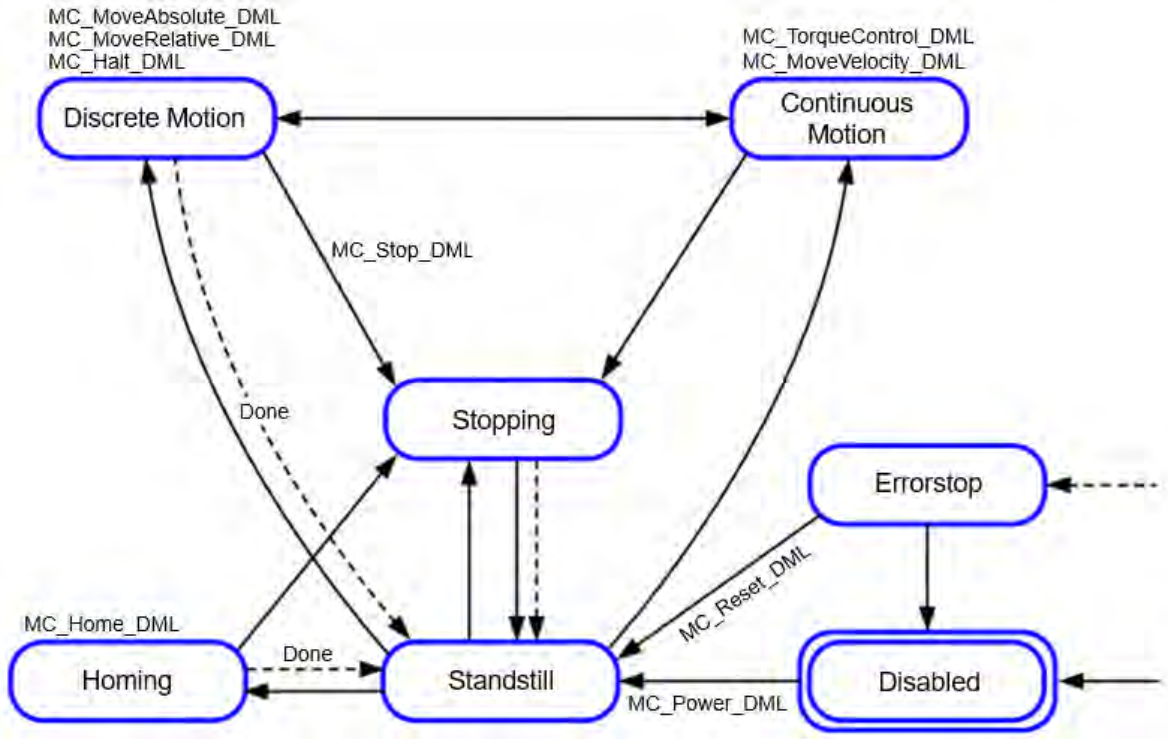
Note 4 •2NX3 MC_Reset û MC_Power Fk Status ! True û MC_Power Fk Enable ! True

Note 5 •MC_Power Fk Enable ! True • û MC_Power Fk Status ! True

Note 6 •/: MC_Stop Fk Done #¿1÷True • û MC_Stop Fk Execute ! False 5Ý

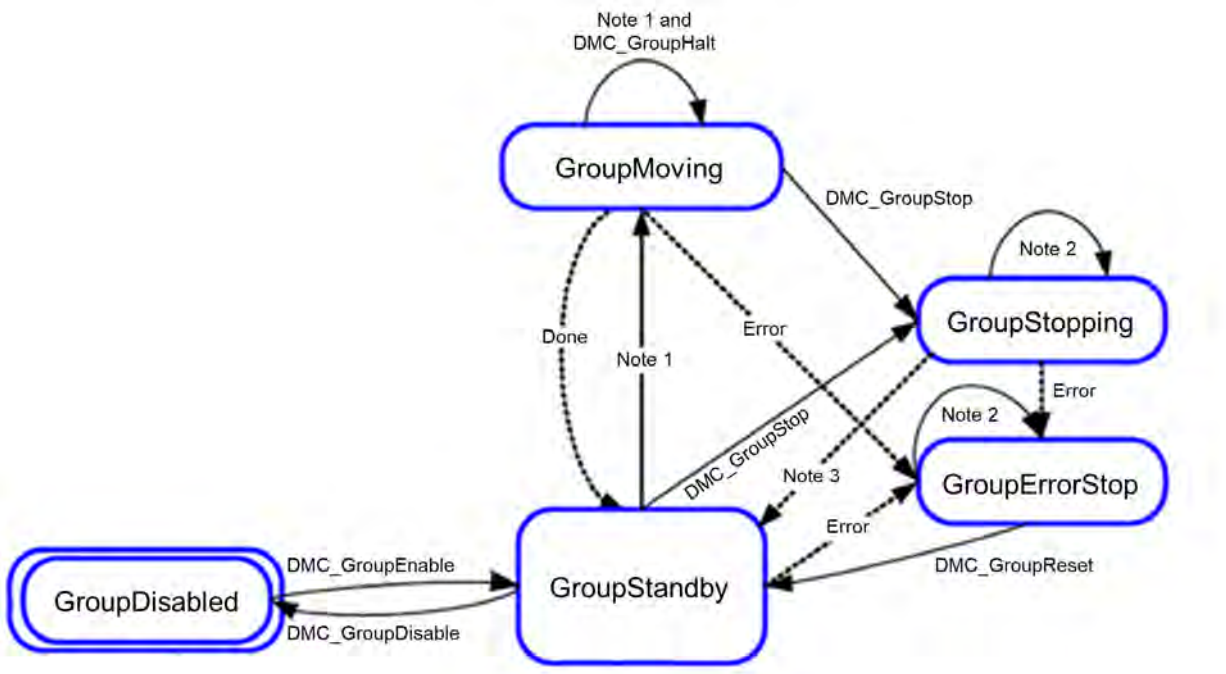
B•/è#ôI×	+• 0
Disabled	_[(ë u !6ô Servo OFF B•/è
Standstill	_[(ë u !6ô Servo On FkB•/è
Discrete Motion	2NX3#<_[_·"•2î Ë_[B•/è ! Discrete Motion
Continuous Motion	2NX3#<_[_ÅNÔ_·"•2î Ë •_[B•/è ! Continuous Motion Û
Synchronized Motion	2NX3#ó;L_·"•2î Ë •_[B•/è ! Synchronized Motion Û "ì$ K0/l#ó;L2î Ë5Ý
Stopping	2NX3MC_Stop 2î Ë C;l#õ •Active ! TRUE FkB•/è Û ' ;KB•/è ò5Ç<¼2NX3#<_[â <_·"•2î Ë Û
ErrorStop	/:#<_[#ÑYhe [Ö •_[B•/è ! ErrorStop Û ' ;KB•/è ò5Ç<¼2NX3#<_[â <_·"•2î Ë Û
Homing	2NX3#<_[&Å#†@ 2î Ë •_[B•/è ! Homing Û

z +• 4_[



B•/è#ôI×	+• 0
Disabled	_[(ë u !6ô Servo OFF B•/è
Standstill	_[(ë u !6ô Servo ON FkB•/è
Discrete Motion	2NX3#<_[_·"•2î Ë_[B•/è ! Discrete Motion
Continuous Motion	2NX3#<_[_ÅNÔ_·"•2î Ë •_[B•/è ! Continuous Motion Û
Stopping	2NX3MC_Stop_DML 2î Ë C;I#õ • Active ! TRUE FkB•/è Û ' ;KB•/è ò5Ç<¼2NX3#<_[â <_·"•2î Ë Û
ErrorStop	/:#<_[#ÑYhe [Ö •_[B•/è ! ErrorStop Û ' ;KB•/è ò5Ç<¼2NX3#<_[â <_·"•2î Ë Û
Homing	2NX3#<_[&Å#†@ 2î Ë •_[B•/è ! Homing Û

7.6.2.2 ^2M,At.¿



Note 1 •_éE 2'6ð_[N«Iâ"•"†Pä'> •gEKˆCí'r Û

Note 2 •_[N«B•/è ! GroupErrorStop 1ý GroupStopping 5Ý •#Ö Ì2NX32'6ð_[N«_·"•"†Pä'> •-6 _[N« ô 6ð â <"• C •fK m DMC_GroupResets $s GroupErrorStop Ì#±#¸E â <e [Ö •_[N«B•/è _S ! GroupStandby 1ý GroupErrorStop Û

Note 3 •/: DMC_GroupStop ! Done 1ý MC_GroupStop gEExecute Û

Note 4 •GroupDisabled #ÑPä' GroupStandby B•/è_S3I Û)i7ƒ_[N«B•/ègE GroupStandby ò2NX3 DMC_GroupDisable +í 2Œe Û

B•/è#ôI×	+• 0
GroupDisabled	2NX3MC_GroupDisable 2î Ë •!î3I_[B•/èQÚ GroupDisabled Û
GroupStandby	7 2NX3 â <_[_[N«_·"•2î Ë •_[N«B•/è ! GroupStandby Û

B•/è#ôI×	+• 0
GroupMoving	;J' 2NX3_[N«+• 42î Ë •_[N«B•/è ' GroupMoving Û
GroupStopping	/: MC_GroupStop Fk Active ! True ;K5Ý_[N«B•/è ' GroupStopping Û _[N«' ;KB•/è •5Ç<¼2NX3 â <_[N«_·"•2î Ë Û
GroupErrorStop	_[N«#ÑYh#¸E e [Ö5Ý •, _Â!L GroupErrorStop Û

„ #<_[B•/è!î3I_[N«B•/è

-)i7ƒN« Fk ç _[' ErrorStop •OóN« ô' GroupDisabled •" 5[N«' GroupErrorStop Û
- /: GroupMoving/GroupStopping/GroupHoming 5".ç ç _[FkE >w5Ý •Group (ë u GroupErrorStop B•/è Û
-)i7ƒ2'6ð_[`ä(ë u StandStill B•/è'• N«#Ö Ì(ë u GroupStandby •GroupDisabled 1ý GroupErrorStop B•/è Û
-)i7ƒ#<_[_·"• 5" mN«_·"• •" [ÌN« Fk!]+j #<_[+íJ²#Z C;I.]_Â!L C;IB•/è •N«B•/è_Â!L GroupStandby Û

„ _[N«B•/è!î3I#<_[B•/è

-)i7ƒN«(ë u GroupStandby B•/è •" #<_[B•/è ôfç!O`Ï(ë u StandStill B•/è Û
- N«Iâ"•$d Ë ‹"ì2Ó MC_GroupStop Œ•" [ÌN« Fk2'6ð#<_['.(ë u SynchronizedMotion B•/è Û
- /:_[N«_·"•7 eÛ#¸E e [Ö5Ý •_[N« 2'6ð_[+íJ²#Z C;I •FÛ" N«_Â!L GroupErrorStop Û;¶ gEe [Ö #<_[+í_Â!L Standstill B•/è Û
- _[N«B•/è ! GroupErrorStop •" ô/X$´#<_[FkB•/è Û

7.6.3 ^Ž!f2e ô1Å ¢EB1%W #JAt.¿

AX Lâ!þ3Ž" &Odo+à_·"•"†Pä'>!í1÷ Ì ò Ì 2) Lb" •

I´Lb	3¶_×
MC_	K #ïPLCopen 7î!-Fk_·"•3Ž" "†Pä'>2î Ë
DMC_	#×_¥QÑ+• 0"†Pä'>2î Ë*

Oó' ;¶ _·"•3Ž" "†Pä'>2î ËFk çR .üQ "ì2Ó_z!L ‹ Input Œ Ú_z!á ‹ Output Œ#±_z!l/_z!á ‹ In-Out Œ Û7 Ri[Û5õ_À , çR .üQ Fk+• 0$s çR X3 !

*;¦ •#×_¥QÑ+• 0"†Pä'>2î Ë ‹DMC Œ"ì2Ó#×_¥+• 0Fk_·"•3Ž" 'r"†Pä'>$s!]+j _éE u AX _·"•3Ž" CPU FkKˆ Cí/gEKˆCí'r"†Pä'> Û[ÍN-_·"•"†Pä'>!l+ •[Þ#©Oê AX K¹ Õ^Ž!f2e ô1Å ¢1 J Û

7.6.3.1 1%W 1Å ¢EB&¸5êX, ×

z _z!L$s_z!á.üQ Fk+• 0

_·"•3Ž" "†Pä'>Fk çR _z!L$s_z!á.üQ)i ò2'!þ Û` . "†Pä'>"ì$ QÚ+ø ç 1ý ç`Ï!í ò!þFk çR .üQ Û r)i •

„AN_·"•3Ž" "†Pä'>Fk ô#óB`0 • ç "†Pä'>'á7 ñ 6ð Execute ‹2NX3 Œ1ýEnable ‹ fPä Œ!] ç

_z!LQ Û

_z #			
#ôI×	"†Pä	5W3ULb'r	[¥+• # ‹n¿[‹ # Œ
En	3Œ5 7LQÑ2î Ë"4JÖFk`"_xB•/è	BOOL	True/False ‹False Œ
Enable	fPä_·"•3Ž" "†Pä'>	BOOL	True/False ‹False Œ
Execute	2NX3_·"•3Ž" "†Pä'>	BOOL	True/False ‹False Œ

^Q ¸			
#ôI×	"†Pä	5W3ULb'r	[¥+• # ‹n¿[‹ # Œ
Eno	_è En _z!LFk`"_xB•/è" ò 3Œ2î Ë	BOOL	True/False ‹False Œ
Done	XOI!"†Pä'>Fk2NX3-Ù+s1÷	BOOL	True/False ‹False Œ
Valid	XOI!_z!á.üQ 6%I!Fk # !6ð5/ #	BOOL	True/False ‹False Œ
Busy	XOI!_·"•"†Pä'>-Ù3y!L2NX3.v	BOOL	True/False ‹False Œ
Active	XOI!_[;JX'"†Pä'>2'3Ž"	BOOL	True/False ‹False Œ
CommandAborted	XOI!_·"•"†Pä'>Fk2NX3X’ 5”	BOOL	True/False ‹False Œ
Error	XOI!"†Pä'>#¸E e [ÖFkB•/è	BOOL	True/False ‹False Œ

_·"•3Ž" "†Pä'>` . 6ð Execute 1ý Enable _z!L.üQ ÛExecute/Enable E u fPä1ý$ "•_·"•3Ž" "†Pä'> Û _·"•3Ž" "†Pä'> çR 6ð Busy _z!á$s Done _z!á Û Busy _z!á$s Done _z!áXOI!_·"•3Ž" "†Pä'>FkB•/è Û)i7ƒ_· "•3Ž" "†Pä'>Fk2NX3#ÖX’#Í ç _·"•3Ž" "†Pä'>2' 5” •" ;K"†Pä'>_z!áQ "ì$ CommandAborted Û;K(ý • /:_·"•3Ž" "†Pä'>2NX35Ý#¸E e [Ö •_z!áQ Error +í _S ! True Û

_·"•3Ž" "†Pä'> ô ¬!^6ð Execute/Enable _z!L • F#ÖPä"ì$ _z!L #/ B•/èFk_z!L.üQ •!]B`0)i ò2'_× Û

- =Cæ^Q #4. ú
  - „ !^6ð Execute _z!LFk"†Pä'> #ë_z!L.üQ Fk5W # ' Execute _z!L È#Þ µ False " True Fk_S/è5ÝX’ #½E Û - Execute ' 2NX3 a´5—X’YÍ#¸ •.] ô [•_z!L5W #X’6Û5— Û
  - „ !^6ð Enable _z!LFk"†Pä'> #ë_z!L.üQ Fk5W # ' Enable _z!L È#Þ µ False " True Fk_S/è5ÝX’#½ E ÛFß_j u Execute _z!L • Enable _z!L.üQ Fk"†Pä'>` . 6ð_j) _z!L5W #fçYhX’2èNÔ6Û5— ‹[ÍY¨ #ë"†Pä'>[Û5õ Œ
- ^Q #4. ú\C ¸QÁ%²
  - „ _·"•3Ž" "†Pä'>YÍ#¸$ "•#õ •LâNÆ f7" E 2 _z!L]l!á!([ŸRê&ÛFk_z!L5W # •1ýOì' _·"•3Ž" "†Pä '>2NX35ÝLâNÆ 6%I!"†Pä'>e [Ö#¸E •_ÂOó[•_·"•_[!áC—e [Ö ÛE 2 .{`f!4' .{E Iò.v _z!L ô;J HUFk_z!L5W # Û
- ^Q ¸-ÓOØEB P4cA7.å
  - „ !^6ð Execute _z!LFk"†Pä'> • Busy _z!á ÚDone _z!á CommandAborted _z!á1ý Error _z!á •#ó5ÝeÛ # Ñ 6ð!] ç B•/è X’[¥OU ! True Û/: Execute _z!L[¥OU !True k Busy k Done k CommandAborted 1ý Error _z!á!] ç /¬hb[¥OU ! True Û
  - „ !^6ð Enable _z!LFk"†Pä'> • Valid _z!á$s Error _z!á6 y5ŒFk •0ö#Z#Ñ6ð!] ç #Ö Ì[¥OU ! True Û
- ^Q ¸EB4.2,/At.¿ ú5Ç4 4´d²?w

„ !^6ð Execute _z!LFk"†Pä'> •/: Execute _z!L È#ÞE True " False _S/è •FÕ"4 True Fk Done _z!á • Error _z!á • CommandAborted _z!á$s_z!áQ 4Fk5W3U X'(ô 41ý=ìfÝ Û -/:"†Pä'>2NX3 ‹ Busy Œ 5Ý •#Z f Execute _z!L È#ÞE True " False _S/è •"†Pä'>Fk2NX3 F ô C;I Ûhk[^ !áC—Fk Done _z!á • Error _z!á •CommandAborted _z!áK0_z!áB•/è´A ŽE True .] ÄE@ ç $O7 Û

„ !^6ð Enable _z!LFk"†Pä'> •/: Enable _z!L È#ÞE True #ø False _S/è k Valid _z!á kBusy _z!á$s Error _z!á (ô 4 Û

- Done ^Q ¸A7.å

  _·"•3Ž" "†Pä'>1÷"†2NX3+s;¼#õ •_·"•3Ž" "†Pä'>Fk Done _z!á+íX'[¥OU ! True Û

- Busy ^Q ¸A7.å

  „ !^6ð Execute _z!LFk"†Pä'> fE Busy _z!á ÌXOI![Ì"†Pä'>Fk2NX3, 7 +s1÷ • û5—_z!áB•/è‹ # Œ+í ' Iô#õ ŽE Û/: Execute _z!L È#Þ µ False " True _S/è •Busy _z!á[¥OU ! True Û/: Done _z!á • CommandAborted _z!á1ý Error _z!áX'[¥OU ! True •" Busy _z!á(ô 4 Û

  „ !^6ð Enable _z!LFk"†Pä'> fE Busy _z!á Ì6%I![Ì"†Pä'>Fk2NX3, 7 +s1÷ • û5—_z!áB•/è‹ # Œ+í ' Iô#õ ŽE Û/: Enable _z!L È#Þ µ False " True _S/è • Busy _z!á[¥OU ! True •#ÑYh busy ! True _z!LB•/è‹5W # Œ´#Öhk7 #¿"ý Û

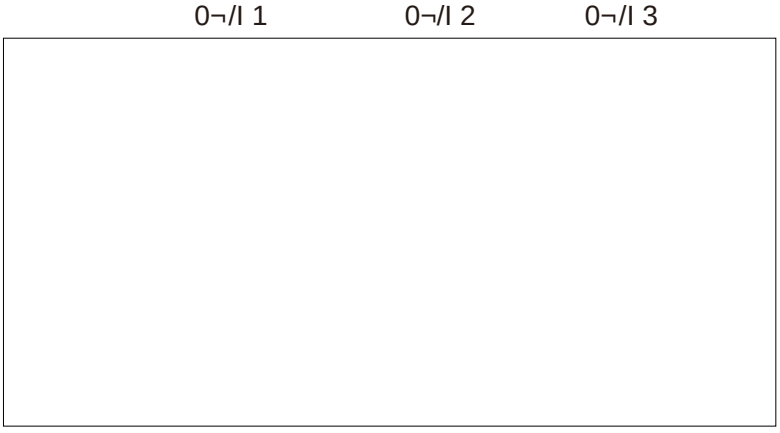
- CommandAborted ^Q ¸A7.å

  /:_·"•3Ž" "†Pä'>Fk2NX3X' 5"5Ý • CommandAborted _z!áX'[¥OU ! True Û

- Enable ^Q # Ì Valid ^Q ¸EB 1K¹

  !^6ð Enable _z!LFk"†Pä'> fE Valid _z!áXOI!FÕ"4_z!á5W3UB•/è6 $ 6ð5/ Û#Ñ6ð/: Enable _z!L[¥ OU ! True û_z!á5W3UB•/è6 6ð5/5Ý • Valid _z!á24 [¥OU ! True)i7ƒ"†Pä'>!áC—e [Ö • z!á5W3U/B•/è+í6 5Ç5/Fk • û Valid _z!á+íX'[¥OU ! False Û_·"•3Ž" "†Pä'>!áC—Fke [ÖX'=ofK#õ • û_z!á5W3U/B•/è#¿ !6ð5/5Ý •Valid _z !á24 X'[¥OU ! True Û

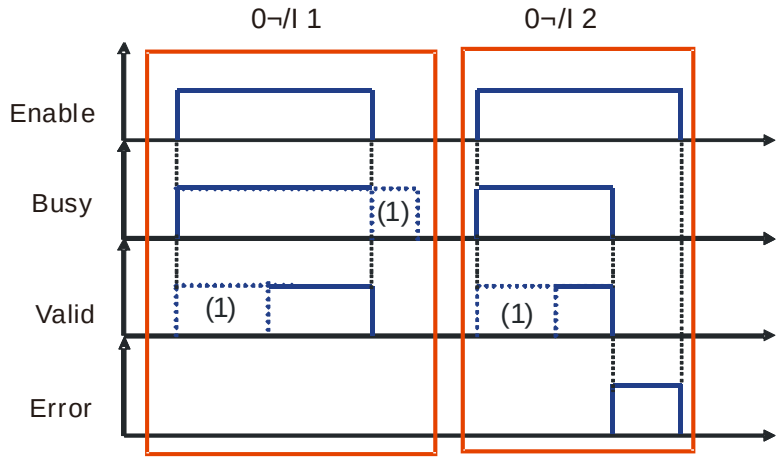
7.6.3.2 ^Q #/ ^Q ¸-ÓOØ4´-M%¼



0¬/I 1 •_·"•3Ž" "†Pä'>Fk2NX3 5" Û

0¬/I 2 •_·"•3Ž" "†Pä'>#¸E e [Ö Û

0¬/I 3 •_·"•3Ž" "†Pä'>;J. 2NX3+s;¼ Û



(1) #ÖPäfçYh ç ,5ÝeÛ

0¬/I 1 •_·"•3Ž" "†Pä'>;J. 2NX3 Û

0¬/I 2 •' _·"•3Ž" "†Pä'>5Ý#¸E e [Ö Û

7.6.3.3 " ¾^Ž!f1Å ¢`‹'Ë1%W W ø

#<_[_·"•"†Pä'>' "†Pä'>2NX37 eÛ‹ Busy B•/è Œ#Ö Õ5 _z!L.üQ #¿a¶#õ!t; +à"†Pä'>2NX3.üQ A ñ#.<¦YÍ #¸ Û;K5Ý"†Pä'>_z!á.üQ B•/è ô#¿ ‹NÛ2è Busy B•/è Œ • -LâNÆ2NX3Fk"• CK0 u ÌNú!™: .öFkAborting 2:5""4 ç; Fk ñ#.<¦YÍ#¸$d Ë ÛFß!ZX3 !: .ö[Þ#©Oê7 1 JIê 7.6.3.5 Q@[Û5õ Û

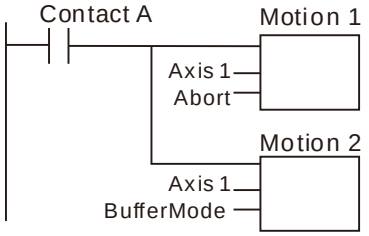
7.6.3.4 'Ø è^Ž!f1Å ¢"Ê4´"í!f

) _·"•3Ž" 2î Ë#ó5Ý$ "•2îFk6 #ó ç _[1ý_[N«' #ó çIò.v2R3¶$O7 !l6ð) _·"•3Ž" 2î ËX'YÍ#¸$ "• Û

„ ògIIò.v •/:3Œ@ A ! ON 5Ý •+à.{_[1 Fk_·"• 1 $s_·"• 2 ' #ó ç 2R3¶$O7 $ "• Û

„ ' 8–/I&å`"_x •2î ËX'2NX36 „3UE ñQÚ òFkha.v •2' Ì_·"• 1 !/X'$ "•Oó_·"• 2 ' _·"• 1 +s1÷ 2 #õ$ "• Û

„ _À 0¬!œ#ZX'Y- !) _·"•3Ž" 2î ËFk#ó5Ý$ "• Û_ÀI´) a´$ "•Fk: .ö6 E _z!L#¿a¶ BufferMode 7L+• 0 _·"•eÛFkNº#ï5 .ö •' ;KIò.v E _·"• 2 Fk BufferMode [¥+•7L!š+•_·"• 1 $s_·"• 2 2eÛNº#ïFk: .ö Û



7.6.3.5 ^Ž!f1Å ¢"Ê4´1%W W ø

z MÑ p8ß-Í

+à u#ó ç_[•/:6ð_·"•2î Ë3Ž" _[' _·"•_®Iò •#Ö Ì$ "•!]+j_·"•2î Ë •"4#õ _·"•2î Ë_ÂX3 ‹3Œ5Ý • 6ð6 l´: .ö#Ö ,_ð2ÐFk ‹3Œ: .ö • ‹3Œ: .ö#Ö Ì8 3U#õ ç _·"•2î ËFk BufferMode Q 4#©5W[¥+•7L_ð2Ð Û BufferMode ‹ ‹3Œ: .ö ŒFß!Z7 [ÔFk$ 0)i ò •

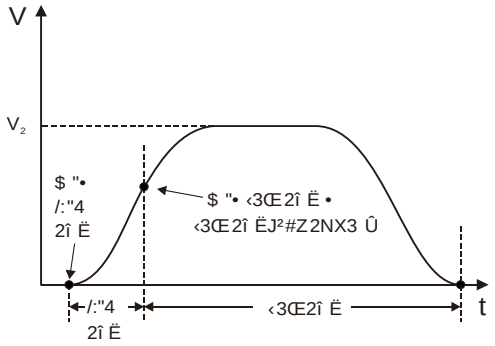
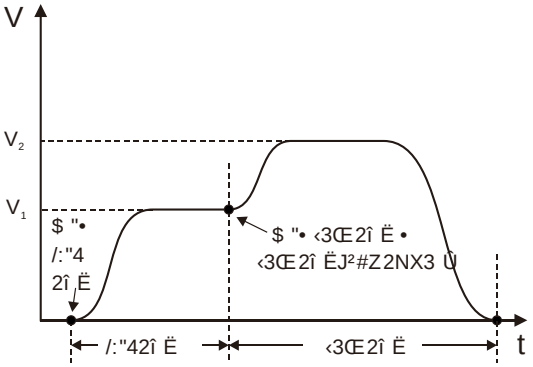
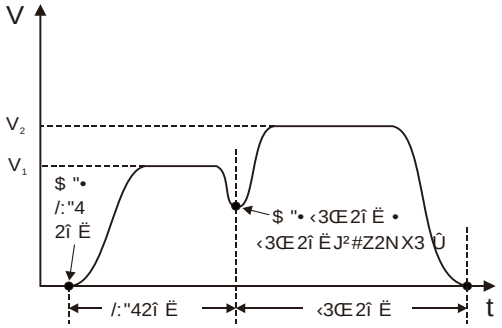
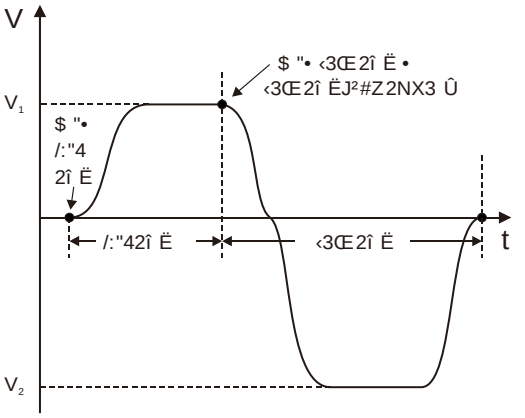
1. /:"42î Ë •/:"43Ž" _[Fk_·"•2î Ë
2. ‹3Œ2î Ë •K0/l2NX3Fk2î Ë
3. ‹3Œ` .• •/:"42î Ë!î3l" ‹3Œ2î Ë5ÝFk` .•
4. FÕ7î` .• •2î Ë Fk VelocityQ 4#©5W
5. FÕ7î 4OU • 4IâFß!Z2î Ë Position1ýDistanceQ 4#©5W

b2c8ß-Í	!f Z²4Ì
0 •mcAborting ‹2:5” Œ	J²#Z2:5”/:"42î ËFk"• C.]2NX3 ‹3Œ2î ËFk"• C
1 •mcBuffered ‹K0/l Œ	K0/l/:"42î ËFk"• C;J. 2NX3Nº7F#õ •.]J²#Z2NX3 ‹3Œ2î ËFk"• C
2 •mcBlendingLow ‹ Ì 5` ‹3Œ Œ	K0/l/:"42î ËFkFÕ7î 4OU" _¥#õ •.]J²#Z2NX3 ‹3Œ2î ËFk"• C ž‹3Œ` .• !/:"42î Ë õ ‹3Œ2î Ë _j 5FkFÕ7î` .• Û
3 •mcBlendingPrevious ‹ Ì"4 ç2î ËFk` .• ‹3Œ Œ	K0/l/:"42î ËFkFÕ7î 4OU" _¥#õ •.]J²#Z2NX3 ‹3Œ2î ËFk"• C ž‹3Œ` .• !/:"42î ËFkFÕ7î` .• Û
4 •mcBlendingNext ‹ Ì#õ ç2î ËFk` .• ‹3Œ Œ	K0/l/:"42î ËFkFÕ7î 4OU" _¥#õ •.]J²#Z2NX3 ‹3Œ2î ËFk"• C ž‹3Œ` .• ! ‹3Œ2î ËFkFÕ7î` .• Û
5 •mcBlendingHigh ‹ Ìj¿` ‹3Œ Œ	K0/l/:"42î ËFkFÕ7î 4OU" _¥#õ •.]J²#Z2NX3 ‹3Œ2î ËFk"• C ž‹3Œ` .• !/:"42î Ë õ ‹3Œ2î Ë _jj¿FkFÕ7î` .• Û

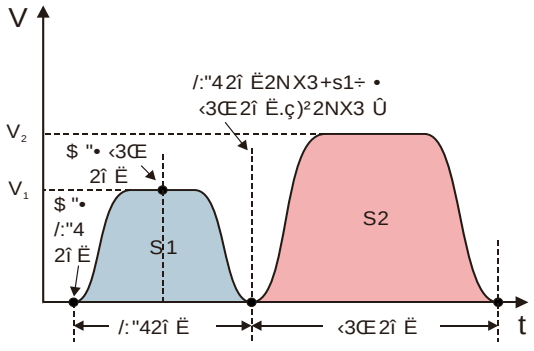
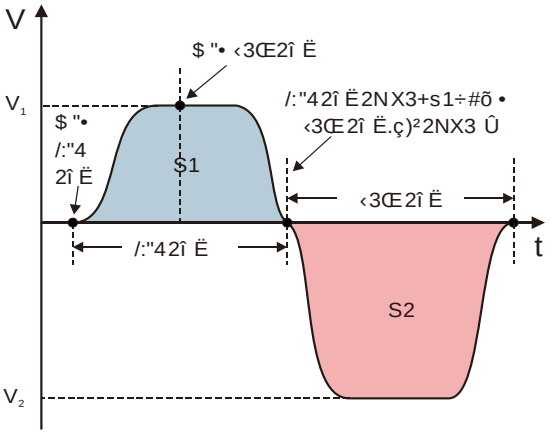
z QÁ IoãCæ â èE¶*· H¹1Å ¢6#J>" Z²4Ì

K ç Fß+à 4Iâ2î Ë` .•6ç) 6 $V_1$ • 4Iâa¶ ! $S_1$ •K s Fß+à 4Iâ2î Ë` .•6ç) 6 V_2 • 4Iâa¶6 S_2 Û5 #¿K s 4Iâ2î ËFk BufferMode f/~_À 2î Ë6ð ô#óFk ‹3Œ_®Iò •)i ò[Û5õ •

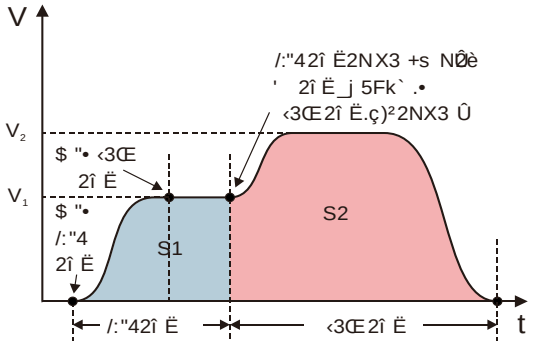
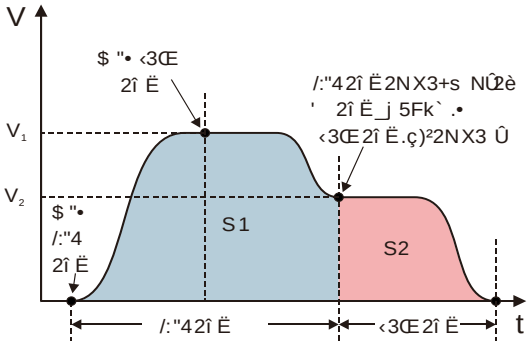
„ 1 4k Buffermode=mcAbortingoÕ ü IZ²4Ì%™H‹/ƒ soÕ Ä é(@ Éoã

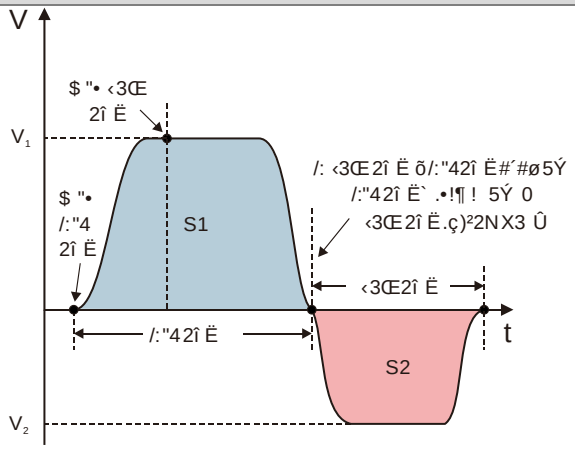
1. . ! 1Å ¢!^^Ý4´1 4k	2. . ! 1Å ¢!¾^Ýdô:s1 4k
	
3. . ! 1Å ¢ •^Ýdô:s1 4k	**4. b2c1Å ¢ Ì. ! 1Å ¢4w"ÏE¶"‹**
	

„ J .C Buffermode=mcBufferedoÕ ü IZ²4Ì JH‹/ƒ soÕ Ä é(@ Éoã

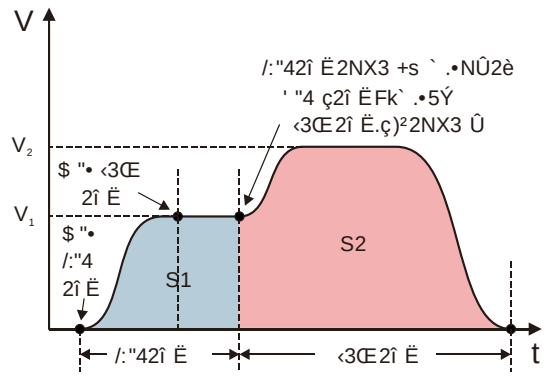
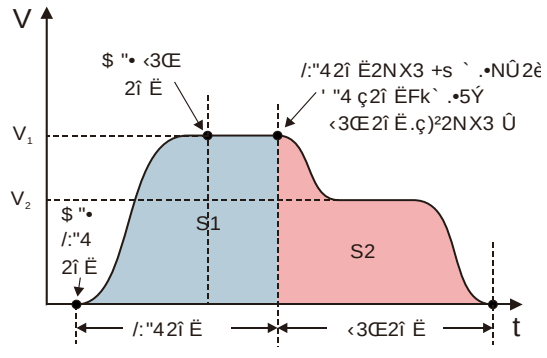
1. b2c1Å ¢ Ì. ! 1Å ¢4w"ÏE¶"Ê	2. b2c1Å ¢ Ì. ! 1Å ¢4w"ÏE¶"‹
	

„ ^Ý b2c Buffermode=mcBlendingLow oÕ ü IZ²4Ì ÇH‹/ƒ soÕ Ä é(@ Éoã

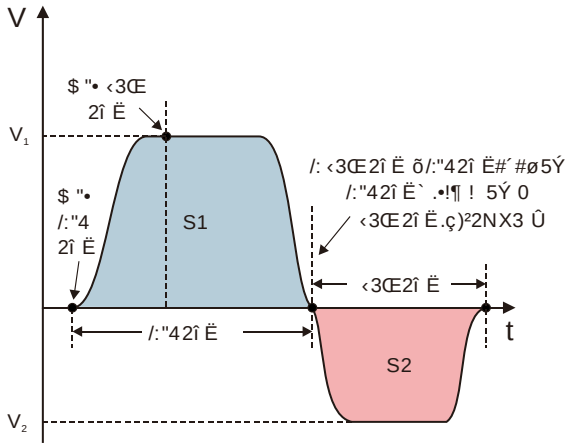
1. . ! 1Å ¢:' b2c1Å ¢^Ý-d*Í	2. . ! 1Å ¢:' b2c1Å ¢^Ý-d'å
	

3. . ! 1Å ¢#J b2c1Å ¢^Ý-d4w"ÏE¶"‹


„ £! ¾1Å ¢^Ý-d b2c Buffermode=mcBlendingPrevious oÕ ü IZ²4Ì ÇH‹/ƒ soÕ Ä é(@ Éoã

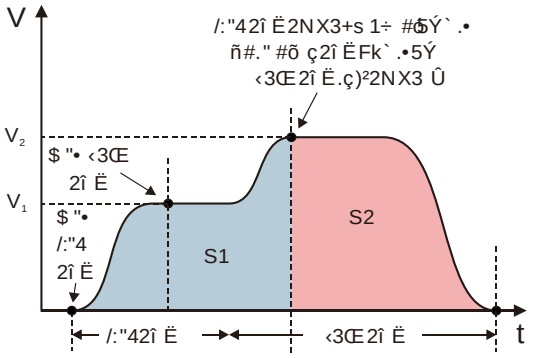
1. . ! 1Å ¢:' b2c1Å ¢^Ý-d*Í	2. . ! 1Å ¢:' b2c1Å ¢^Ý-d'å
	

3. . ! 1Å ¢#J b2c1Å ¢^Ý-d4w"ÏE¶"‹

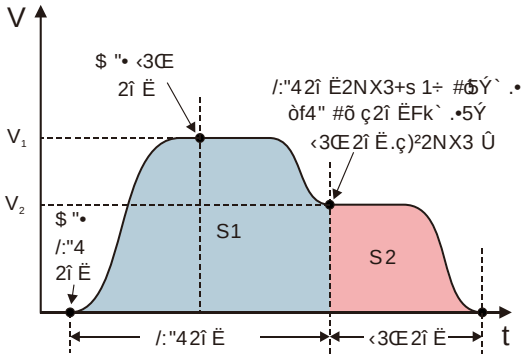


„ £"Ì ¾1Å ¢^Ý-d b2c Buffermode=mcBlendingNextoÕ ü IZ²4Ì ÇH‹/ƒ soÕ Ä é(@ Éoã

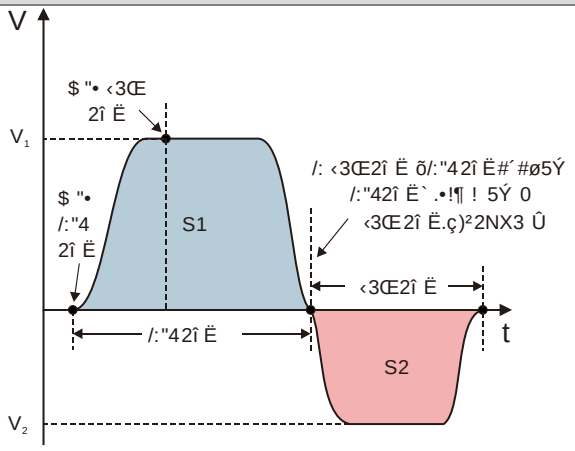
1. . ! 1Å ¢:' b2c1Å ¢^Ý-d*Í



2. . ! 1Å ¢:' b2c1Å ¢^Ý-d'å



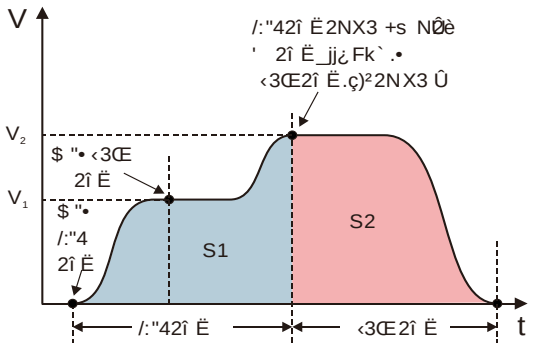
3. . ! 1Å ¢#J b2c1Å ¢^Ý-d4w"ÏE¶"‹



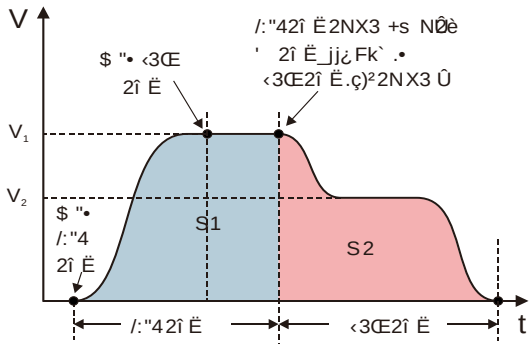
7

„ £i–^Ý b2c Buffermode=mcBlendingHighoÕ ü IZ²4Ì ÇH‹/ƒ soÕ Ä é(@ Éoã

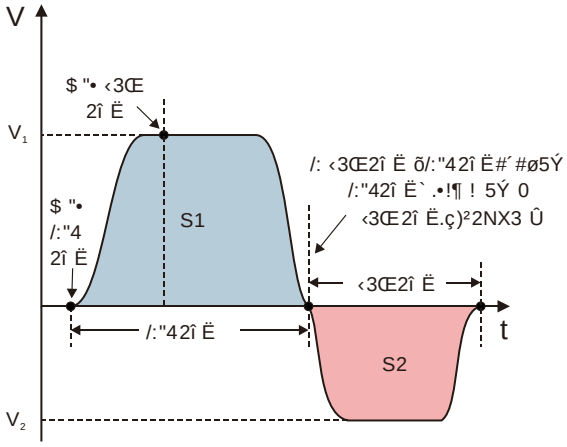
1. . ! 1Å ¢:’ b2c1Å ¢^Ý-d*Í



2. . ! 1Å ¢:’ b2c1Å ¢^Ý-d'å



3. . ! 1Å ¢#J b2c1Å ¢^Ý-d4w"ÏE¶"‹



*<Ï •#<_[_·"•2î Ë MC #Ñ5 2èAborting Fk5 .ö3ŒNÔ Û_[N«_·"•2î Ë5 2è ñgI2'6ð: .ö Û

7.6.4 N,

7 Ri[Û5õ_·"•3Ž" Iò.v 2 4OU+• 4=(Iò Û

7.6.4.1 N,EBH‹K9

MC "†Pä'>E I´ 4OUN«1÷ Û

- $d Ë 4OU •_·"•"†Pä'>NÀ+•$d Ë 4OU Û
- +…f, 4OU • µ !6ôjX"•&O+…f, Fk+…f, 4OŮÛ

$d Ë 4OU õ+…f, 4OUFk!ZLâ)i ò&å2'I! •

2î Ë 4OU õ+…f, 4OUFk Ì òh`FÕFß#ó Û

4OUl´Lb	+• 0[Û5õ
$d Ë 4OU	$d Ë 4OU6 _·"•3Ž" &O_z!áQÚjX"•&OFk 4OU #
+…f, 4OU	#´io 4OU6 ! !6ôjX"•&O1ýNýGè&O+…fĮFk 4OU #

*<Ï •VA_[5Ý $d Ë 4OUK0 u+…f, 4OU

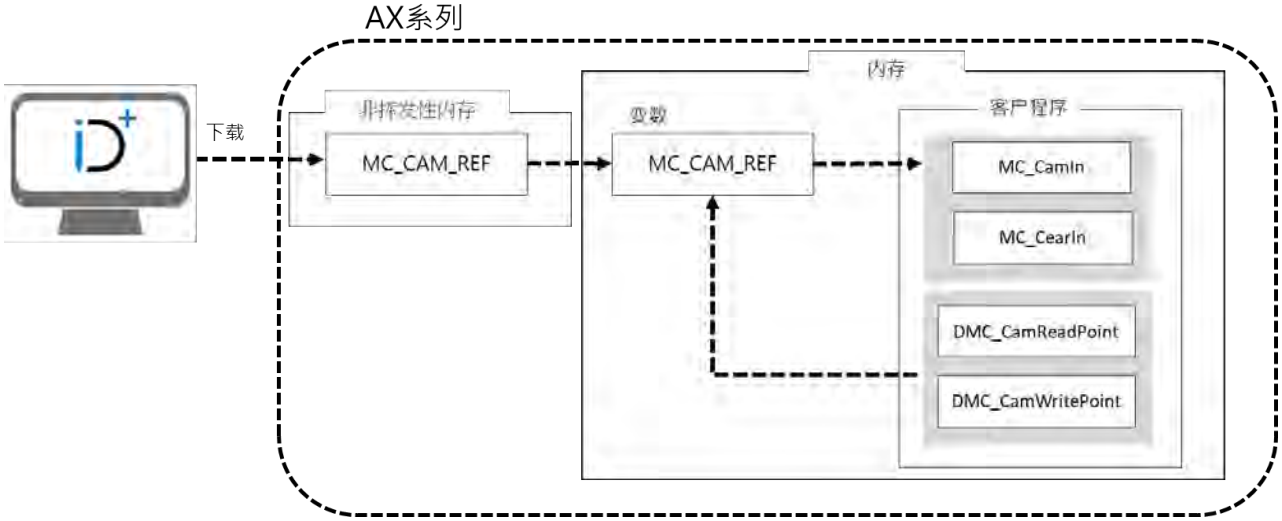
7.6.5 ¶^,W&#J ¶^,6t6B

;KRi ²N´E +7!ß_U4´ C#± fE DIADesigner-AX _V Ý ŽE CAM XO5W3U4´ C[¥+• • Ì#±E +7!ß_UFß!Z"†Pä'>2î Ë •[ÍN-2î Ë[Û5õ[Þ#©Oê AX K¹ Õ^Ž!f2e ô1Å ¢1 J Û

7.6.5.1 Có* ¶^,6t6B

fE DIADesigner-AX _V ÝFk!ß_UNý_x"†PäY«!ù!ß_U6ÙÑ¦_Û®` [– ò_dQÚ PLC .] fE MC "†Pä'>3Ž" !ß_U Û

- !ß_UXO" .á õ7•7k



7.6.5.2 Có* ¶^,-¸I‰

+• 0 "_[/ µ_[‹!ß_U_[Œ 2eÛ 4OU!ZLâFk5W3U •I× 2 !E +7!ß_U5W3U Û

RÌYh fE DIADesigner-AX Fk CAM Ný_x&ON¿" •fçYh!/GÌ`: " µ_[ 4OUFk!ZLâ • " µ_[ 4OUFk!ZLâ#Ö` _® Ì ò I´5 .ö_ÂX3.áJ² •

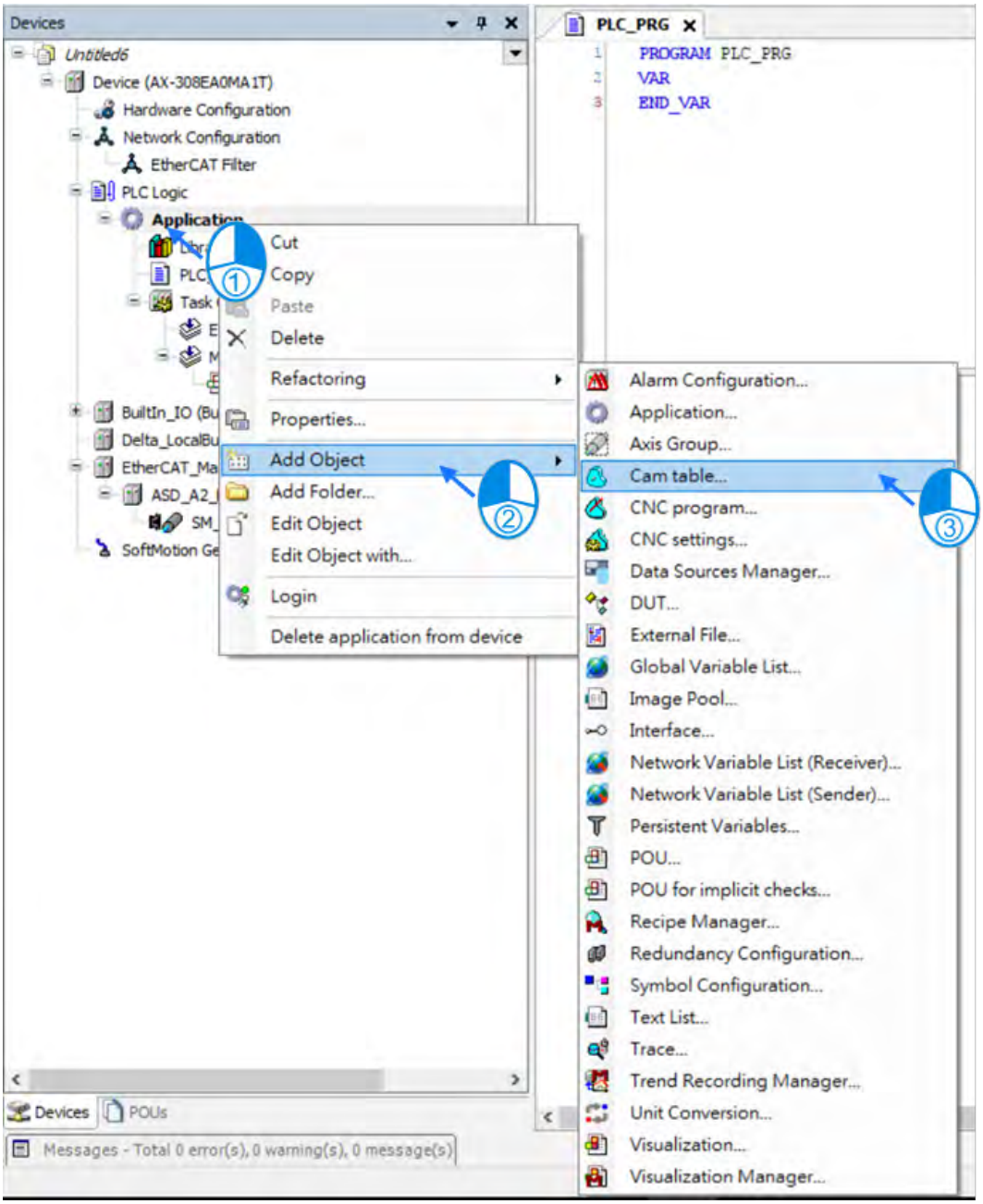
5 <¼ 1•8 3U[¥+•FkE +7!ß_U5W3U/~" " µ_[4OUFk!ZLâ Û

5 <¼ 2• µ+…f,-Ì C =2a¶ " µ_[2eÛFk+à.{!ZLâ Û

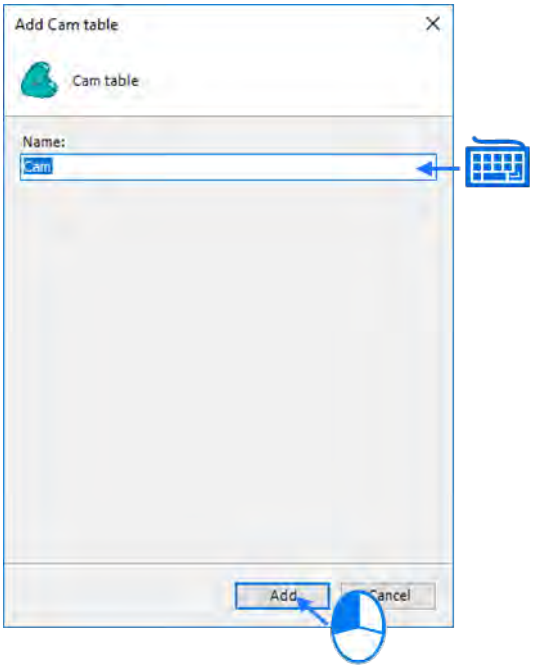
CAM Fk " µ_[!ZLâHU+•#õ •8 3U "_[Fk 4OU, Pä/~" µ_[Fk 4OU Û

z DIADesigner-AX CAM XO.áJ²

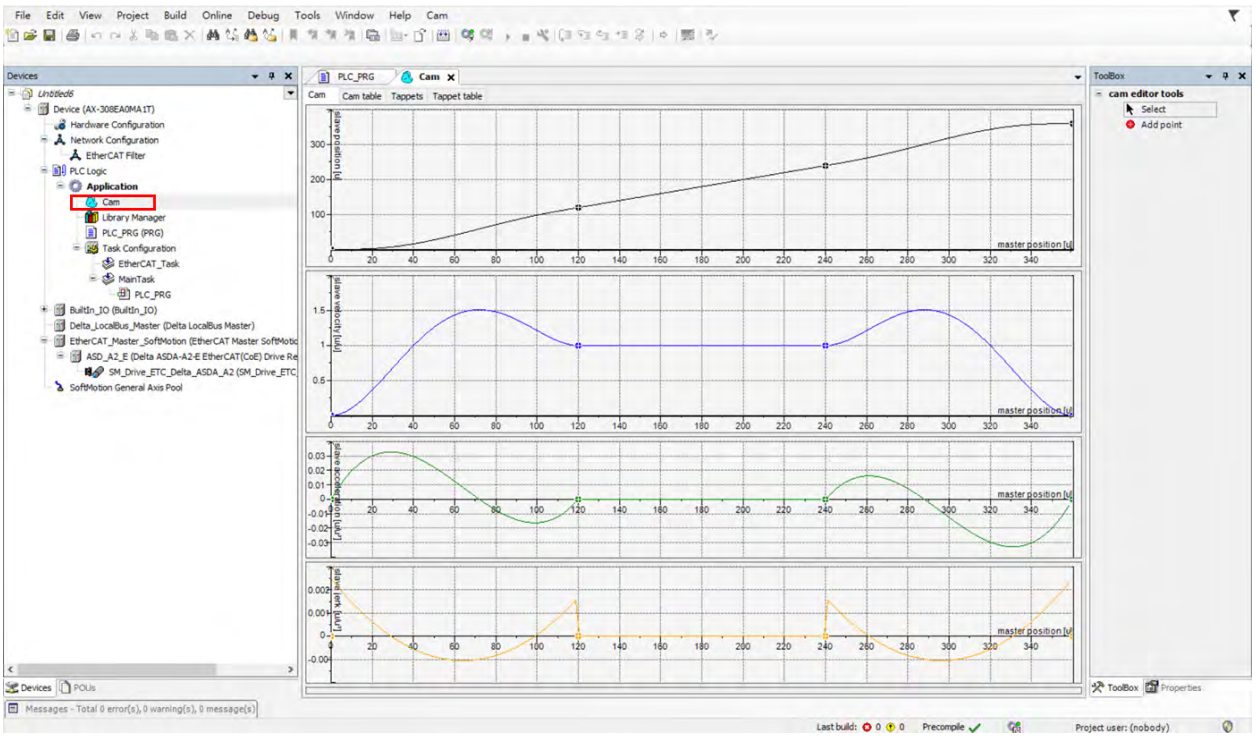
„ -Í5 #<!â åApplication æ@ #Úe •_ð2Ð åAdd Object æ#õ •!t_ð2Ð åCam Table æê



„ ' åCAM Table æ åName æ ! CAM XO#ôI× •#ÖQÑX3 Õ5 _z!L Û

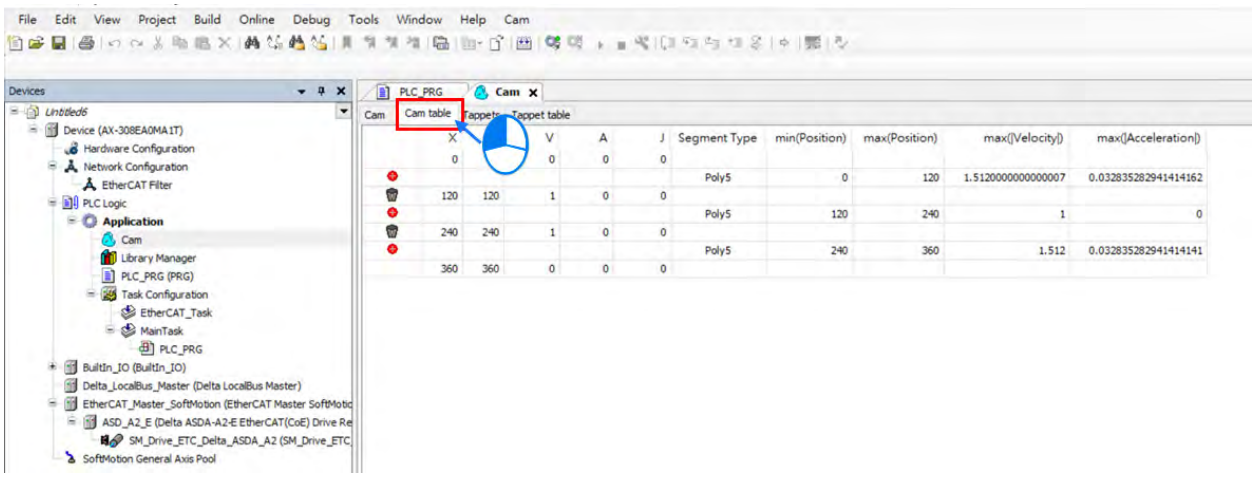


„ #<!â+s åAdd æ#Z#Ö' -Í5 Fò" Cam .áJ²



7

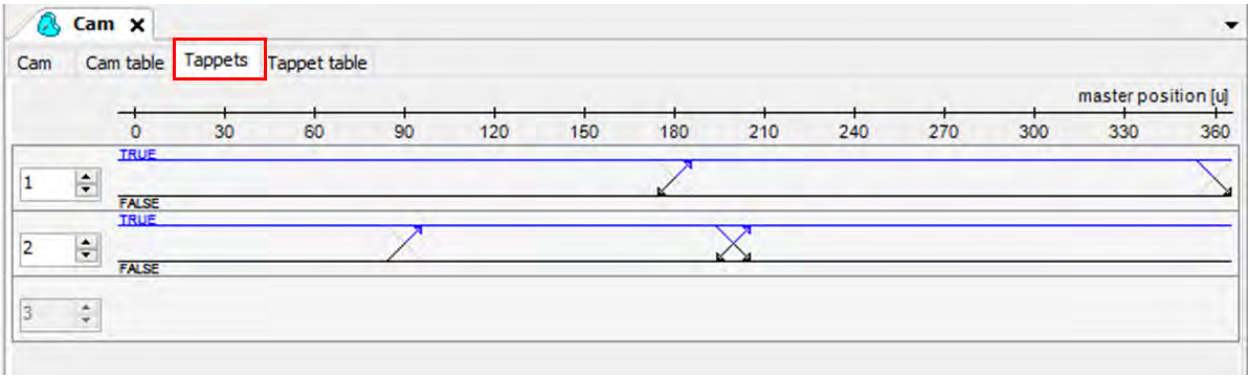
„ ' åCAM æFkE"gI #<!â å Cam Table æ



„ åCam Table æE"gI#Ö Õ5 Cam Fk5—(…1ý" fK@ 4 Û

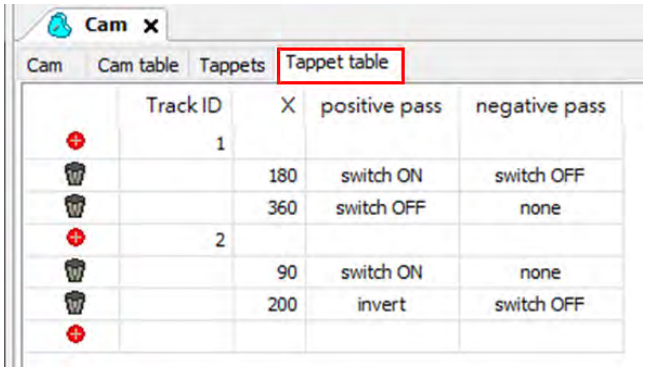
- #<!â #Ö5—(…@ 4
- #<!â #Ö" fK@ 4
- X • "_[@ 4
- Y • µ_[@ 4
- V • µ_[` .•
- A • µ_["‡` .•
- J • µ_["‡` .•Fk#¿"ýCn ‹]ª.• Œ
- Segment Type •6ÙN¦Lb'r

„ åTappets æE"gI#Ö[¥+•) 3!7- •¶ 3!7-#Ö[¥OU5W 3!7-@ ¶[¥+•+såTappet table æ#Ö' tappets Y©Fò3!7-@ õ "_[Fk!ZLâ&å •2°"• åTappets æXO ñFk3!7-@ •#ÖFÛ3Œ5 "• åTappet table æ ñFk [¥+•#©5W Û



„ åTappet table æE"gI#Ö[¥OU3!7- õ3!7-@ •.]4 a4 SMC_GetTappetValue 7L[â#½3!7-FkB•/è Û/:!ß _U "_[` _®3!7-@ 5Ý •" 5” "_[ !;J#ø1ý#´#ø` _® •.]+à.{ åTappet table æ Fk[¥+•7L5 #¿3!7-Fk B•/è Û

- #<!â #Ö5—(T.rack ID
- #<!â #Ö" fK Track ID
- Track ID •3!]]@ ID
- X •3!7-@ 4OU
- Positive pass •;J_S`." 3!7-@ "• C •"• C[¥+•)i ò •
  - ‹ None •5Ç"• C
  - ‹ Switch to ON • TRUE
  - ‹ Switch to OFF •FALSE
  - ‹ Invert •#´#ø
- Negative pass •#´_S`." 3!7-@ "• C •"• C[¥+•)i ò •
  - ‹ None •5Ç"• C
  - ‹ Switch to ON • TRUE
  - ‹ Switch to OFF •FALSE
  - ‹ Invert •#´#ø



7.7 ^Ž!f2e ô!]O»

7.7.1 K¹M•6t6B

_·"•"†Pä'>Fk#<_[_·"•2î Ë •#Ö' ` .•3Ž" Ú4OU3Ž" Ú2TGÐ3Ž" K0 ðI´3Ž" : .ö 2 ò •„E 2 [¥+•#©5W • Y«!ù_[Fk_·"•_O_à Û

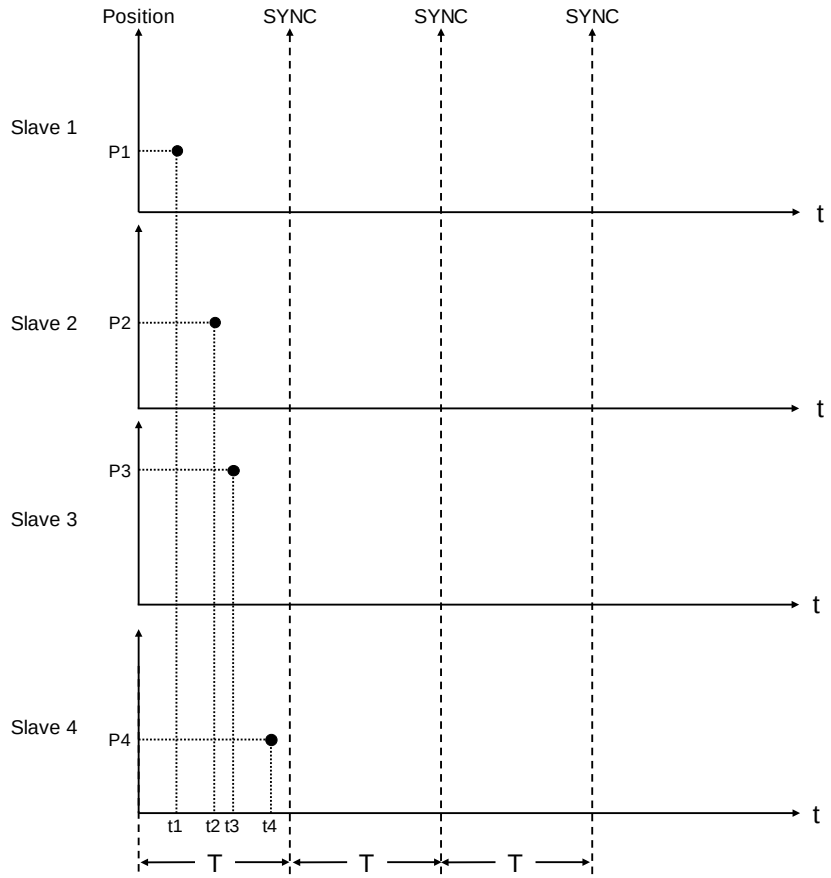
Oó' AX Lâ!þ3Ž" &O!]5 2è CoE ‹ CANopen over EtherCAT Œ.{E #6[• • „AN CiA402 Y«Rê2'5 2èFk_·"•: .ö#Ö!í ! •$O7 #ó;L 4OU ‹Cyclic Synchronous Position Mode ŒÚ$O7 #ó;L` .•: .ö ‹Cyclic Synchronous Velocity Mode ŒÚ$O7 #ó;L2TGÐ: .ö ‹Cyclic Synchronous Torque Mode ŒI´LbFk: .ö • ' ò!þ[Û5õ Û

7.7.2 " ^22e ô

òRi+í[Û5õ' #<_[3Ž" 5[:LâNÆ7•7k Û

7.7.2.1 #&5Ý"Ê:# N,8ß-ÍoÑCyclic Synchronous Positi on ModeoÒ

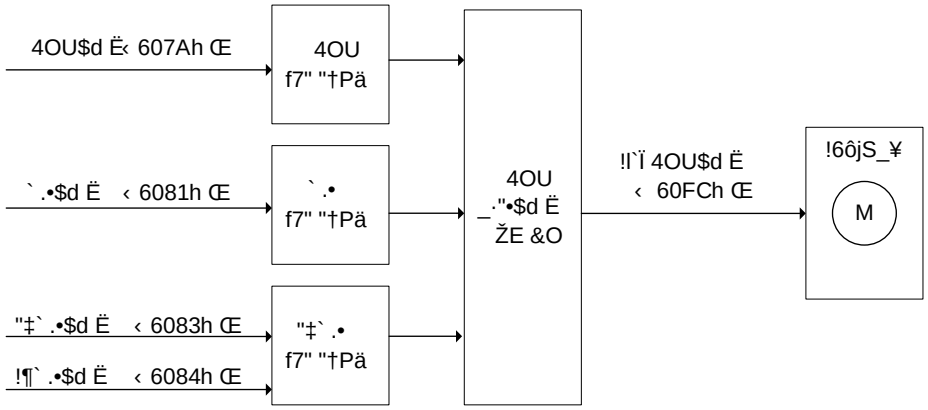
AX Lâ!þ3Ž" &O õ) #× !6ôjX"•&O_Å3Œ5Ý •!]5W3U _ù6 ` _®#ó;L È#Þ+…C—#ó;L •#ó;L È#ÞE 3Ž" &O Ì.f 4”Fk5 .ö#¸!á Û !6ôjX"•&O3Œ5 " 3Ž" &O#¸!áFk3Ž" 5W3U •_À ,3Ž" 5W3U.] ô jS ñE 5/ •fçK0/l#ëjX"•&O!l `Ï[ˆ5W5ÝeÛ_¥" #õ ‹Distributed Clock •DC Œ • Ì;K+…C—) #× !6ôFk#ó;L Û)i ò&å2'l!3Œ6ð&Â#× !6ôjX"•&O • T !#ó;L$O7 Û' #ó;L$O7 !l •&Â#× !6ôjX"•&O!í" ' ô#óFk5Ý"" ‹t1 Út2 Út3 Út4 Œ3Œ#¾" 3Ž" 5W3U • -6 3Ž " 5W3U.]<ˆ6ðE 5/ Û/:2'6ð !6ôjX"•&O[ˆ5W5ÝeÛ" _¥#ó;L È#Þ ‹ SYNC Œ#õ •3Ž" 5W3U#ó5ÝE 5/ Û



<Ï •$O7 #ó;L 4OU: .ö fE u#ó;L_[Û

7.7.2.2 N,X, Ð8ß-ÍoÑProfile Position Mode oÒ

!6ôjX"•&O3Œ5 " E ñ 43Ž" &O‹Ì òKgI× å ñ 47! æŒ _èFk 4OU$d Ë#õ •jX"•&O3Ž" !6ôE 7!" _¥FÕ7î 4OU Û' 4OU3Ž" : .ö ˚ ò • ñ 47! ¬' ç.ç)²5Ý$1GìjX"•&OFÕ7î 4OU Ú` .•$d Ë õ"‡!¶` K0Fß!Z[¥+• Û µ$d Ë Yí#¸" " _¥FÕ7î 4OU_À eÛFk_·"•Y«!ù •`ä6 E jX"•&O!l`ÏFk_·"•$d Ë ŽE &O#¢2NX3 Û

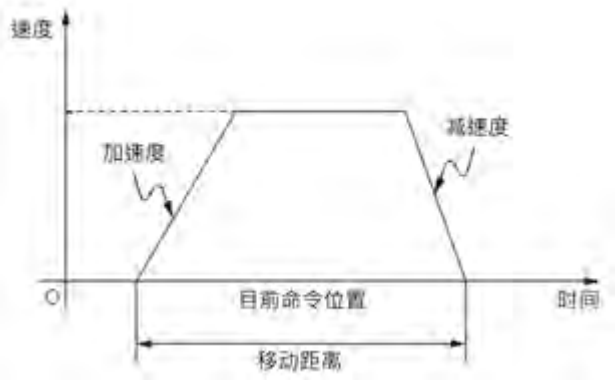


<Ï • 4OU3Ž" : .ö fE u+• 4_[Û

7.7.2.3 *X

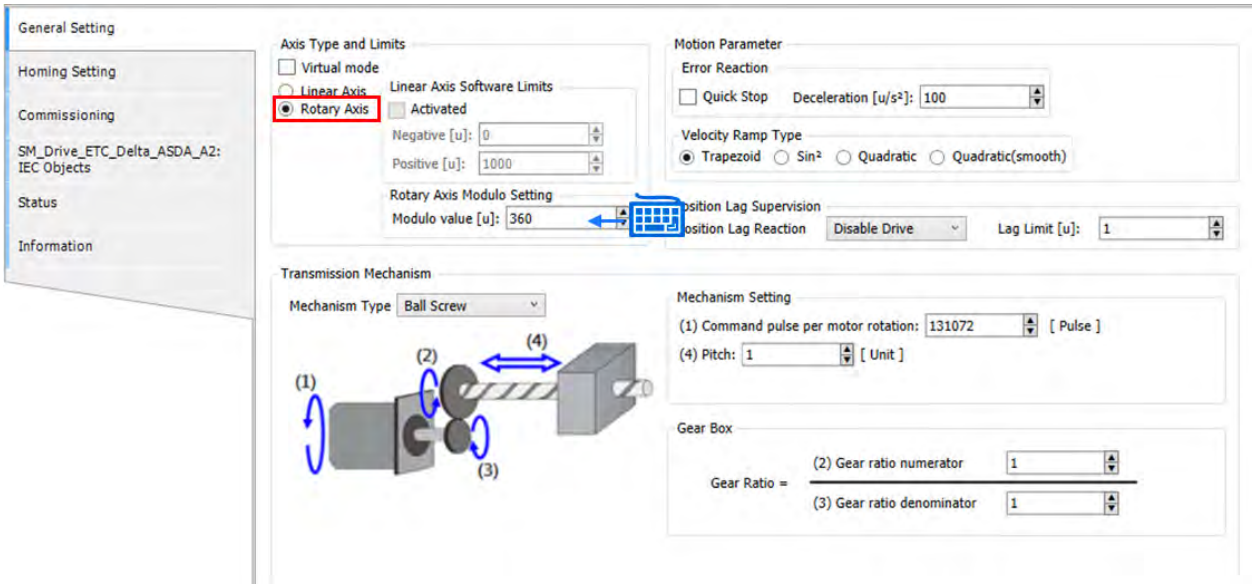
z M›*·*¹%þ

"†Pä'> „3UE 2 _z!L[¥+• # õ/:"4 4OUY«!ù_[lâ"•6ÙN¦ • f_[lâ"•QÚ Ì#†@ !'á!-@ FkFÕ7îNÄ+à 4OU Û ;K(ý5²_S_[FkNÄ+à 4OURê&Û • #¾f7 u5²_S_[Fk5²_S$O7 Rê&Û Û[Í0¬#Ö#ØMoveAbsolute "†Pä'> ÛNÄ+à +â"Fk_·"•_O_à)i ò&å2'I! Û



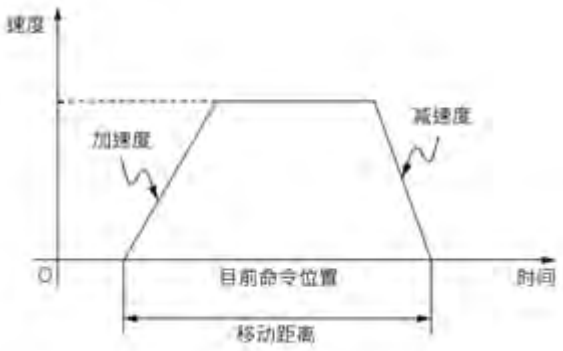
„ 5²_S_[[¥+•

- _[[¥+•E"gI_ð2Ð Rotary Axis #õ •' Modulo value [¥+•5²_S_[Rê&Û Û



z E¶*·*X

"†Pä'> „3UE 2 _z!L[¥+• # õ/:"4 4OUY«!ù_[Iâ"•6ÙN¦ • f_[Iâ"•QÚ Ì/:"4 4OU !'á!-@ FkFÕ7îFß+à 4 OU Û[Í0¬#Ö#©AMC_MoveRelative "†Pä'> ÛFß+à+• 4Fk_·"•_O_à)i ò&å2'I! Û



7

7.7.2.4 : 4w-Í

_[C;I0¬!œ"ì$ E 2 ` _® _·"•2î Ë f_[C;I •1ý6 H—7hf7 •_[#¸E .é. e [Ö+ãQÛ C;I Û_[#¸E .é. e [Ö+ã QÛ C;IFke [Ö=ìfK Û

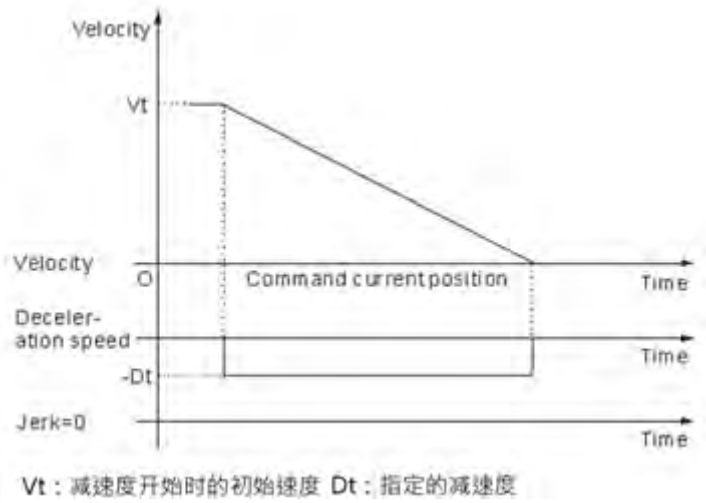
z ` _®_·"•3Ž" 2î Ë C;I •fç C;I#<_["• C5Ý •.{ fE MC_Stop2î Ë1ýMC_Halt 2î Ë Û

MC_Stop

- MC_Stop „2î+•Fk5 .ö C;I;J' _·"• Fk_[.]+í_[B•/è_S !“ Stopping” Û
- ;K2î Ë 5” â <;J' 2NX3 Fk2î Ë Û/:;K_[FkB•/è' “Stopping ”5Ý • â <2î Ë`ä ôPä2NX3 Û
- B•/è“ Stopping” 2èNÔ" _¥` .•0 1ýOì6 Execute#¿1⇆False Û/:_¥" ` .•0 •DonejS ñ#¿ !True Û
- /:Done#¿ !True û Execute#¿ !False •_[_Â!L “Standstill ” B•/è Û

MC_Stop_·"•_O_à)i ò&å2'I!

` .• „3U3U2î+•Fk!¶` .•Dt Oó!š+•



MC_Halt

- MC_Halt6i5Ý C;I;J' _·"• Fk_[.] û+í_[B•/è_S3IQÚ “DiscreteMotion” çFÛ" _[` .• !0 Ûː_[C;I5Ý • C;I"• C+s1÷#õ_[B•/è _Â!L“Standstill ” Û
- ' _[!¶` Fk7 eÛ#Ö Ì2NX3!]+j _·"•2î Ë7LJ²#Z 5” MC_HaltFk_· C

z H—7hf7#õ C;I

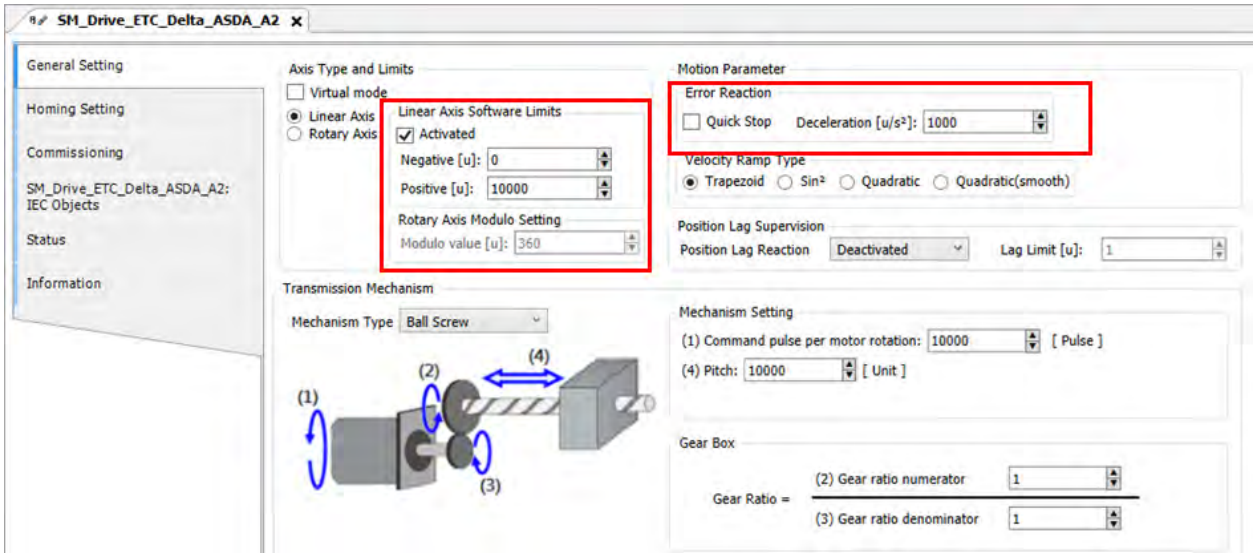
_V Ý7hf7 •

_V Ý7hf7#Ö' _[#©5W[¥+•h\gI_ÂX3.ç$ /!ZeÔ •.][¥+•!]Rê&Û Û

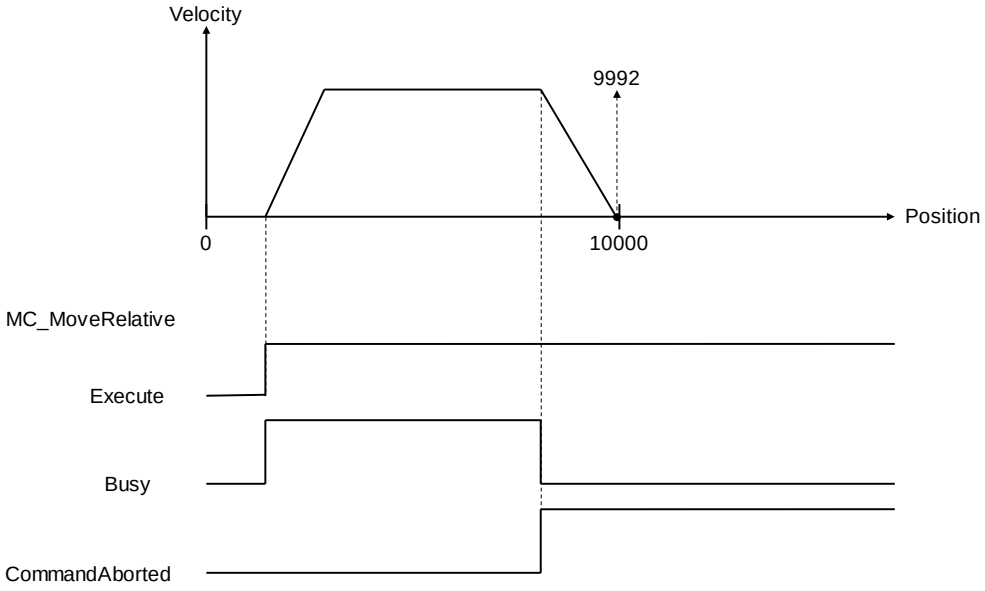
/:_[' _·"• 3Œ_,_V Ý7hf75Ý • Ì_[#©5WFk!¶` .•Y«!ù!¶` C;I •.] C;I' _V Ý7hf7!l Û

_V Ý7hf7Rê r)i ò •

- _V Ý7hf7[¥OU;J7hf7 ! 10,000 #´7hf7 ! 0 .].ç$ _V Ý7hf7 ‹ Activated Œ•.][¥OU!¶` .• ! 1,000 Û



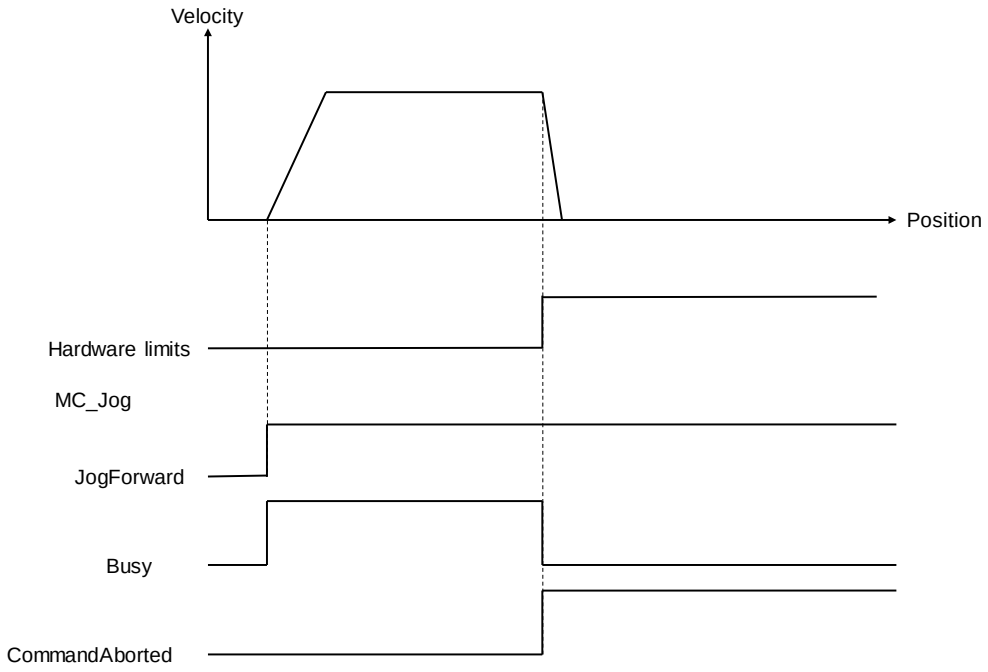
- fE MC_MoveRelative "†Pä'> •.]+• 4QÚ 11,000 #õ$ "•[Ì"†Pä'> •/:_[Iâ"•QÚ 8,000 -Í#Ú#õ •"†Pä'>Fk Busy E TRUE _S ! FALSE û CommandAborted E FALSE _S ! TRUE •_[.ç)²!¶` QÚ_V Ý7hf7!lFk 4 OU Û



HS Ý7hf7 •

HS Ý È#Þ FÛ3Œa4N¦'EtherCAT !6ô_[ñ •&Ç;K#ë+••do+àHS Ý7hf7 C;I5 .öEL6ð ô#ó Û Ì ò Ì#×_¥ ASDA-A2-E !6ô ! r •

- fE MC_Jog2NX3_[;J_S • -_[_·_S `." 7hf7.ç!Z • ASDA-A2-E J²#Z C;I_·_S •.]` _®` [–&Å2Œe [Ö Û



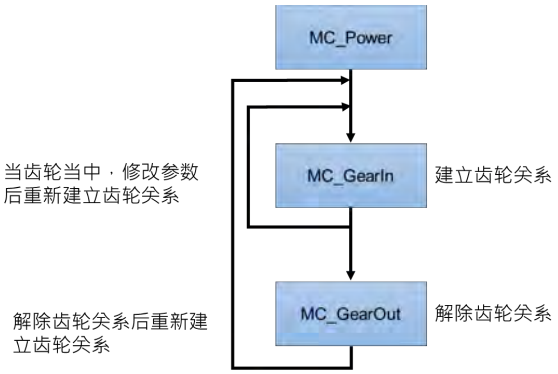
/:H—YÍ_V ÝHS Ý7hf7#õ •#Ö fE MC_Reset =ìfKe [Ö#õ •LâNÆ QÑ"•+í$d Ë 4OU+í „3U+…f, 4OU #_ÂX3#ó ;L •.]2NX3Q I¢7hf75 #ø#Z#Ö!t;J. _·X3 Û

7.7.2.5 Có* n=^,oÑMC_GearI noÒ

/:6ð " µ_[fç „3U;» r_ÂX3#ó;L_·"•fç<) •#Ö fE MC_GearIn 2î Ë2NX3of_U"• C ÛOóMC_GearOut 2î Ë 2NX3#õ • µ_[Ì2NX3/: ò µ_[$d ËQ I¢#ó;L_·X3.]K0` _·X3 Û[ÍN-"†Pä'> fE [Þ#©Oê AX K¹ Õ^Ž!f2e ô1Å ¢ 1 J Û

MC_GearIn 2î+• "_[õ µ_[Úof_U;»!í+7 Úof_U;»!í;´ Ú"‡` .• Ú!¶` .• Ú"‡` .•Fk#¿"ýCn ‹]ª.• Œ Û

z E +7of_UFß!ZFk2î Ë2NX3ha.v)i ò •



/:2NX3 MC_GearIn #õ µ_[B•/è7!_Â!L Synchronized motion •' 2NX3 MC_GearOut f µ_[Q I¢#ó;LB•/è #õ • µ_[NÛ2èQ I¢G“eÛFk` .•NÎNÔ_·"• • µ_[B•/è7!_Â!L Continuous Motion Û

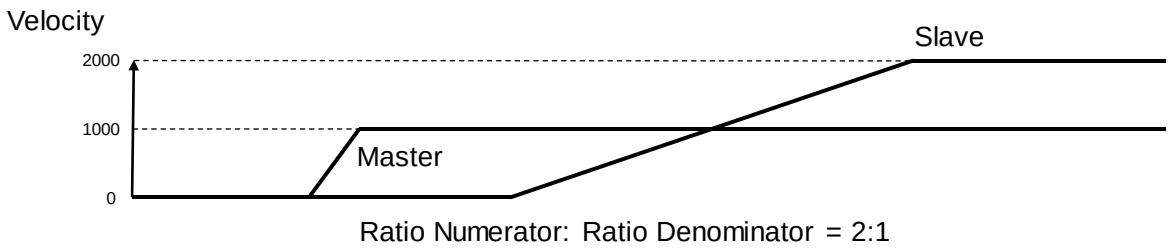
' #ó;L_·"•5Ý •+à µ_[2NX3 MC_Stop •;K5Ý MC_GearIn X'2:5" • "_[B•/èNÛ2è Continuous Motion NÎ NÔ_·_S • µ_[" _Â!L Stopping •FÛ" MC_Stop Fk Done 2° òB•/è24 &Å" standstill Û

µ_[B•/è7!' Synchronized motion 5Ý • µ_[Fk` .• ]Æfv "_[Fk` .•.]N¶E of_U;»7L[ê5[Û

/: "_[µ_[_Â!L#ó;LB•/è#õ • fE MC_SetPosition 2î Ë Ì!4` 1÷E 7!0 ` _·_S ŽE r5, Û

z ` _® MC_GearIn Fk RatioNumerator ÚRatioDenominator 7L[¥+• "_[Ú µ_[eÛFkof_U;» Û

/:of_U;» !;J #5Ý • "_[$s µ_[ÌFß#óFk5 #ø_·"• Û



Ratio Numerator: Ratio Denominator = 2:1

/:of_U;» !] #5Ý • "_[$s µ_[ÌFß#´Fk5 #ø_·"• Û

z /: µ_[` .•_¥" 2î Ë[¥+•Fk` .•5Ý • "_[õ µ_[+s1÷#ó;L Û

/: MC_GearIn $ "•5Ý • µ_[.ç)²%U#ï "_[Û µ_[` .•" _¥ 2 ôFk "_[` .• ‹RatioNumerator • RatioDenominator = 2 • 1 Œ Û

InGear = True • " µ_[+s1÷#ó;L • µ_[_[B•/è_Â!L Synchronized Motion Û

MC_Stop $ "•#õ • "_[.ç)²!¶` • µ_[ F „of_U;»#ó;L!¶` Û

' MC_Stop _·X37 eÛ • MC_GearOut $ "• • " µ_[Q I¢#ó;L • µ_[Ä2è/: òQ I¢5ÝFk` .•NÎNÔ_·"• • µ_[B•/è7!_Â!L Continuous Motion Û

7.7.2.6 N,1Å*XCó* n=^,oÑMC_GearInPos oÒ

E 2 #Ö Ì fE MC_GearInPos 7L2î+• "_[õ µ_[]^)²Fk#ó;L 4OU Û

z MC_GearInPos 5Ý.v

MC_GearInPos 2î+• "_[õ µ_[Úof_U;»!í+7 Úof_U;»!í;´ Ú "_[õ µ_[#ó;L 4OU Ú.ç)²2NX3#ó;LFk "_[]ÄI¢ õ6 $!([Ÿ#´_S Û"†Pä'> „3U[¥+•QÑX3Y«!ù µ_[Fk_·"•6ÙN¦ • f "_[õ µ_[' 2î+• 4OU+s1÷%U#ï Û

"_[.ç)²_ÂX3#ó;LFk 4OU ! MasterSyncPosition ‹180 Œ – MasterStartDistance ‹50 Œ •/: "_[" _¥[Ì 4OU#õ •StartSync œTrue .ç)²_ÂX3#ó;L Û

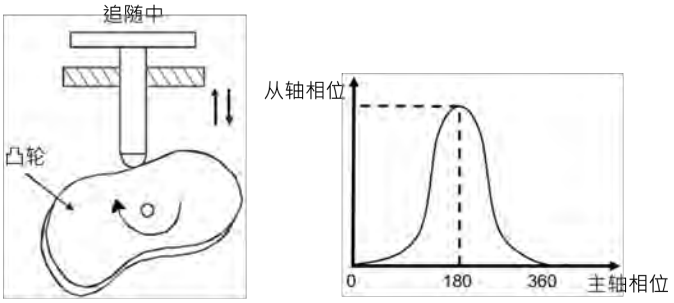
µ_[" „3U!]+j #©5WQÑX3Y«!ù ç7H_·"•6ÙN¦ •.]' "_[" _¥ MasterSyncPosition ‹180 Œ5Ý •#ó5Ý µ_[4 F" _¥ SlaveSyncPosition ‹90 Œ • StartSync œFalse ÚInSync œTrue #ó;L+s1÷ Û

RÌ MasterStartDistance ‰0 •"†Pä'> ç2NX3, #ó;L+s1÷ •;K5Ý µ_[4OU FÛ3Œ]Ú"•" 2î+• µ_[#ó;L 4OU Û

RÌ7!7k ñ ô!([Ÿ µ_[#´_S •E 2 hb+í AvoidReversal [¥OU ! True Û

7.7.2.7 Có* ¶^,oÑMC_CamIn oÒ

µ_[8 3U!ß_UXOFk È0V]Æfv "_[C#ó;L_·"• Û` _® MC_CamTableSelect hk!/2î+•E +7!ß_U_·X35Ý2'`\'‘ Fk!ß_UXO •.]2î+• " µ Ú µ_[Û` _® MC_CamIn 2î Ë%U#ï!ß_U •MC_CamOut 7LYÊfKof_U%U#ï Û



%U#ï#õ • " µ_[ha" +s1÷#ó;L •;K5Ý µ_[FkB•/è7!7L" Synchronized Motion Û Ì ò[Û5õE +7!ß_U.áJ²Fß !Z È0V •

- Û(‰Z|*X

z .áJ²E +7!ß_U5W3U

E +7!ß_UFk6ÙN¦5W3U.áJ²#Ö` _® Ì ò I´5 <¼N¿" •

5 <¼ 1 •8 3U7î!-!ä5W!š+• " µ_[4OUFk!ZLâ Û

5 <¼ 2 •8 3U+…f,-Ì C =2a¶" " µ_[2eÛFk+à.{!ZLâ Û

- Có* ¶^, ù Œ^2EBZ|*X"^3‹

E +7!ß_UFk " µ_[[¥+• õE +7!ß_UFk4´ C •fç` _® MC_CamIn ÚMC_CamTableSelect #Z#Ö_¥1÷ Û

z "_[õ µ_[7L>w[¥+•

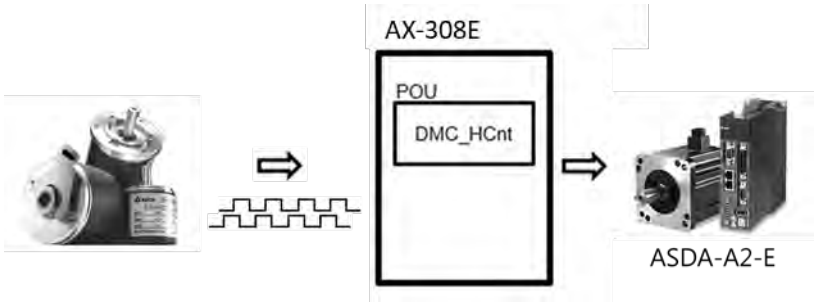
` _® MC_CamTableSelect ÚMC_CamIn "†Pä'>Fk_z!L.üQ Master !š+• "_[7L>w •Slave !š+• µ_[Û

<Ï •[ÍN-.üQ "†Pä+• 0 •[Þ#©Oê AX Lâ!þ_·"•3Ž" 2î Ë22!s

z "_[!(ý`Ï[^5W&O

E +7!ß_UFk "_[7L>w#Ö!í !+…_[#±VA2Æ_[õ[^5W&O Û)ifç fE (ý`Ï[^5W&O5Ý/: "_[7L>w5Ý •" fç fE DFB_HCnt "†Pä'>$ "•(ý`Ï[^5W"†Pä Û

LâNÆ7•7k õDMC_HCnt "†Pä



7

z "_[4OU õ µ_[4OU 2eÛFk!ZLâ

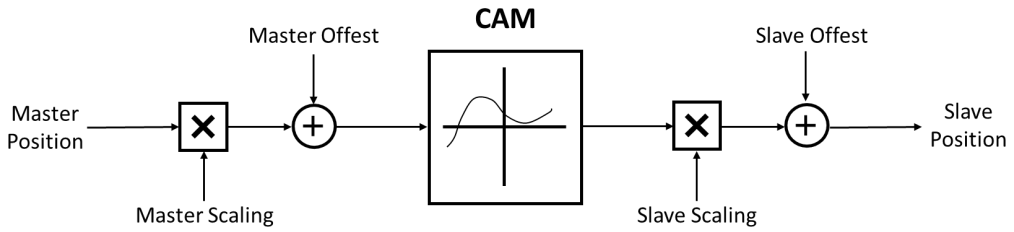
` _®_V Ýhk!/Y«!ùFk!ß_U!ZLâ6 " µ_[2eÛFk 4OU!ZLâ •!]!ß_UXOFk 4OU ! " µ_[Fk!ß_UFß 4 •OógE+…f, _[4OU ÛRÌ+íhk!/Y«!ùFk!ß_U!ZLâY- !!ä5W CAM•'ä5W CAM Fk_z!L ! "_[!ß_UFß 4 •_z!á ! µ_[!ß_UFß 4 •)i ò2'I! •

x • "_[!ß_UFß 4 y • µ_[!ß_UFß 4

y = CAM ‹x Œ

!ß_UFß 47L>w u_[4OU •+j Ó 2eÛ+?' 3IK~!ZLâ Û_[4OU õ!ß_UFß 4 2eÛFk3IK~!ZLâ õ#©5W MasterAbsolute ÚSlaveAbsolute ÚMasterOffset ÚSlaveOffset ÚMasterScaling ÚSlaveScaling 6ð!Z Û

µ_[' MC_CamIn 2î ËFk CE ò]Æfv "_[A!ß_U#ó;L_·"• Ûß_U#ó;L_·"• •" µ_[Fk_[4OU+à.{!ZLâ.á J²' hk!/Y«!ùFk!ß_U!ZLâ ‹!ß_U!ZLâ6ÙN¦1ý!ß_UXO Œ'áH' 2 ñ •E "_[_[4OU[ˆK~ µ_[_[4OUFk_®Iò)i ò&å2' I! •



E ñ&å/~!á[ˆK~5 <¼)i ò •

Position_Slave = SlaveScaling×CAM ‹ MasterScaling×MasterPosition + MasterOffset Œ + SlaveOffset /: "_[6 NÄ+à: .ö • "_[4OU6 "_[C—' 4OUFk5²_S_[_·K~Nº7ƒ ž/: "_[6 Fß+à: .ö • "_[4OU6 Fß+à.{!ß_U Fk.ç)²@ ‹` . 6 0 Œ Û

z StartMode õ CamTableSelect Fk MasterAbsolute ÚSlaveAbsolute 2!ZLâ

NÄ+à: .ö ‹StartMode = 0 Œ •' E +7!ß_U#ó;L.ç)²5Ý •!ß_UFk[ˆK~ õ µ_[/:"4Fk 4OU5Ç!Z Û)i7ƒ µ_[/: "4 4OU õ[ˆK~#õFk]^)² 4OU ô#ó •" ` 1÷]Ú"• Û

Fß+à: .ö ‹StartMode = 1 Œ •!ß_U 8 3U/:"4 µ_[Fk 4OU_ÂX35 #¿ ž µ_[4OU X'/:"4 µ_[4OU_ÂX3 4 OUFß"‡Fk[ˆK~ Û)i7ƒ µ_[%U#ï5Ý 4OU õ[ˆK~#õFk]^)² 4OU"‡/:"4 4OU ô#ó •" ` 1÷]Ú"• Û

ramp : .ö ‹ StartMode = 2 • 3 • 4 Œ •„3U VelocityDiff ÚAcceleration ÚDeceleration ÚJerk •7L(…"‡ ç XL f_·"•6ÙN¦ •f ;I!ß_U' .ç)²%U#ï5ÝFk]Ú"• Û

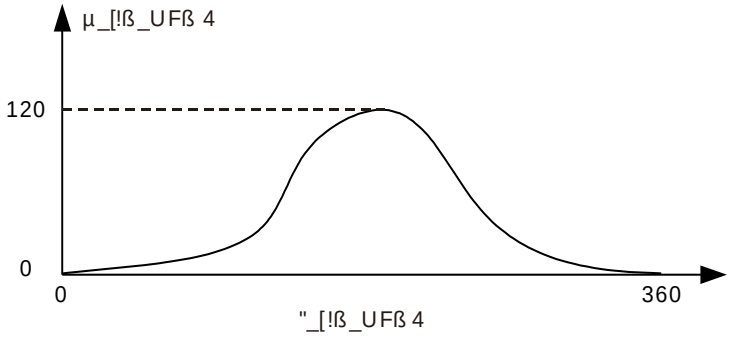
MC_CamTableSelect.MasterAbsolute	"_[: .ö
absolute	NÄ+à: .ö
relative	Fß+à: .ö

MC_CamIn.StartMode	MC_CamTableSelect.SlaveAbsolute	µ_[: .ö
absolute	True	NÄ+à: .ö
absolute	False	Fß+à: .ö
relative	True	Fß+à: .ö
relative	False	Fß+à: .ö
ramp_in	True	Ramp in NÄ+à: .ö
ramp_in	False	Ramp in Fß+à: .ö
ramp_in_pos	True	;J#ø Ramp in NÄ+à: .ö
ramp_in_pos	False	;J#ø Ramp in Fß+à: .ö
ramp_in_neg	True	#´#ø Ramp in NÄ+à: .ö
ramp_in_neg	False	#´#ø Ramp in Fß+à: .ö

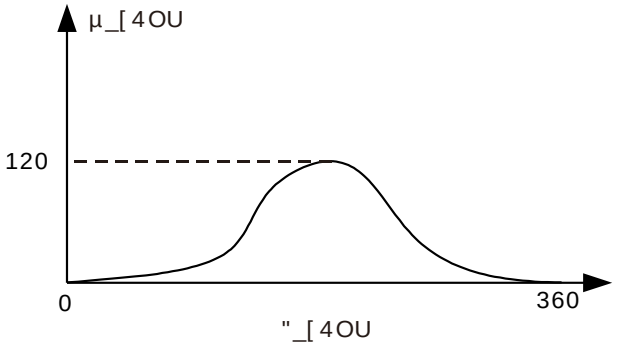
z 6Iâa¶ õO 5% ‹ MasterOffset/MasterScaling/SlaveOffset/Slavescaling Œ

" µ_[Fk!ß_U!ZLâ !hk!/Y«!ù • -' 2NX3!ß_U5Ý •#Ö` _®#©5W Offset $s Scaling ' hk!/Y«!ùFk!ß_U!ZLâ'á H' ñ_ÂX3 4OU 6Iâ1ý 4OUO 5% • r)i •"‡-ÌFk#ó ç Ž$¨6ð!ÇI´ ô#ó,!+ß •" #ÑfçY«!ù çI´!ß_U!ZLâ •A #õ` _® 5 #¿#©5WØffset $s Scaling Ì_é.{ ô#ó,!+ß Ž$¨ 2eÛFk"‡-Ì!î3I ÛE 2 #Ö2î+•O 5%Lâ5W#¢O 5%!ß_UXOFk "_[Fß 4 õ µ_[4Iâa¶ Û "_[õ µ_[#Ö!í" [¥+• " Fk 6Iâa¶ õO 5%Lâ5W Û

" µ_[Fk 4OU 6Iâ$s;» rO 5%!X#ó!š+•+…f,2NX3Fk!ß_U!ZLâ •!] CE 5/7ƒ` _® Ì òRê r_ÂX33¶_× Ûhk!/Y« !ùFk!ß_U!ZLâ)i ò&å2'I! •

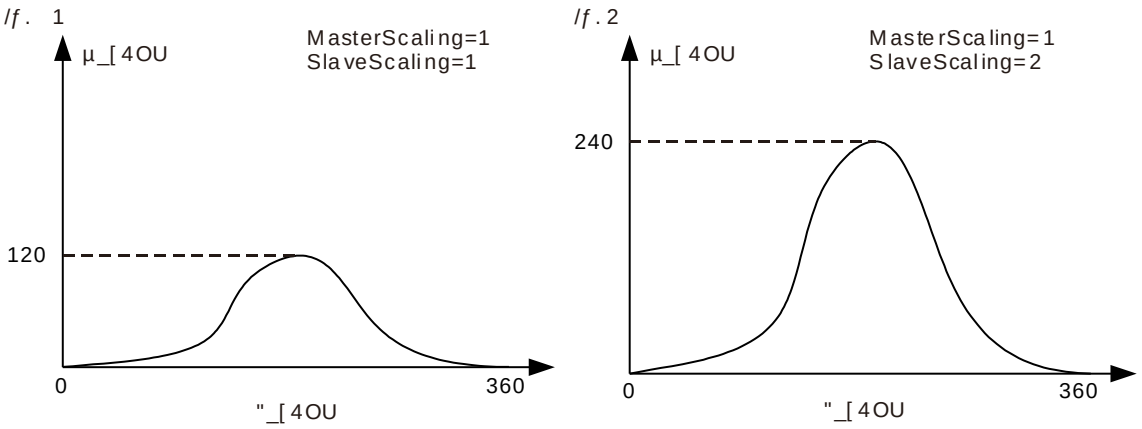


RÌ " µ_['. !NÄ+à: .ö • û2NX3%U#ï"• C5Ý • " µ_[Fk_[4OU'. ! 0 •' ô fE 6Iâ$sO 5%5Ý ‹n¿[‹ # Œ • !ß_U2NX3_®Iò Fk " µ_[+…f, 4OU+à.{!ZLâ)i ò&å2'I! •

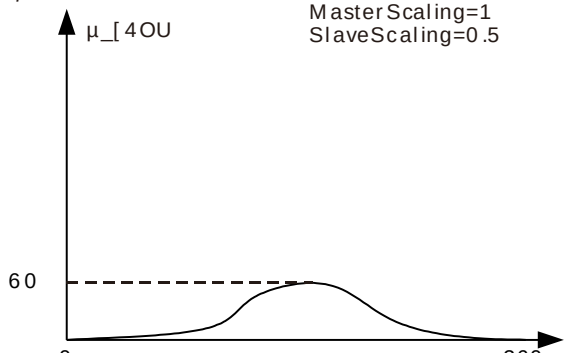


/: 4OU 6Iâa¶1ýO 5%;» r ô !n¿[‹ #5Ý •!]+à!ß_U2NX3_®Iò " µ_[+…f, 4OU+à.{!ZLâFk/X$´)i ò •

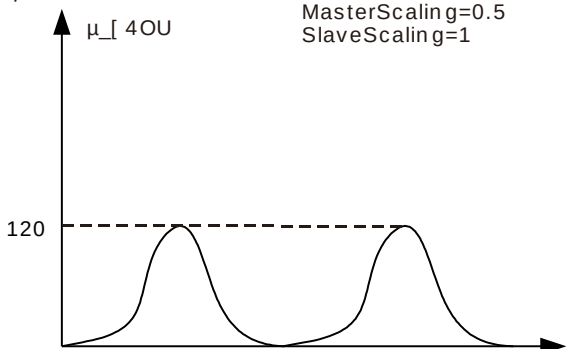
" µ_[6Iâa¶ ! 0 • " µ_[O 5%;» r+à+…f,2NX3Fk!ß_U!ZLâFk/X$´ Û



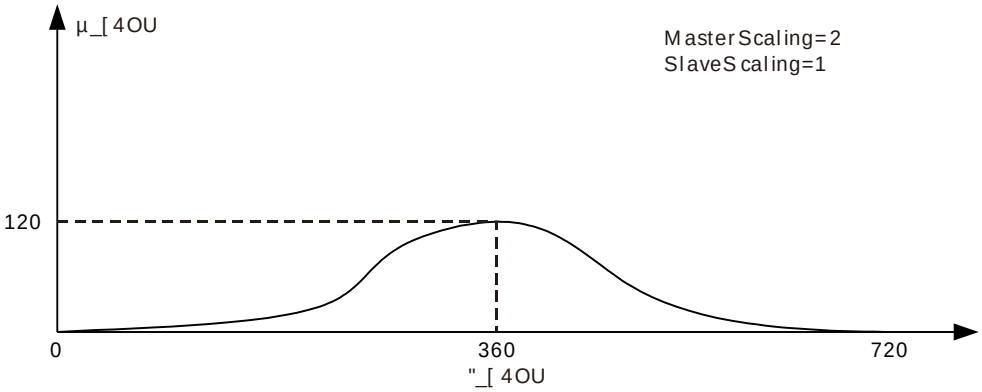
/ƒ. 3



/ƒ. 4



/ƒ. 5



/Ä.a 1 • /: " µ_[O 5%;» r ! 1 • 6Iâa¶ ! 0 5Ý •+…f,!ß_U!ZLâ õhk!/Y«!ùFk çQÛ Û

/Ä.a 2 • /: "_[O 5%;» r ! 1 • µ_[O 5%;» r ! 2 • " µ 6Iâa¶ ! 0 5Ý • õ "_[4OU+à.{Fk µ_[4OU #¿ !hk!/Y«!ùFk ô Û

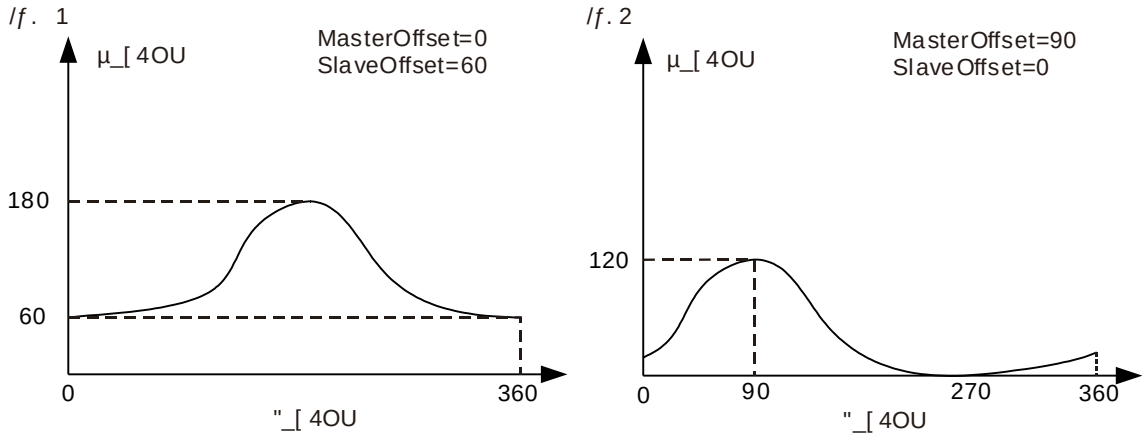
/Ä.a 3 • /: "_[O 5%;» r ! 1 • µ_[O 5%;» r ! 0.5 • " µ_[6Iâa¶ ! 0 5Ý • õ "_[4OU+à.{Fk µ_[4OU#¿ !hk!/Y«!ùFk 1/2 Û

/Ä.a 4 • /: "_[O 5%;» r ! 2 • µ_[O 5%;» r ! 1 • " µ_[!ß_U 6Iâa¶ ! 0 5Ý • õ µ_[4OU+à.{Fk " _[4OU#¿ !hk!/Y«!ùFk ô Û)i7ƒ µ!ß_UFß 4FkY¹.•Fò •' 6 "_[Fk!ß_UFß 4 !hk!/Y«!ùFk ô •#Z "_[!ß_U$O7 µ 360 #¿ ! 180 • µ_[!ß_UFß 4 ô#¿ Û

/Ä.a 5 • /: "_[O 5%;» r ! 0.5 • µ_[O 5%;» r ! 1 • " µ_[6Iâa¶ ! 0 5Ý • õ µ_[4OU+à.{Fk "_[4OU#¿ !hk!/Y«!ùFk 1/2 Û)i7ƒ µ!ß_UFß 4FkY¹.•Fò •" 6 "_[!ß_UFß 4 !hk!/Y«!ùFk 1/2 • #Z "_[!ß_U$O7 µ 360 #¿ ! 720 • µ_[!ß_UFß 4 ô#¿ Û

" µ_[O 5%;» r ! 1 • " µ_[6Iâ+…f,2NX3Fk!ß_U!ZLâFk/X$´ Û

"_[6IâFß/: u+í2NX3!ß_U5ÝFk+…f,_[4OU!ZLâ6ÙN¦ C: #øIâ"• ž µ_[6IâFß/: u+í2NX3!ß_U5ÝFk_[4OU !ZLâ6ÙN¦ CNœ#øIâ"• Û

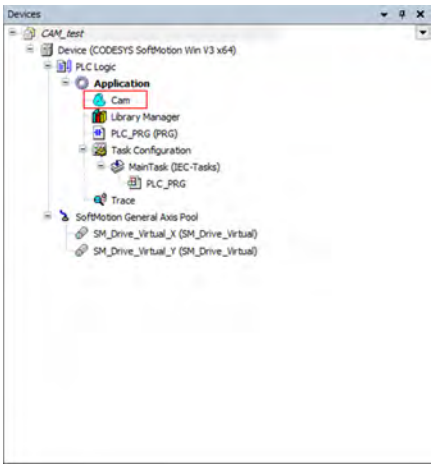


/Ä.a 1 • /: " µ_[O 5%;» r ! 1 • "_[6Iâa¶ ! 0 • µ_[6Iâa¶ ! 60 5Ý • õ "_[4OU+à.{Fk µ_[4OU'.' hk!/Y«!ùFk'áH' ñ"‡ ñ 60 Û r)i •Y«!ùFk!ß_U!ZLâ • "_[_[4OU 180 +à.{ Fk µ_[_[4OU ! 180 •+…f,2NX35Ý •+à.{Fk µ_[_[4OU ! 240 ‹240=180+60 Œ Û

/Ä.a 2 • /: " µ_[O 5%;» r ! 1 • "_[6Iâa¶ ! 90 • µ_[6Iâa¶ ! 0 5Ý • õ µ_[_[4OU+à.{Fk " _[_[4OU' hk!/Y«!ùFk'áH' ñ 6Iâ 90 ‹"‡ ñ 6Iâa¶ Œ Û r)i •Y«!ùFk!ß_U!ZLâ • "_[_[4OU180 +à.{Fk µ_[_[4OU ! 180 •+…f,2NX35Ý • "_[_[4OU 90 +à.{Fk µ_[_[4OU ! 180 •#Zhk!/Y«!ùFk!ß_U!ZLâ "_[_[4OU 180 ‹180=90+90 Œ2'+à.{Fk µ_[_[4 Û

- ¶^,W&

' DIADesigner-AX h`FÕ7ø •#Ö.áJ² Cam +à\H •' ;K+à\H #Ö ÌQÑX3Ný_x!ß_U6ÙN¦ Û Oó6ÙN¦'r.ö!š+• m µ_[!ß_U_·X3FkNº7ƒ Û



z !ß_U6ÙN¦XOB`@ •

‹ #Ö µ!ß_U6ÙN¦#ÖFÛ3ŒY©+Æ+à.{Fk µ_[_·"•Rê&Û õ` .• Ú"‡` .• Ú"‡` .•Fk#¿"ýCn ‹]ª.• ŒFk â ç5Ý ""#¿"ý Û' ;¶ ç !Ze @ 2eÛ#Ö Ì[¥+•6ÙN¦Lb'r •#Ö[¥+• !FÛN¦1ýOì6 {; 6ÙN¦ Û

‹ "_[Fk]^)²'77în¿[‹ µ 0 .ç)²" 360 Nº7F •E 2 #Ö Ì8 3U+…f,FkBPCíX3Iò_ÂX3 Õ5 Û

z !ß_U6ÙN¦Ný_x5 .ö

‹ DIADesigner-AX &å'rNý_x5 .ö •

E 2 Ì&å/I5 .öFkNý_x CAM !ß_UXO •: '77îXOI! "_[4OU •!ß_UFk_·X3X3Iò#½!š u "_[Fk_[ef.• • E"gI !X6ð 4 7H6ÙN¦ •!í" XOI! 4OU Ú` .• Ú"‡` .• Ú"‡` .•Fk#¿"ýCn ‹]ª.• Œ` .•6ÙN¦ Û' [¥[ˆ!ß_U 5Ý •#Ö ÌU°E 4OU6ÙN¦ Ú` .•6ÙN¦7L_ÂX3_·"•X3Iò ñFk[ê5[ •[ê5["‡` .•6ÙN¦Pä f_·"•6Û"‡.ZJ Û

‹ DIADesigner-AX XO8#Ný_x5 .ö •

_V Ý ñfK m3· ,&å/I5 .öNý_x • F#Ö Ì' Cam Table FÛ3Œ_ÂX3!Ze @ Fk(…!¶ õ 4OU ñFk Õ5 Û

‹ Iò.vNý_x •

E 2 F#Ö ÌE Iò.v7L Õ5 CAM !ß_UXOFk!Ze @ •RÌ)i ògIIò.v Õ5 •;K5Ý[Ì!ß_UXOFk]^)² 4OU‹ " _[• µ_[Œ µ ‹ 0 •0 Œ : ‹ 0 •30 Œ • -6 _V Ý ñFkE"gI ô fv 2 Õ5 Û

' Iò.v Õ5 CAM XO#Ö` _®MC_CamWritePoint "†Pä'> Õ5 •)i ò[Û5õ •

b2î+•Fk!ß_UXO

c$ "•"†Pä'>

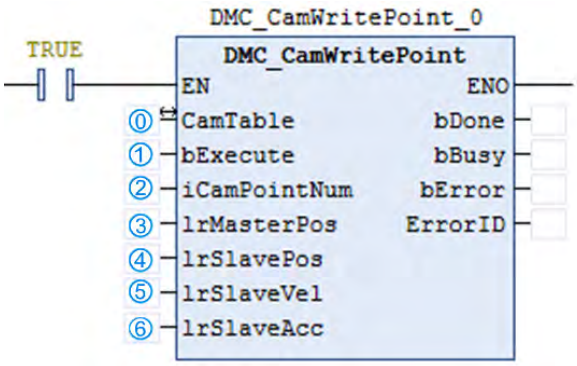
d_ð2Ð[â#½Fk!ß_U@ Ný#Þ

e!ß_U "_[Fk 4OU

f !ß_U µ_[Fk 4OU

g!ß_U µ_[Fk` .•

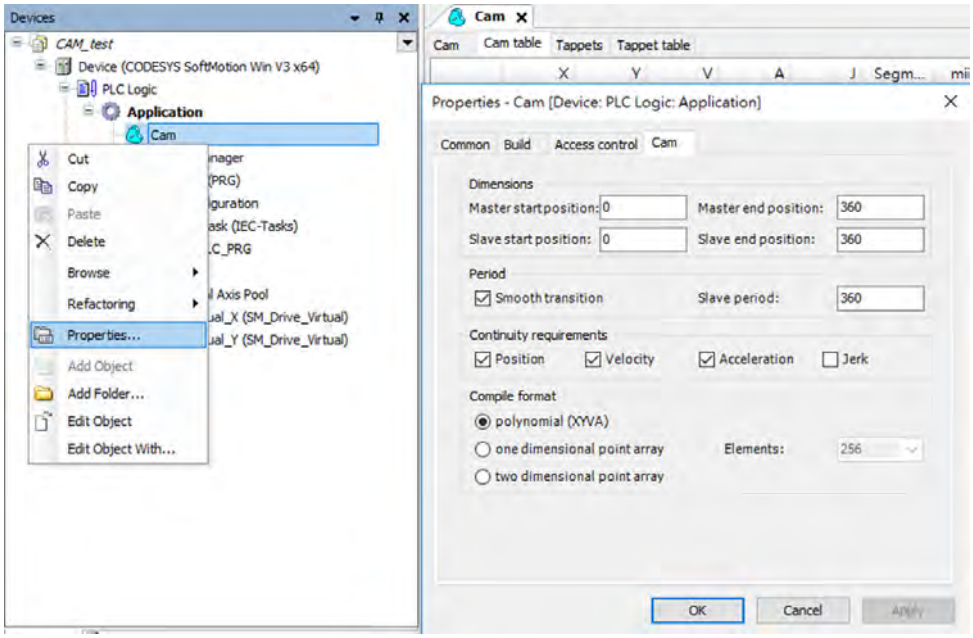
h!ß_U µ_[Fk"‡` .•



<Ï •[ÍN-"†Pä'>[Û5õ[Þ#©Oê AX Lâ!þ_·"•3Ž" 2î Ë22!s Û

z !ß_UXO,E0 [¥OU

E 2 #Ö Ì' Properties J~#Ê •[ê5[!ß_UXOFk,E0 •)i " µ_[Fk]^)² õNº7F 4OU Ú$O7 0 [¥+•#©5W •6ÙN¦ _ÅNÔ0 Fkfç<)$sNý[¸'r.ö Û



z E +7!ß_U fE ;Lj‹ •

a4OU!ß_UXO •[¥+• "_[Rê&Û Ú µ_[Rê&Û •.áJ²]^)²@ ÚNº7F@ õ!]+j!Ze @ •[ê5[6ÙN¦Lb'r Û

fE MC_CamTableSelect 2î Ë+ía4OUFk!ß_UXO_Å3Œ" +…f,!ß_UXO •.]/~'Cam ID [•#õNÔ2î Ë fE Û

Sž/~ Cam ID #õ • fE MC_CamIn 2î Ë+à2î+•Fk "_[õ µ_[_ÂX3%U#ï Û

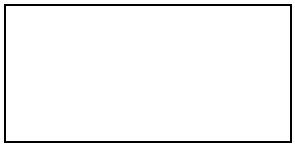
fE MC_CamOut 2î Ë#Ö Ì f _[Q I¢ " µ_[!ZLâ Û‚K(ý' #ó;L_·"•5Ý ✦à µ_[ò_¥ MC_Stop õ MC_Halt Fm#Ö Ì f "_[õ µ_[Q I¢#ó;L!ZLâ Û

z !ß_UXO!î3I

!ß_UXO_·X35Ý#Ö Ì_ÂX3#©Oê!ß_UXOFk!î3I ŁJ₩C_CAM_REF 7L6Û3IMC_CamTableSelect Fk!ß_UXOFk #©Oê Û

‹ #¿a¶+Š$1

‹ !î3I!ß_UXO



ñgIFkRê rIò.v •" E CamTableID Fk!î3I7L5 #¿ MC_CAM_REF • ¦#Ö+…C—) !ß_UXOFk!î3I4´ C m Û / !ß_UXO!í"))i ò •

K ç/ !ß_UXO ‹ Cam Œ

K s/ !ß_UXO ‹ Cam_1 Œ

!ß_UXO!î3I5Ý.v&å

' !î3I!ß_UXO5Ý • µ_[„A `\/'K ç/ !ß_UXO2'Y«!ùFk_·"•_O_à •FÛ" "_[ 4OU" _¥K ç/ !ß_UXO ò ç 1cì?w5Ý •24 .ç)²`\/'K s/ !ß_UXOFk_·"•_O_à Û

7.7.3 ^Ý-d2e ô

` .•3Ž" #Ö!íLb ! ðl´ !6ô3Ž" : .ö$O7 #ó;L 4OU3Ž" ‹Cyclic Synchronous Position • CSP Œõ$O7 #ó;L` .• 3Ž" ‹Cyclic Synchronous Velocity •CSV Œ#±` .•Y«!ù: .ö ‹ Profile Velocity Mode Œ Û

7.7.3.1 CSP 8ß-Í

)iK 7.7.2.1 RiFk ²N´ • CSP : .ö !$O7 #ó;L+• 4: .ö Û¡K: .ö òFk` .•3Ž" •6 3Ž" &O „AN2î+•` .•‹ Ì #±"‡` .• Ú!¶` .• Ú"‡` .•Fk#¿"ýCn ‹]ª.• Œ ŒK~!á;¶ $O7 .{[Ì]W" Fk$d Ë 4OU •A #õ' ;¶$O7 2q$d Ë 4OU òNÀ !6ô2NX3+• 4"• C Û

;K: .ö ò_ÂX3` .•3Ž" 5Ý •)i7ƒ&Ç(ý",.Y2W+ãQÛ/:"4 !6ô 4OUT$#õ u3Ž" &O$d Ë 4OU5Ý • ! m/ XL_À , 4OU[Ö-Õ !áC—` .•2}"•FkC—\H Û

fE MC_MoveVelocity _·"•"†Pä'>2î Ë#Z !' CSP : .ö ò2NX3` .•3Ž" •2NX35Ý_[FkB•/è7! _Â!L continuous_motion B•/è Û#Ö Ì2î+•` .•[ê5[5Ý ‹" _¥2î+•` .•"4 ÚNú!™5Ý ŒFk"‡` .• Ú!¶` .• Ú]ª.• Û fçYh C;I5Ý •#Ö Ì fE MC_Stop ÚMC_Halt Ú1ýOì6 !]+j_·"•2î Ë7L 5” Û

ò&å ! fE MC_MoveVelocity _ÂX3` .•3Ž" 5Ý • Ì MC_Halt 7L_ÂX3 5”Fk5Ý.v&å •

#Ö Ì2î+•` .• ! 0 •;K5ÝVdA g@;I ô"• • -LâNÆB•/è7! ´ ' continuous_motion B•/è Û

AX Lâ!þ #Ö fE MC_MoveVelocity _ÂX3' CSP : .ö ò Fk#<_[` .•3Ž" ¦Z u_·"•"†Pä'>N-Ri[Þ#©Oê AX K¹ Õ^Ž!f2e ô1Å ¢1 J Û

7.7.3.2 CSV 8ß-Í

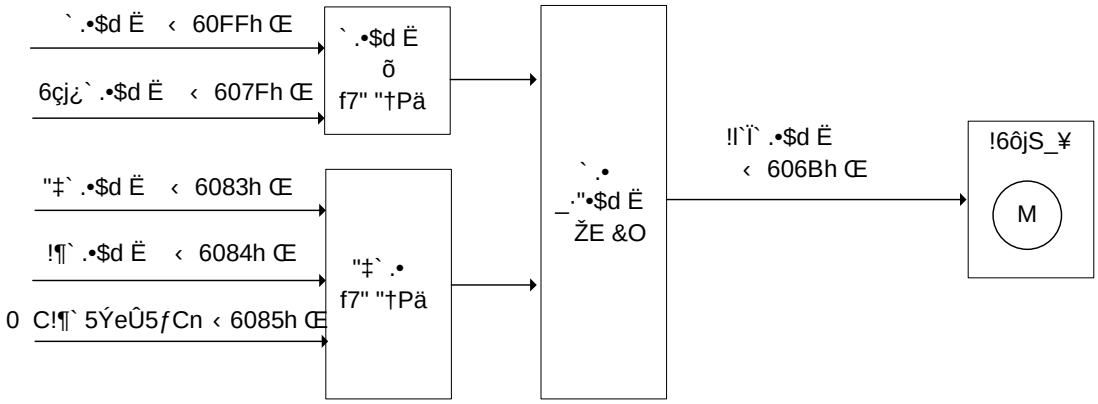
CSV : .ö !$O7 #ó;L+•` : .ö Û;K: .ö òFk` .•3Ž" •6 3Ž" &O „AN2î+•` .• ‹ Ì#±"‡` .• Ú!¶` .• Ú]ª .• ŒK~!á;¶ $O7 FkX3]W` .• •A #õ;¶ $O7 ò2î ËNÀ !6ô2NX3+•` "• C Û

;K: .ö ò_ÂX3` .•3Ž" 5Ý •&Ç !;¶ $O7 `ä6 ò$d Ë` .•NÀ !6ô •#Z f&Ç(ý",.Y2W • F ô !áC—)i CSP : .öFk ! m/ XL 4OU-Õ]Ä+ãQÛ` .•#¿"•FkC—\H Û

AX Lâ!þ #Ö fE MC_VelocityControl _ÂX3' CSV : .ö òFk#<_[` .•3Ž" ‡Z u"†Pä'>N-Ri[Þ#©Oê AX K¹ Õ^Ž!f2e ô1Å ¢1 J Û

7.7.3.3 ^Ý-dX, Ð8ß-ÍoÑProfile Velocity Mode oÒ

' PV‹` .•Y«!ù Œ: .ö ˚ ò • ñ 47!2î+•` .•$d Ë õ"‡!¶` K07H Ý •.]E jX"•&OFk_·"•$d Ë ŽE &O „3U_À ,7H ÝY«!ù!á_·"•_O_à Û



<Ï •` .•Y«!ù: .ö fE u+• 4_[Û

7.7.4 1+F§2e ô

2TGÐ3Ž" #Ö!íLb ! I´ !6ô3Ž" : .ö$O7 #ó;L2TGÐ3Ž" : .ö ‹Cyclic Synchronous Torque • CST Œ õ2TGÐ 3Ž" : .ö ‹Profile Torque • PT Œ Û

z 2TGÐ3Ž" : .ö* ‹Profile Torque • PT Œ

E 2 #Ö` _® DMC_TorqueControl 7L2î+•#<_[2èNÔ ŽE 2î+•_SGÐ_z!á Û

fE <Ï0ö rh` •

' fE DMC_TorqueControl 5Ý • +í3Ž" : .ö!î3I !$O7 #ó;L2TGÐ: .ö Û

' fE DMC_TorqueControl 5Ý •3Ž" : .ö !î3I1÷2TGÐ: .ö •2TGÐ: .ö ò ôPä fE 4Iâ1ý` .•Lâ!þFk"† Pä'> Û ôPäE MC_Stop 7L C;IE 7! •RÌYh C;IE 7! FÛ3Œ+ÐDMC_TorqueControl Enable ! False 5Ý •#ÖJ²#Z C;I Û

Torque ôPä[¥ ! 0 •RÌ[¥OU 0 •DMC_TorqueControl 2Œe Û

[¥+• DMC_TorqueControl Fk Velocity #Ö Ì#ø !6ô[¥+•E 7!Fk6ç) ` .•f7" •` _®;K[¥+•#Ö`f!4' _SGÐ3Ž " : .ö/:E 7!] _d#¿+öOój¿` 5²_S Û

` _®2TGÐ5ƒCn ‹TorqueRamp Œ7L[¥+• •" _¥FÕ7î2TGÐ # ‹Torque ŒFk2TGÐ#¿"ýCn Û

Torque > 0 5Ý •E 7!;J5 #ø_·_S

2TGÐ

$d Ë2TGÐ

2TGÐ5ƒCn

5ÝeÛ

Torque < 0 5Ý •E 7!#´5 #ø_·_S

2TGÐ

5ÝeÛ

2TGÐ5ƒCn

$d Ë2TGÐ

*<Ï •

1. #×_¥6ô"^&OASDAA3-ELâ!þ uV1.1165B/7 Ì ñ5 2è",GÐ;JHU5W #
2. #×_¥6ô"^&OASDAB3-ELâ!þ uV1.0665B/7 Ì ñ5 2è",GÐ;JHU5W #

7.7.5 " ^22e ôEB,öCæ!]O»

ògIdo+à#<_[_·"•3Ž" 5ÝFk. E h`FÕ_ÂX3[Û5õ Û

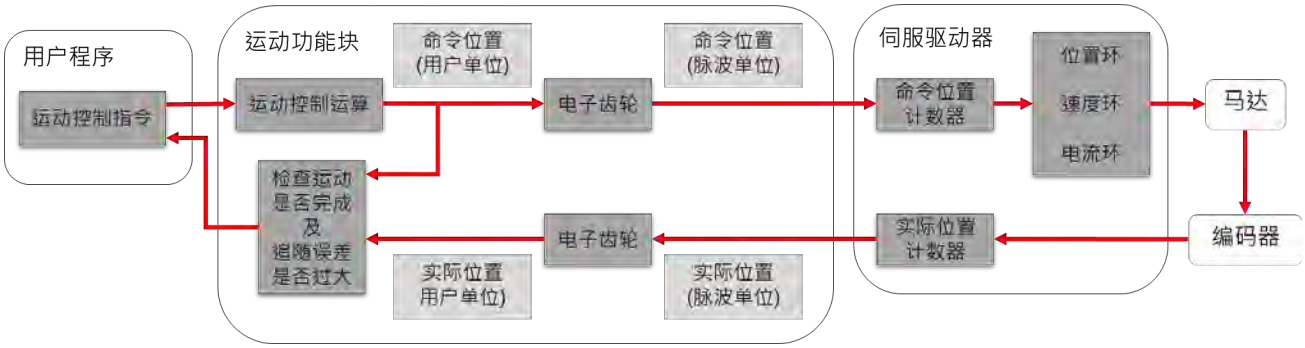
7.7.5.1 N,#; ¢

_[_·"• Fk 4OU#ÖN-!í ! Ì ò 2 l´Lb'r Û

N,K9&I	*X
$d Ë 4OU	_·"•"†Pä'>_z!áE Ì3Ž" _[Fk 4OU
+…f, 4OU	µ !6ôjX"•&O#´io Fk 4OU*

*RÌ !VA2Æ_[•&Ç5Ç !6ôjX"•&O#´io 4OU •+…f, 4OUFÛ3ŒE $d Ë 4OU(R!L Û

Oì 2eÛFk!ZLâ)i ò&å2'I! •



Oì 2eÛFk.é#ó;»_j •

[¥+•	$d Ë 4OU	+…f, 4OU
[^5W: .ö	FÛN¦_[/ 5²_S_[	#ó$d Ë 4OU[¥+•
E 2 #< 4	ef.•#< 4 ‹m • mm • inch… Œ / Y¹.•#< 4 ‹degree Œ / …	#ó$d Ë 4OU[¥+•
_V Ý7hf7	[¥+•_·"•2î Ë#Ö" _¥Fk 4OURê&Ûf7"	#ó$d Ë 4OU[¥+•
+• 4	#Ö+• 4QÚf7+•Rê&Û â0ö 4OU	#ó$d Ë 4OU+• 4 2 4OU • -#ÖPä 6ð_äfv[Ö-Õ*

*<Ï •

#¾" 7!7k#± !6ô[¥+•/X$´$d Ë 4OU õ+…f, 4OU Oì 2eÛ#ÖPä 6ð ,/•-Õ]Ä ⊮ !_äfv[Ö-Õ‹Position Lag Œ _äfv[Ö-ÕfvG'_·"•` .•(…"‡#ÖPä 6ð ,/•(…"‡ ÛRÌYhf7" ;K-Õ]Ä •#Ö[ê5[_[Fk[¥+•#¢F¸Fò_äfv[Ö-Õ •.][¥+•_äfv[Ö-Õ_®) 5ÝFk"• C ÛRÌ !VA2Æ_[" +…f, 4OUK0 u$d Ë 4OU • ô 6ð_äfv[Ö-Õ Û

Fß!Z#©5W[Û5õ)i ò •

- z 4OU#< 4 • 4OU#< 4 !E 2 #< 4 Û
- z _äfv[Ö-Õ[¥+•

[¥+•	[¥+• #	0ö 0
Position lag supervision	deactivated	ô8§7Ì_äfv[Ö-Õ
	disable drive	_äfv[Ö-Õ]l!á[¥+•7hf75Ý •_[servo off Û
	do quick stop	_äfv[Ö-Õ]l!á[¥+•7hf75Ý •_[quick stop Û
	stay enabled	_äfv[Ö-Õ]l!á[¥+•7hf75Ý •_[NÛ2è servo on Û
Lag limit ‹E 2 #< 4 Œ	LREAL	#Ö+ [ŸFk[Ö-Õ7hf7

fK m deactivated (ý!]+j [¥+• ò]l!á[Ö-Õ7hf75Ý •_[`ä 2Œe
SMC_ERROR.SMC_DI_POSITIONLAGERROR Û

z _V Ý7hf7

Z|*X	Z|*X ú	/Í
Software limits Activated	Checked / Unchecked	6 $ $ "•_V7hf7
Negative ‹E 2 #< 4 Œ	LREAL	#´5 #øFk_V7hf7
Positive ‹E 2 #< 4 Œ	LREAL	;J5 #øFk_V7hf7

z _·"•2î ËFk 4OU3¶_×

_·"•"†Pä'>]Æ 4OUFß!ZFk_z!L#¿a¶6ð I´ ô#óFk3¶_× • fE 5Ýhb<Ï0ö •

h`FÕ	0ö 0
Position	FÕ7î 4OU ‹NÄ+à 4OU Œ
Distance	lâ"•]ÄI¢ ‹Fß+à 4OU Œ

z 4OUFkF¸3Ž

RÌfçY©+Æ 4OU#¿"ý •#Ödo+à_[#¿a¶ ‹5W3ULb'rAXIS_REF_SM3 ŒFk ò_× #¿a¶ AF¸3Ž •

#¿a¶#ôI×	4OULb'r	5W3ULb'r
.fSetPosition	$d Ë 4OU	LREAL
.fActPosition	+…f, 4OU	LREAL

7

7.7.5.2 ^Ý-d#; ¢

_[_·"• Fk` .•#ÖN-!í ! Ì ò sl´Lb'r Û

4OULb'r	+• 0
$d Ë` .•	_·"•"†Pä'>_z!áE Ì3Ž" _[Fk` .•
+…f,` .•	8 3U !6ôjX"•&O' #ë5ÝeÛ@ #´ioFk+…f, 4OUK~!áFk` .•*

*<Ï •RÌ !VA2Æ_[•&Ç5Ç !6ôjX"•&O" +…f, 4OUFÛ3ŒE $d Ë 4OU(R!L

Fß!Z#©5W[Û5õ)i ò •

z ` .•#< 4 •` .•#< 4 •E 2 #< 4/ I¹ Û

z ` .•6ÙN¦Lb'r

[¥+•	[¥+• #	0ö 0
Velocity ramp type	Trapezoid	` .•6ÙN¦ !8–/I ‹;¶ N¦;œFk"‡` .•`ä6 . 5W Œ
	Sin²	` .•6ÙN¦ ! sin² !ä.ö ‹&á+•Fk"‡` .•6ÙN¦ Œ
	Quadratic	"‡` .•6ÙN¦ !8–/I ‹"‡` .•X'"‡` .•Fk#¿"ýCn ‹]ª.• Œf7" Œ` .• 6ÙN¦
	Quadratic ‹smooth Œ	#óQuadratic -"‡` .•Fk#¿"ýCn ‹]ª.• Œ6ÙN¦ !_ÅNÔFk` .•6ÙN¦

z _·"•2î ËFk` .•3¶_×

_·"•"†Pä'>]Æ` .•Fß!ZFk_z!L#¿a¶)i ò •

h`FÕ	0ö 0
Velocity	FÕ7î` .• *

*<Ï •RÌ&Ç !]Ö/kef.• ô]š1ý"‡` .• Ú"‡` .•Fk#¿"ýCn ‹]ª.• Œ_®+öK0&ÇM • +ãQÛ_·"• 5Ç<¼_¥" FÕ7î` .• Û

z ` .•FkF¸3Ž

)ifçY©+Æ` .•#¿"ý •#Ödo+à_[#¿a¶ ‹5W3ULb'r ! AXIS_REF_SM3 ŒFk ò_× #¿a¶ AF¸3Ž •

#¿a¶#ôI×	4OULb'r	5W3ULb'r
.fSetVelocity	$d Ë` .•	LREAL
.fActVelocity	+…f,` .•	LREAL

7.7.5.3 !^^Ý-d Ì •^Ý-d#; ¢

_[_·"• Fk"‡` .•#ÖN-!í ! Ì ò2 I´Lb'r Û

4OULb'r	+• 0
$d Ë"‡` .•	_·"•"†Pä'>_z!áE Ì3Ž" _[Fk"‡` .•
+…f,"‡` .•	8 3U+…f,` .•K~!áFk"‡` .•

Fß!Z#©5W[Û5õ)i ò •

z "‡` .•#< 4 •"‡` .•#< 4 !E 2 #< 4 /I¹ ² Û

z "‡` .•6ÙN¦Lb'r •[Þ#©Oê7 22!sK 7.7.5.2 Ri Û

z _·"•2î ËFk"‡` .•3¶_×

_·"•"†Pä'>]Æ"‡` .• /!¶` .•Fß!ZFk_z!L#¿a¶)i ò •

h`FÕ	0ö 0
Acceleration	FÕ7î"‡` .•*
Deceleration	FÕ7î!¶` .•*

*<Ï •

#ÖPä&Ç !]Ö/kef.• ô]š •"‡` .•Fk#¿"ýCn ‹]ª.• Œ_®+öK0&ÇM •+ãQÛ_·"• 5Ç<¼_¥" FÕ7î"‡` .• ÚFÕ7î!¶ ` .• Û

"‡` .• õ!¶` .•Fk)>E 7î!- ! •/:FÕ"4` .•FkNÄ+à #fçYh#¿+ö5Ý • )>E Deceleration ž/:FÕ"4` .•FkNÄ+à #fç Yh#¿) 5Ý •)>E Acceleration Û

% r7L[Û •RÌ_[FÕ"4` .• ! 500 •2NX3_·"•2î Ë !#´#ø_·"• ‹ Velocity = 1000 •Acceleration = 1200 • Deceleration = 600 Œ •" ` .•6ÙN¦ õ"‡` .•6ÙN¦)i ò2'I! •

z "‡` .•FkF¸3Ž

)ifçY©+Æ"‡` .•#¿"ý •#Ödo+à_[#¿a¶ ‹5W3ULb'r ! AXIS_REF_SM3 ŒFk ò_× #¿a¶ AF¸3Ž •

#¿a¶#ôI×	4OULb'r	5W3ULb'r
.fSetAcceleration	$d Ë"‡` .•	LREAL
.fActAcceleration	+…f,"‡` .•	LREAL

7.7.5.4 !^^Ý-dEB"–!ÔBEoÑ\•-doÒ#; ¢

]ª.•2î+•"‡` .• /!¶` .•Fk#¿"ý;»Cn Û2î+•"‡` .•Fk#¿"ýCn ‹]ª.• Œ#õ •` .•6ÙN¦ ! S 'r ‹"‡!¶` 6ÙN¦ !_ù (…_ù!¶ •5Ç"‡` .•Fk#¿"ýCn ‹]ª.• Œ Œ •#Ö!¶+ö7!8—!™!â Û_[_·"• Fk"‡` .•#ÖN-!í ! Ì ò 2 I´Lb'r •

4OULb'r	+• 0
$d Ë"‡` .•Fk#¿"ýCn ‹]ª.• Œ	_·"•"†Pä'>_z!áE Ì3Ž" _[Fk"‡` .•Fk#¿"ýCn ‹]ª.• Œ
+…f,"‡` .•Fk#¿"ýCn ‹]ª.• Œ	8 3U+…f,"‡` .•K~!áFk"‡` .•Fk#¿"ýCn ‹]ª.• Œ

Fß!Z#©5W[Û5õ)i ò •

z "‡` .•Fk#¿"ýCn ‹]ª.• Œ#< 4 •]ª.•#< 4 !E 2 #< 4/ I¹ ³ Û

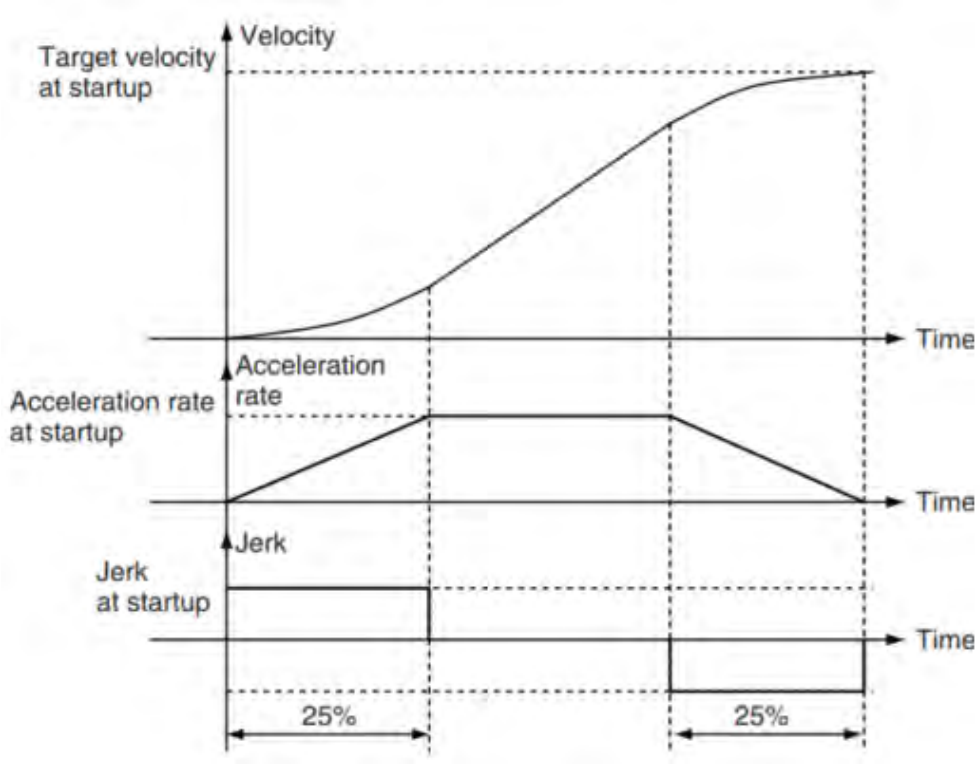
z "‡` .•Fk#¿"ýCn ‹]ª.• Œ6ÙN¦Lb'r •[Þ#©Oê7 22!sK 7.7.5.2 Ri Û

z _·"•2î ËFk"‡` .•Fk#¿"ýCn ‹]ª.• Œ3¶_×

_·"•"†Pä'>]Æ]ª.•Fß!ZFk_z!L#¿a¶)i ò •

h`FÕ	0ö 0
Jerk	FÕ7î"‡` .•Fk#¿"ýCn ‹]ª.• Œ *

*<Ï •/: Velocity ramp type !Trapezoid1ý Sin²5ÝJerk[¥+• # ô +à_·"•]^ CE ž/: Velocity ramp type ! Quadratic1ýQuadratic smooth5ÝJerk5W #[¥+•24 /X$´` .•6ÙN¦Y«!ù Û



z "‡` .•Fk#¿"ýCn ‹]ª.• ŒFkF¸3Ž

)ifçY©+Æ"‡` .•Fk#¿"ýCn ‹]ª.• Œ#¿"ý •#Ödo+à_[#¿a¶ ‹5W3ULb'r !AXIS_REF_SM3 ŒFk ò_× #¿a¶ A F¸3Ž •

#¿a¶#ôI×	4OULb'r	5W3ULb'r
.fSetJerk	$d Ë"‡` .•Fk#¿"ýCn ‹]ª.• Œ	LREAL
.fActJerk	+…f,"‡` .•Fk#¿"ýCn ‹]ª.• Œ	LREAL

7.7.5.5 ^24w"Ï

' ò_×0¬/I5Ý •_·"•fç2î+•4´ C5 #ø •

z _[CK0` _·"•5Ý_z!L 2 Velocity !NÄ+à # •5 #øfçE Direction 7L2î+• Û

z _[[¥+• !5²_S_[5Ý •/g;J#´ 5 #ø_·"•Fm#ÖIâ"•QÚFÕ7î 4OU •&Ç;Kfç2î+•_·"•5 #ø Û

_·"•"†Pä'>]Æ5 #øFß!ZFk_z!L#¿a¶)i ò •

g7E¬	Z|*X ú	/Í
Direction	negative	/g#´5 #ø_·"•
	shortest	/g6çGÔ]Ö/k5 #ø_·"• ‹#Ñ+à5²_S_[E 5/ Œ
	positive	/g;J5 #ø_·"•
	current	„ANFÕ"4_·"•5 #ø_·"• ‹#Ñ+à5²_S_[E 5/ Œ
	fastest	/g] 5Ý6çGÔFk]Ö/k5 #ø_·"• ‹#Ñ+à5²_S_[E 5/ Œ *

*<Ï •

shortest ‹Iâ"•ef.•6çGÔ Œ õfastest ‹Iâ"•5ÝeÛ6çGÔ Œ9i/ÜFß # - ô+s!OFßK0 •#Ö#©Oê ò_× r+7 •

z [¥+• •

[¥+•_[!5²_S_[•Rê&Û !360 Û

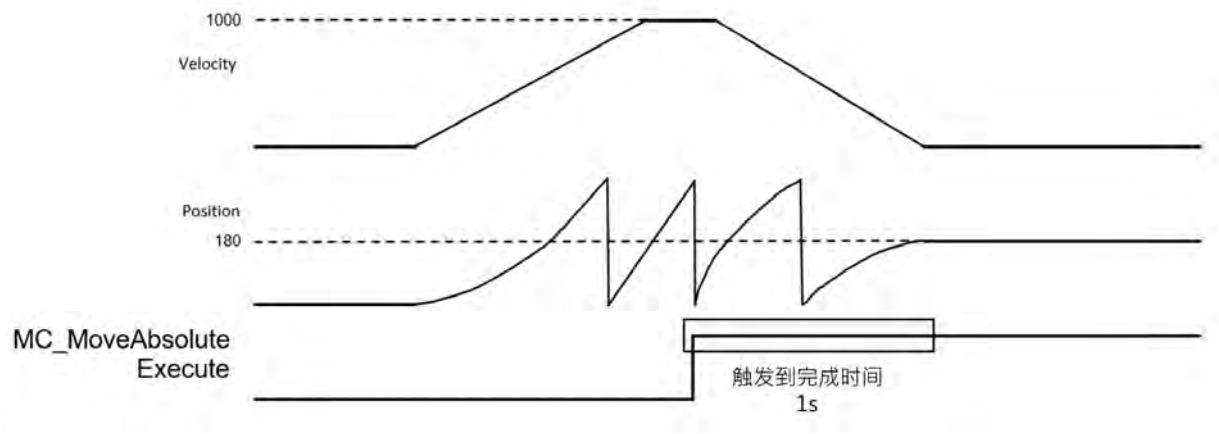
!5 ¦Y©+Æ •[¥+•_[Fk Velocity ramp type !Trapezoid Û

z 4´ C;Lj‹ •

fE MC_MoveVelocity _ÂX3K0` _·"• ‹Velocity = 1000 Œ

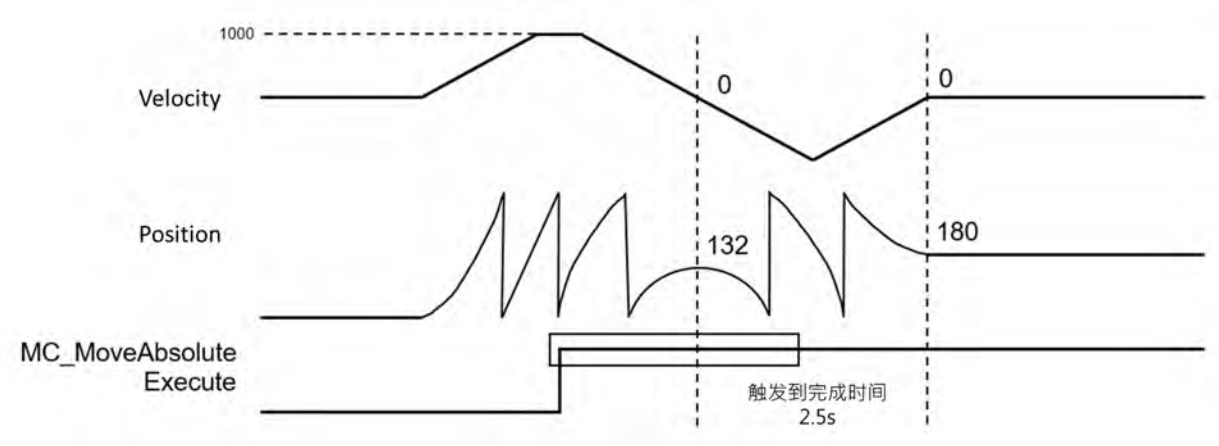
/:E 7!]W" 350 •.] û` .•" _¥ 1000 5Ý •#ó8 0¬!œ ò2NX3 ; ô#ó5 #ø[¥+•Fk MC_MoveAbsolute •2N X3

MC_MoveAbsolute ‹ Position = 180 •Velocity = Acceleration = Deceleration = 1000 • Direction = fatest Œ



MC_MoveAbsolute.Execute YÍ#¸5ÝLâNÆ" 5"" _¥ 4OU180 Fk] 5Ý6çGÔFk5 #ø6 <¦G';J5 #ø!¶` QÚ 0Ô Oþ5ÝN‹ I¹ Û

2NX3MC_MoveAbsolute ‹ Position = 180 •Velocity = Acceleration = Deceleration = 1000 •Direction = shortest Œ Û



MC_MoveAbsolute.Execute YÍ#¸5ÝLâNÆ" 5"" _¥ 4OU180 Fk6çGÔ]Ö/k6 <¦G'#´5 #ø]W‹350 – 180 = 170Œ -E u_®Iò hb[•` .•#´_S •#´Oó) _S m!Ç&ï Û_®IòOþ5ÝN• 2.5 I¹ Û

7.7.6 ^2M,2e ô

ç_[Ì ñ#Z#ÖN«1÷_[N«_·"• •.]` _® DIADesigner-AX [¥+•_[N« ÛFÛN¦_[6ç) 5 2è!T_[•5²_S_[5 2è ð_[ûh„(ý ð_[#Ö C !]Æfv_[Û

7.7.6.1 ^2M,E²M}2•W#

TransitionMode •_[N«_·"•_ÂX3_®Iò •5 #¿3¹XL_O_àFk5 #ø#ÖPä 7!#× ŽE fî"•(×$´B•!œ Û#Ö" E _[N«_·"•3Ž" 2î ËFk_z!L.üQ #¿a¶ TransitionMode ‹_®.•: .ö Œ2î ËeÛFk_Å3Œ"• C5 <¼ Ì!¶+ö ñ_×fî"•(×$´B•!œ Û

z TransitionMode: .ö ²N´

: .ö	3¶_×
None	5Ç5/7ƒ ‹n¿[‹ Œ
Overlap	K ç;œ!¶` .•a´_ÔK s;œ"‡` .•_ÂX33ŒNÔ

z TransitionMode: .ö5 2è3ŒNÔ ²N´

: .ö	Aborting	Buffered	Blending Low	Blending Previous	Blending Next	Blending High
None	A	A	N	N	N	N
Overlap	A	A	D	D	D	D

A = 5 2è

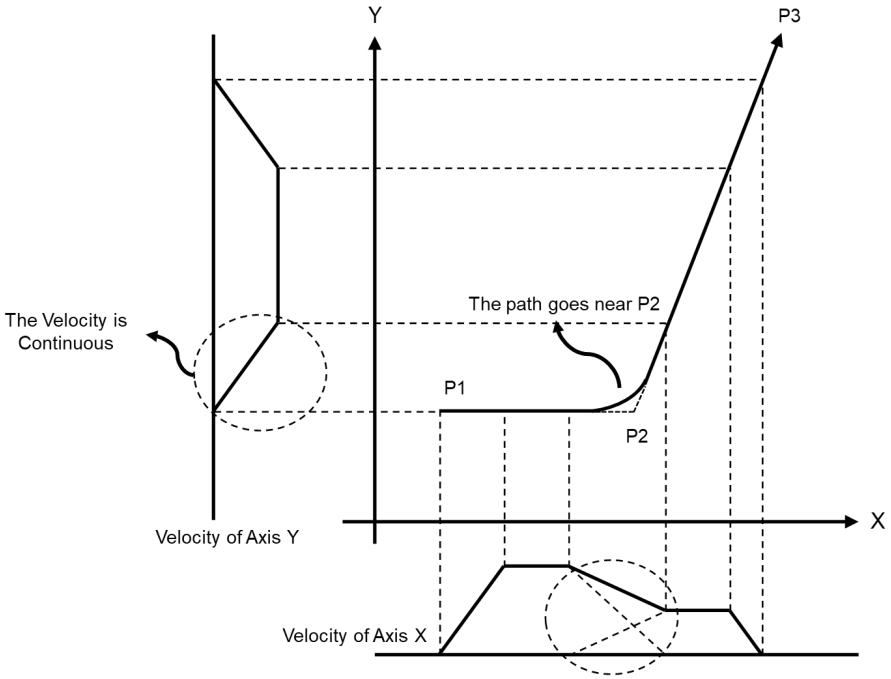
N = ô5 2è

D = Blending 5 .ö3ŒNÔ

z TransitionMode •[¥+•None ÚOverlap3ŒNÔ_ðBuffered ! ò!þ5 .ö

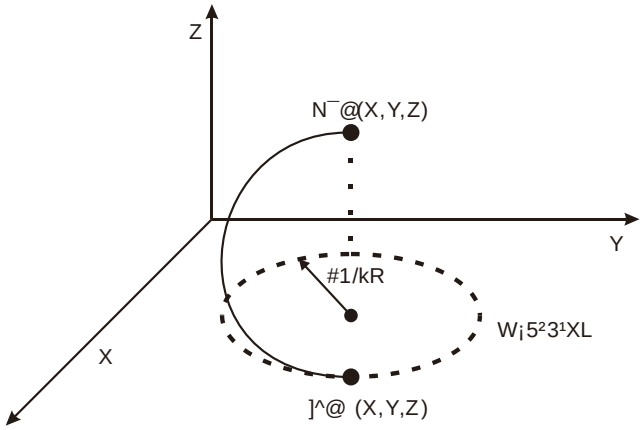
z TransitionMode •[¥+•Overlap3ŒNÔ_ð2BBlending ! ò!þ5 .ö Û

!í" #©Oê#ë_[N«Iâ"•"†Pä'>Fk!¶` .• õ"‡` .• AY«!ù



7.7.6.2 ^2M,Vx4‰2•W#

W¡5²3¹XL5 2è3 _[•' ðNÛJaeÛ2NX3 X,Y,Z _[õ#Í(ý ð_[]Æfv_[Û

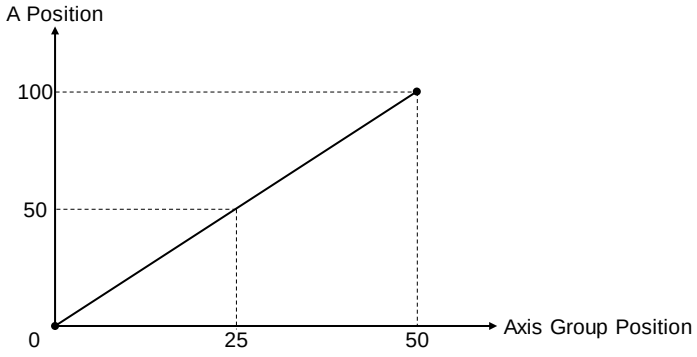


z _[N«_äfv_[9i/Ü ²N´

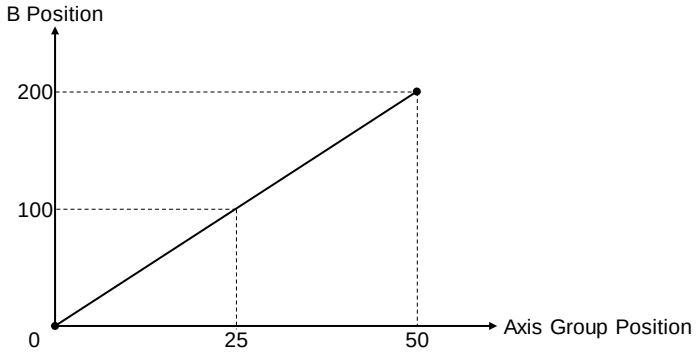
/:N«#ï_[‹X • Y •Z Œ' _·"•_®Iò _äfv_[‹A •B •C Œ ÌK0;» rFk5 .ö#ó;L_·"• Û

[N«Iâ"• µ 4OU 0 .ç)²Iâ"• •!í" !N«#ï[Iâ"• 4OU ‹ 30 •40 •0 Œ•N«#ï_[Fk#ï1÷]ÄI¢ ! ‹ 50 Œ•_äfv_[Iâ"• 4OU ‹100 •200 • 300 Œ•' N«#ï_[_·"•_®Iò õ_äfv_[Fk#ó;L_·"•)i ò&åI! •

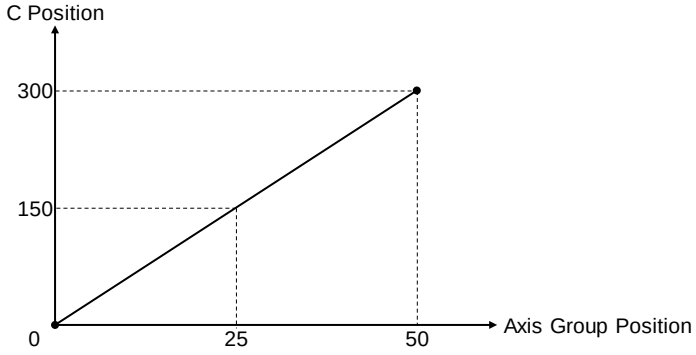
„ A _[_äfv



„ B _[_äfv



„ C _[_äfv



<Ï •/:N«#ï_[<^6ðlâ"•5Ý •_[N«"†Pä'>_z!L` .• fE u •_äfv_[_j6çef]ÄI¢Fk_[•!]+j_äfv_[„]ÄI¢;» r]Æ
fv#ó;L_·"• Û

7.7.6.3 ^2M,#; ¢ :

_[N« C;I "Yh6ð!í !Iò.v C;I õ.é. C;IFk5 .ö •;K I´5 .ö C;I5 <¼ ôFß#ó •

z Iò.v C;I

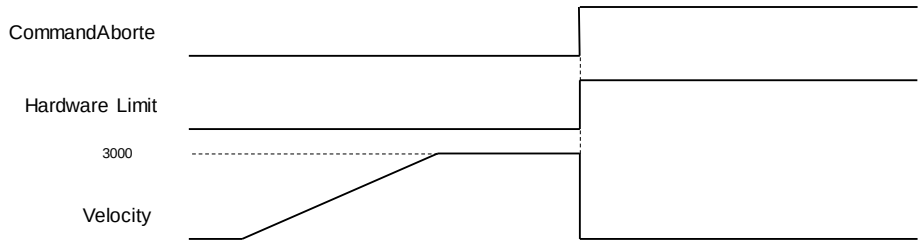
' Iò.v fE DMC_GroupStop+í_·"•_[_[N«!¶` C;I' /: ò 4OU•[N«B•/è !î3IQÚ GroupStopping • ' ;KB•/è5Ç<¼2NX3 â <_[N«2î Ë_·"• Û

lrDeceleration .üQ fçYh_z!L5W # •[¥+•!¶` C;I` .• Û

z .é. C;I

/:_[N«_·"•5Ý`.e [Ö#õ • Ì0 CFk5 .ö C;I_·_S Û

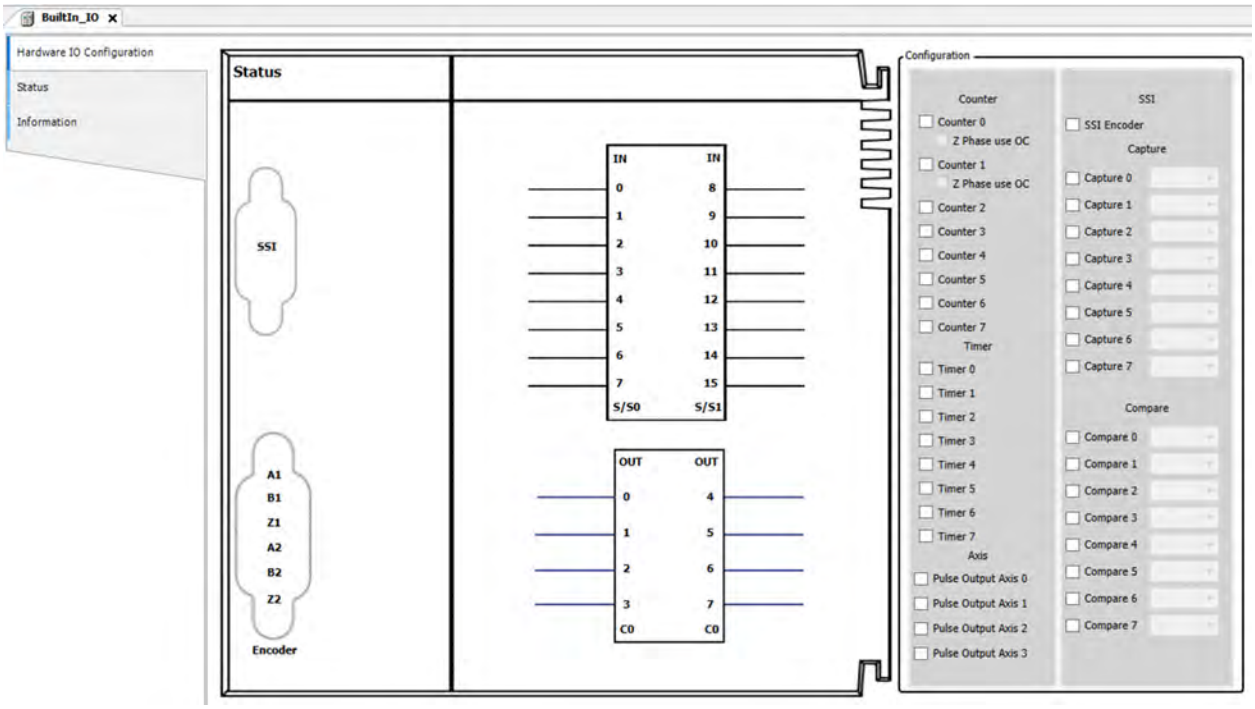
r)i •/:_[N«_·_S5Ý`." HS Ý7hf7 ‹ Hardware Limit Œ•"†Pä'> 2Œ 5”$d Ë ‹ CommandAborted Œ;K5Ý ` .• ‹ Velocity Œ Ì0 CFk5 .öf4QÚ ! 0 Û



7.7.7 5ê i–^Ý IO

7 JÇRi3¶_×AX Lâ!þ7 :Fk IO @ 4 •#Ö fE 2"†Päa4OU õ#©5W[¥+• Û

7.7.7.1 I/O !]O»` N,



' "7! ñj¿` I/O 3· , Ì ò"†Pä[¥+• •

z DIO •#Ö[¥+• 5” Ú>Ë<É Ú7h0 K0"†Pä •N-`Ï[Û5õ#©OêK 7.7.7.2 Ri Û

z SSI Encode •#Ö[¥+• SSI FkNýGèLb'rÚ5Ýd†hxCn ÚSS₺W3Uef.•K0"†Pä •N-`Ï[Û5õ#©OêK7.7.7.3 Ri Û

z Pulse Encoder •#Ö[¥+•j¿` [ˆ5W&OFk#¿a¶ õ[ˆ5W: .ö Ì#± Z Fß È#Þ6 $ $ E K0"†Pä1ý6 j¿` +•5Ý&O#¿a¶ +Š$1 •N-`Ï[Û5õ#©OêK 7.7.7.4 Ri Û

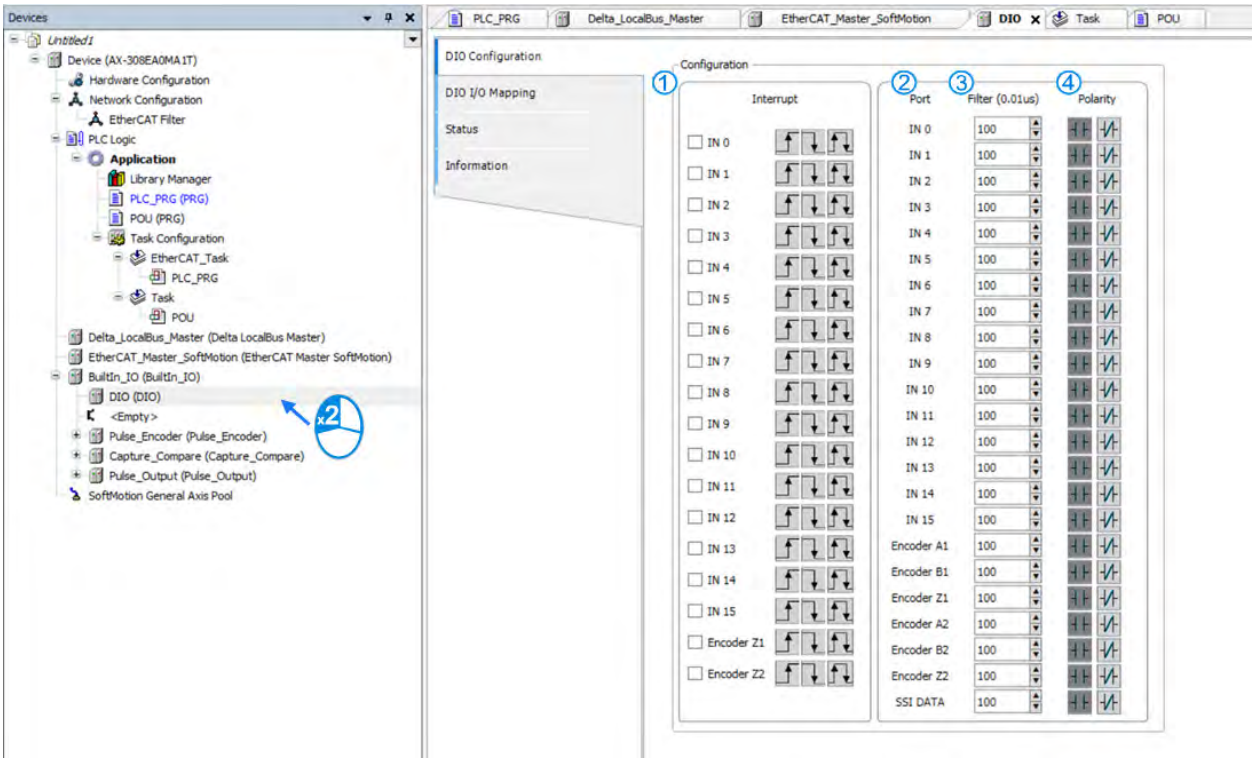
z Capture / Compare •#Ö+Š$ɟ¿` 3<30&O1ýj¿` ;»_j&OFk#¿a¶ •N-`Ï[Û5õ#©OêK 7.7.7.5 Ri Û

z Pulse Output •#Ö[¥+•Pð!™_z!áFk: .ö Ú5 #ø Ì#±#†@ &Å/9Fk: .ö õ#©5WK0"†Pä •N-`Ï[Û5õ#©OêK7.7.7.6 Ri Û

7.7.7.2 DIO !]O»Z|*X

;KJÇRi3¶_×DIO X¬OU •[¥+• "7! I/O @ 4Fk 5” Ú>Ë<É Ú7h0 K0"†Pä Û

#<!â DIO ò#Ö_Â!L[¥+•E"gI Û

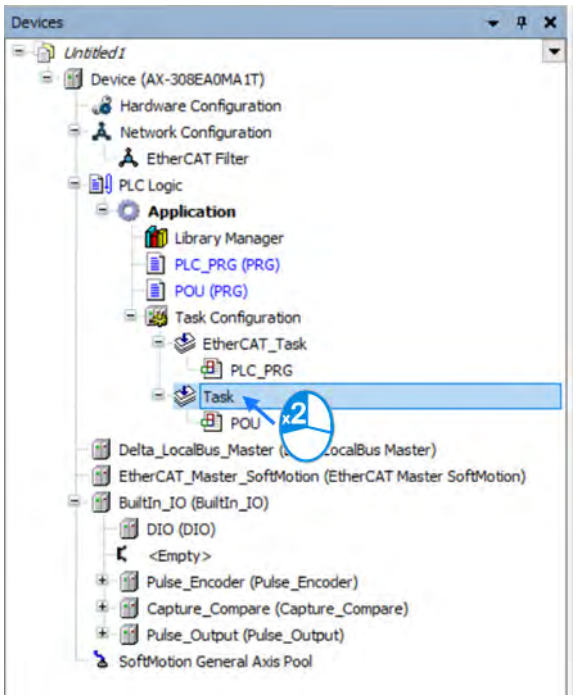


z Configuration

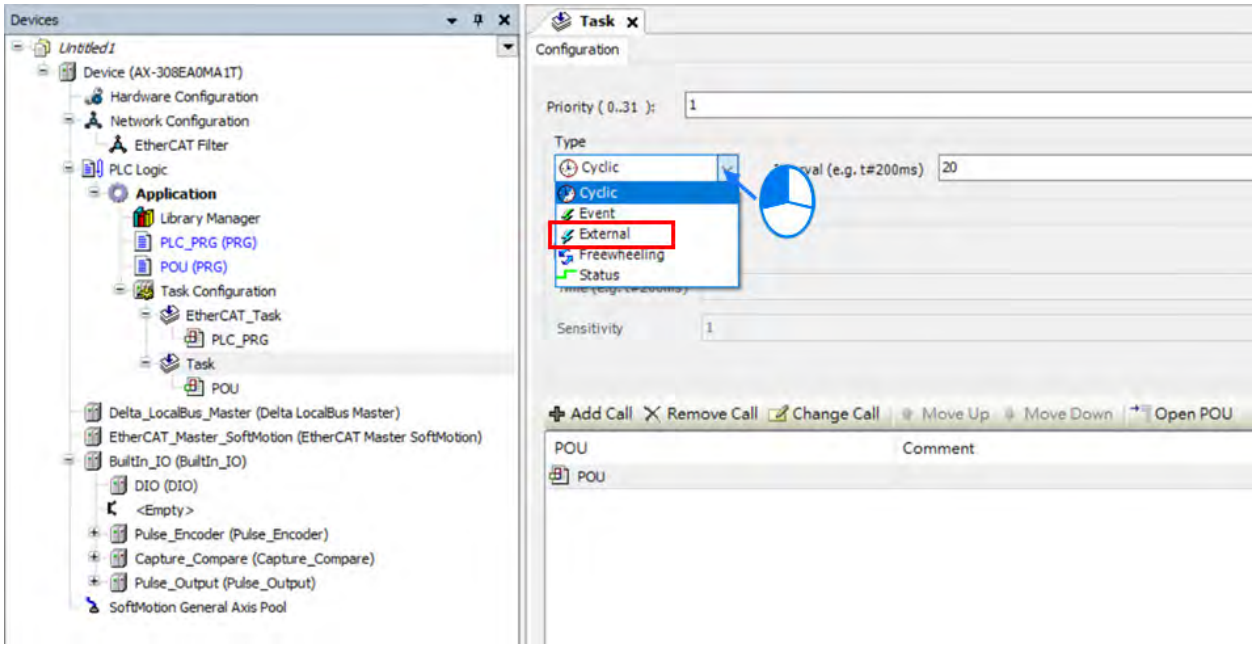
!]O»	Z²4Ì
c (ý`Ï 5”[¥+•	n¿[‹ #
	$ "•(ý`Ï 5”
	/:$ "•(ý`Ï 5” •[¥+•_z!L3Œ@ ! ñ/•!í È#Þ
	/:$ "•(ý`Ï 5” •[¥+•_z!L3Œ@ ! ò/•!í È#Þ
	/:$ "•(ý`Ï 5” •[¥+•_z!L3Œ@ ! ñ ò/•!í È#Þ
d Port	+à.{(ý`Ï3Œ@ Ný#Þ
e Filter	100 [¥+•>Ë<É5ÝeÛ ‰Œ¥+ Rê&Û ! ‹0~100000000 Œ•n¿[‹6 100us
f Polarity	[¥+•_z!L3Œ@ 7h0 •n¿[‹ # ! A 3Œ@
	[¥+•_z!L3Œ@ 7h0 ! B 3Œ@

z I/O 5” fE 5 <¼ •

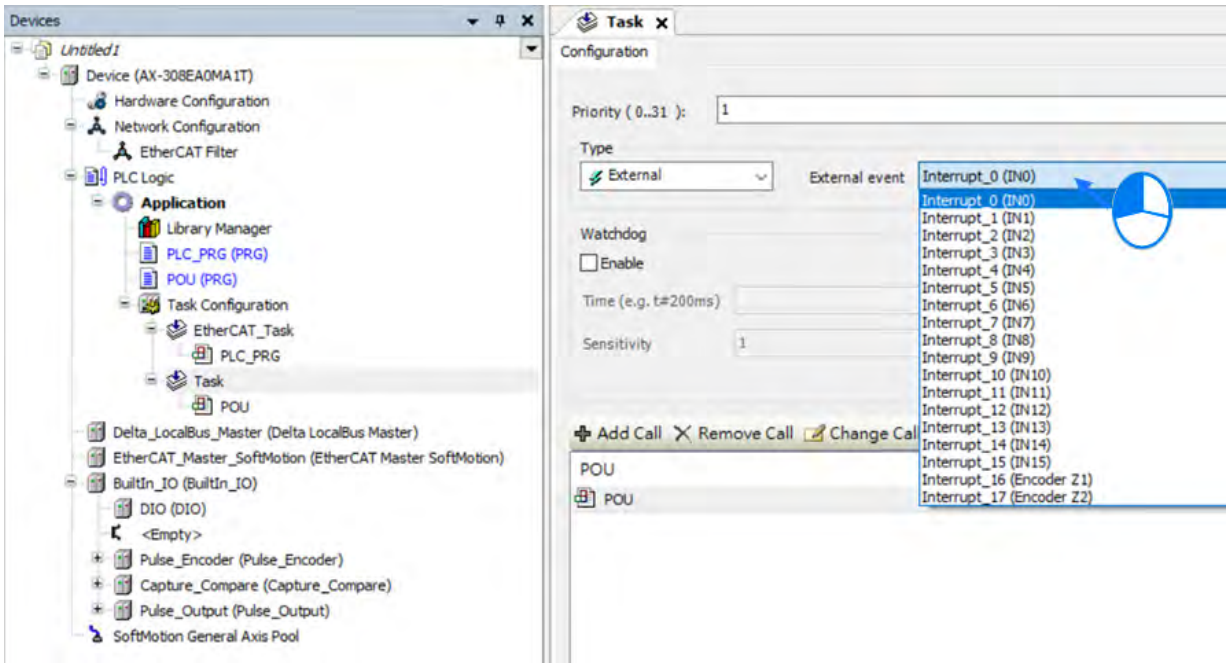
„ ' DIO [¥+•E"gI$ "• 5””†Pä#õ •#<!â fç 5””†PäFk Task Û



„ _Â!L Task [¥+•E"gI •#<!â Type #õ_ð2ÐExternal Û

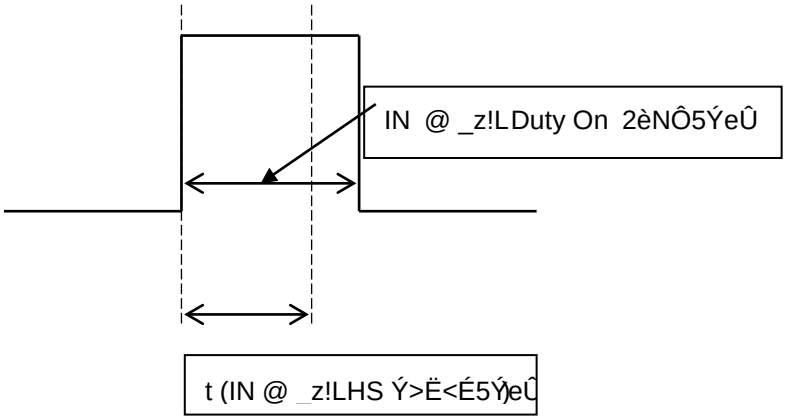


„ /:_ð2Ð External #õ •#<!â External event ' _ð2Ð+à.{ 5”3Œ@ Û



z HS Ý>Ë<É5ÝeÛ[¥+• # !+ö uN @ _z!LDuty On Fk5ÝeÛ •)i ò&å2'I! •

„ HS Ý>Ë<É_z!LRê&Û1~50000000 •#< 4 ! 0.1us Û



„ >Ë<ÉhxCn õ5ÝeÛ!ZLâ)i ò •

>Ë<ÉhxCn ‹Hz Œ•>Ë<ÉhxCn= 1 / ‹2 * t ŒŽt !>Ë<É5ÝeÛ[¥+• # ‹#< 4 Œ

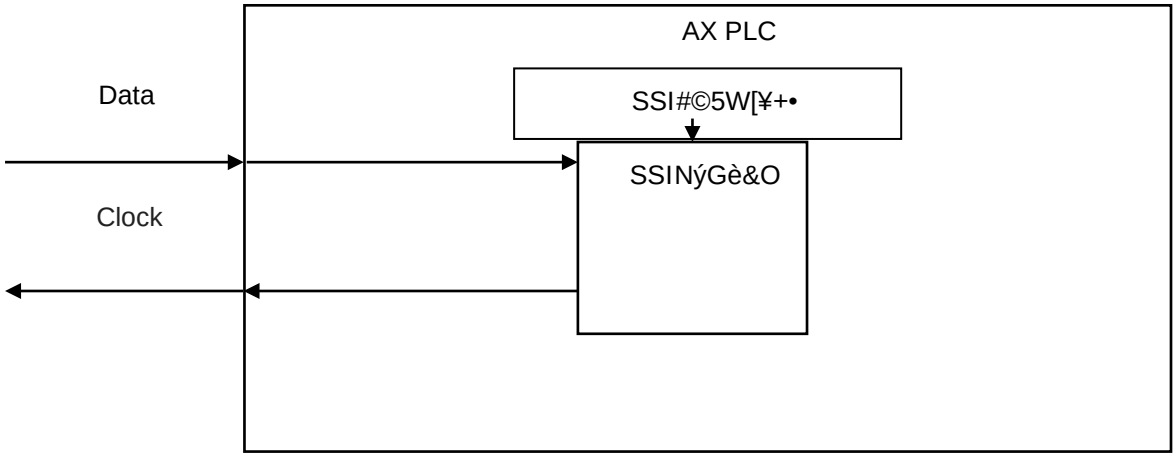
/:_z!LhxCnj¿ u;K>Ë<ÉhxCnRê&Û 2 È#ó X'>ËfK Û

;K"†Pädo+àDFB_Capture ÚDFB_Hcnt ÚDFB_HTmr ÚDFB_Compare Ì#±7 : IO 5”K06ð" Fk IN _z!L@ Û

7.7.7.3 SSI MÔF¿%&!]O»Z|*X

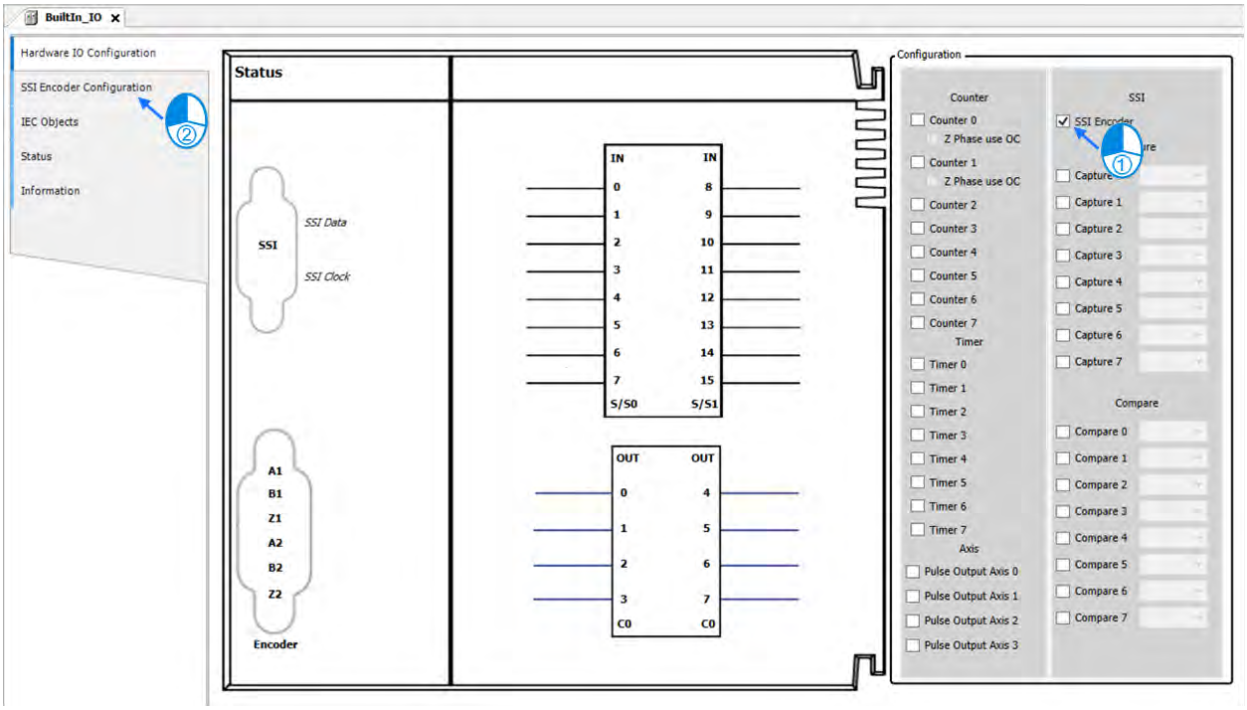
AX 3Ž" &O7 : IO JÖ ñ5 2è çN« SSI NýGè&O"†Pä •` _®D-SUB 3Œ#Ê ðPLC _Å3Œ •;K3Œ#Ê3· 5V E >w_z !á Ì ,NýGè&OE >w •E 2 fç"å_ð SSI NýGè&O"†Pä$ E .][¥+•)d[ÌNýGè&O2'fçYhFk#©5W •` _®HS Ýa4OU` `:#Z#Ö 3Œ5 NýGè&OFk5W3U Û

z SSI NýGè&O7•7k

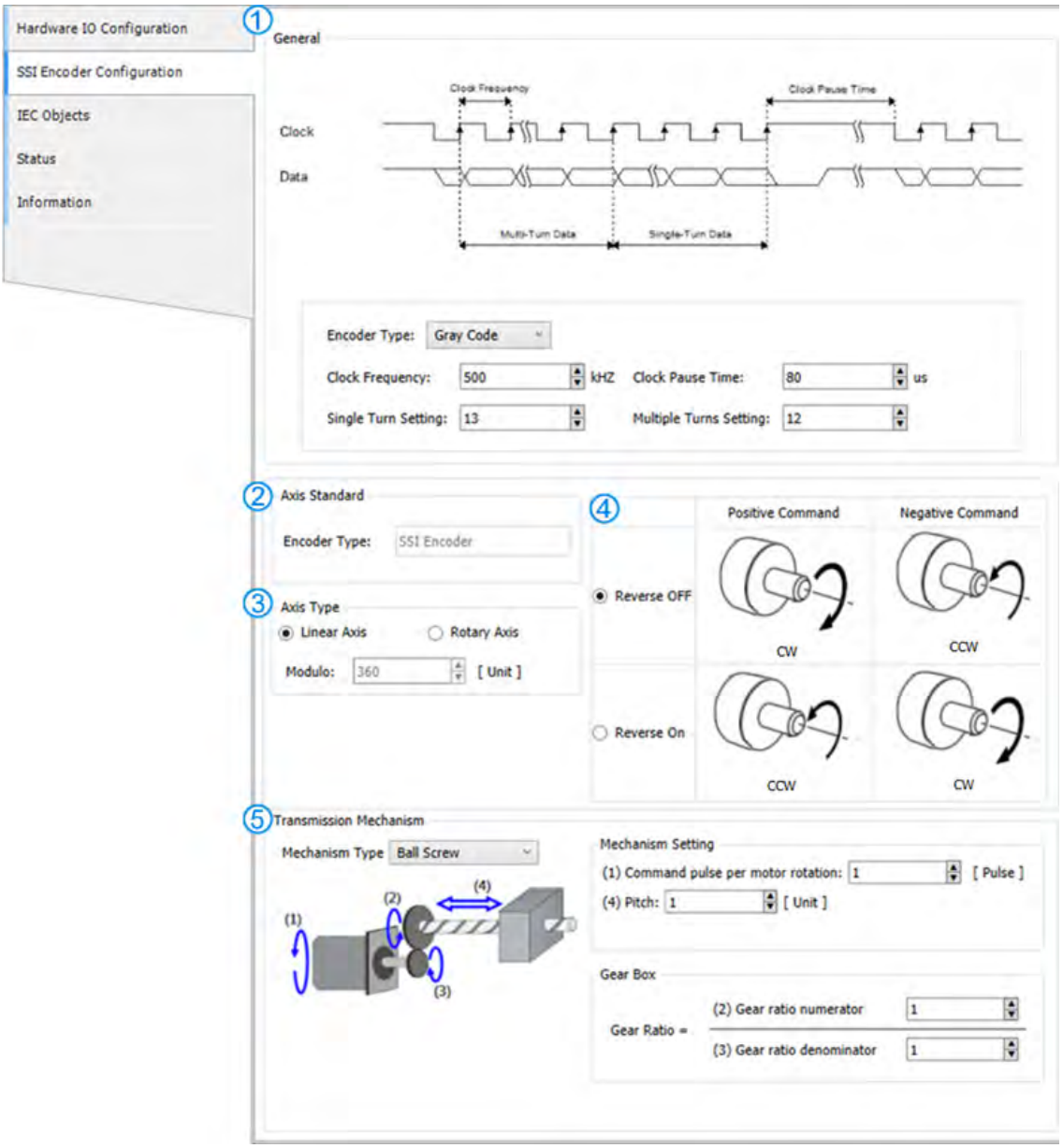


z SSI NýGè&O"†Pä$ "•

„ ' BuiltIn_IO E"gI •#<!â SSI Encoder #õ!t#<!â SSI Encoder Configuration Û



„ ' SSI Encoder Configuration E"gI #Ö[¥+• SSI FkFß!Z[¥+• • Ì òdo+à[¥+•[Û5õ •



„ c General

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Encoder Type	SSI NýGè&OLb'r	Gray code / Binary code ‹Gray code Œ
Clock Frequency	E u SSI NýGè&O` [–Fk _z5Ýd† È#ÞFkhxCn ‹fç Yh Ì SSI NýGè&O5W3UXO C !#©Oê Œ	‹500 Œ
Single Turn Setting	#<&ï5W3UFk5W3Uef.• ‹fçYh Ì SSI NýGè&O5W3UXO C !#©Oê Œ	‹13 Œ
Multiple Turns Setting	) &ï5W3UFk5W3Uef.• ‹fçYh Ì SSI NýGè&O5W3UXO C !#©Oê Œ	‹ 12 Œ
Clock Pause Time	' 5Ýd†Fk6ç#õ ç òf4Nÿ 2#õ •5W3UN¦+í Ä2è 5 E .Z ç;œ5ÝeÛ •FÛ" 5W3UN¦2°j¿ ‹fçYh Ì SSI NýGè&O5W3UXO C !#©Oê Œ	‹ 80 Œ

„ d Axis Standard

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Encoder Type	NýGè&OLb'r6%I!	-

„ e Axis Type

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Linear Axis ’Rotary Axis	[¥+•FÛN¦_[1ý5²_S_[	Linear Axis Rotary Axis ‹Linear Axis Œ
Modulo	/:_ð2Ð5²_S_[#õ#Ö[¥+•5²_S_[+à) Rê&Û #	‹360 Œ

„ f Positive ’ Negative Command

"ËH®	!]O»
Reverse OFF ’ON	[¥+•;J#´#ø$d Ë

„ g Transmission Mechanism

do+à ô#ó7•7k Ì ò!þ ²N´ •

‹ Ball Screw

"ËH®	!]O»
‹1 ŒCommand Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
‹4 ŒPitch	W¡7-eÛ]Ä
‹2 ŒGear ratio numerator	E +7of_U;»!í+7
‹3 ŒGear ratio denominator	E +7of_U;»!í;´

‹ Round Table

"ËH®	!]O»
‹1 ŒCommand Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
‹4 ŒMovement distance per motor rotation	E 7!;¶_SFkIâ"•]ÄI¢
‹2 ŒGear ratio numerator	E +7of_U;»!í+7
‹3 ŒGear ratio denominator	E +7of_U;»!í;´

‹ Belt Pully

"ËH®	!]O»
‹1 ŒCommand Pulse per motor rotation	E 7!;¶_SFk2î ËPð!™
‹4 ŒDiameter ‹Movement distance motor rotation •Diameter *n Œ	FÛ/k ‹E 7!;¶_SIâ"•]ÄI¢ •FÛ/k *n Œ
‹2 ŒGear ratio numerator	E +7of_U;»!í+7
‹3 ŒGear ratio denominator	E +7of_U;»!í;´

z [¥+• SSI Encoder 6 ¶#¿a¶

„ SSI Encoder #Ö` _®Ì ò#©5W[â#½+…f, 4OU õFß+à.{FkErrorID Û

"ËH®	C*w
EncoderPosition	SSI +…f, 4OU
ErrorID*<Ï	SSI Encoder ` [–B•/è •B•/è)i ò • 0 •No Error 16#2501 •Error Communication 16#2502 • Wrong Parameter Setting

<Ï •

ErrorID •

/:<^6ð_Å3ŒSSI Encoder 1ý6 SSI Encoder õ CPU 5”3pP;7! ErrorID = 1 Û

/: MultiTurns + SingleTurns) u 32 •ErrorID = 2 Û

Ì ñe [ÖB•!œ f BusCycle C;I6Û5—EncoderPosition •.] û EncoderPosition NÛ2è ñ ç # •FÕFk ! RÌ Encoder 6ð/:#ó;L_·"•Fk "_[5ÝYh`f!4!]+j µ_[#¸E]Ú"• Û

ErrorID =ìfK •

/:<^6ð_Å3ŒSSI Encoder 1ý6 SSI Encoder õ CPU 5”3pP;7! Status Data = 1 • BusCycle C;I6Û5— •.] û EncoderPosition NÛ2è ñ ç # •FÕFk !RÌ Encoder 6ð/:#ó;L_·"•Fk "_[5ÝYh`f!4!]+j µ_[#¸E]Ú"• •

Ans •8§7Ì SSI Encoder õ CPU FkP;7! • Õ;J#õgÎ : HU+•P;7!` `:5Ç[Ö#õ 0I(ô BusCycle Fk EncoderPosition 6Û5— •e [Ö#†&Ç#ÖPä/o) I´ •)i • SSI Encoder 7 3¹)d Ú SSI Encoder '63p ÚDrive 7f.é. K0 Û

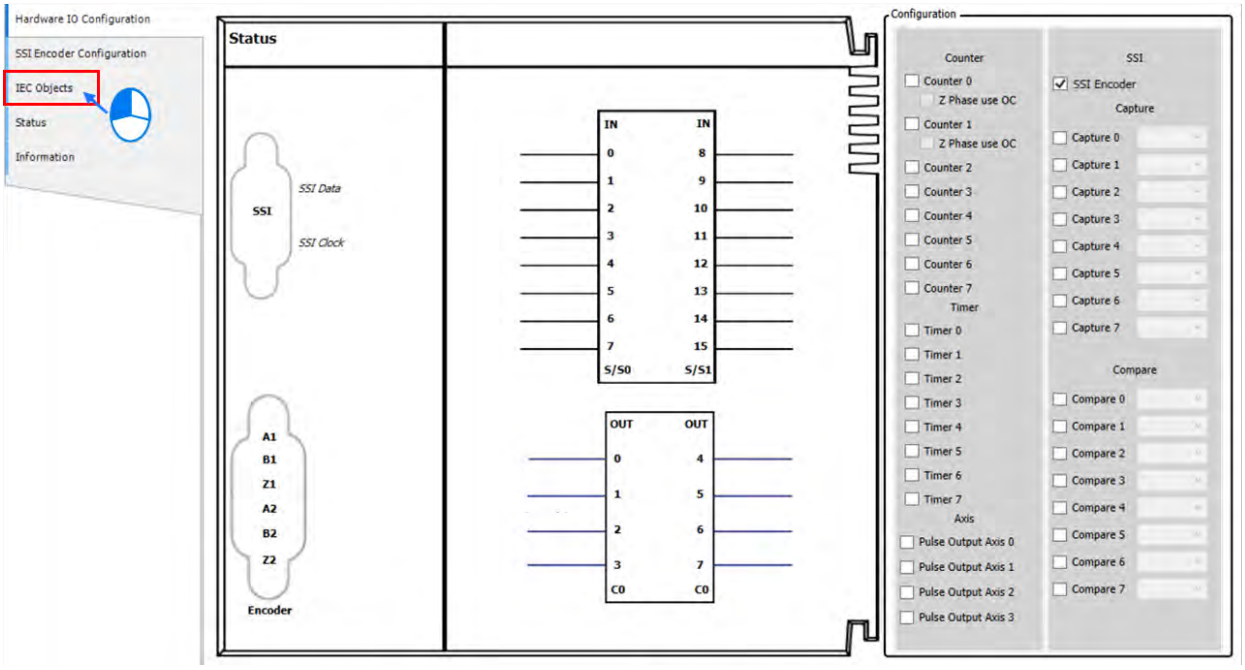
/: MultiTurns + SingleTurns) u 32 • Status Data = 2 •

Ans •+í MultiTurns + SingleTurns Fk#©5W[¥+• # ô]l_®32 #õa´5— ò_d#Z#Ö

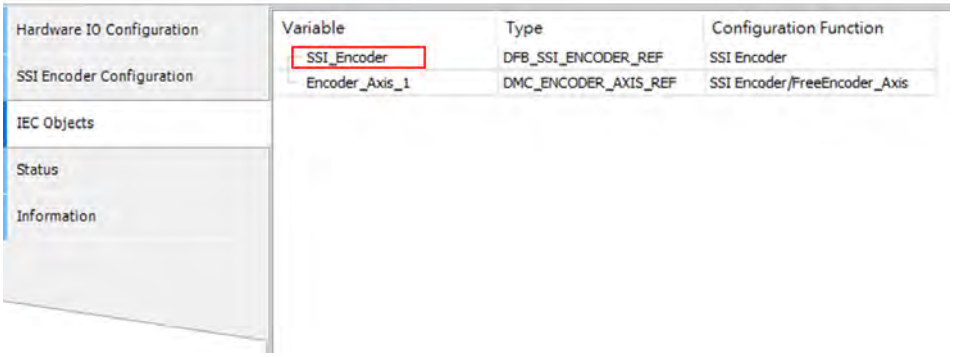
z SSI Encoder fE ' Iò.v •

SSI NýGè&OX¬OUQÑ. FkNýGè&O_[#¿a¶ •;K#¿a¶ ,E ²OU Fk_·"•"†Pä'> fE ‹ex.MC_CamIn

„ BuiltIn_IO E"gI #<!â IEC Objects



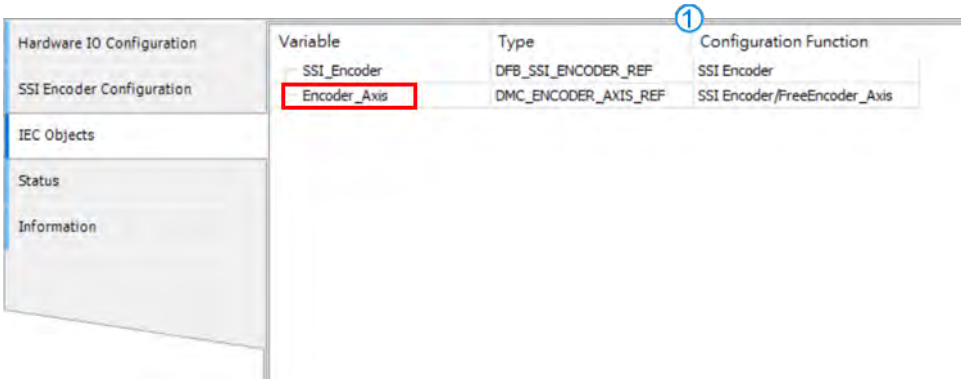
„ [â#½Rê r



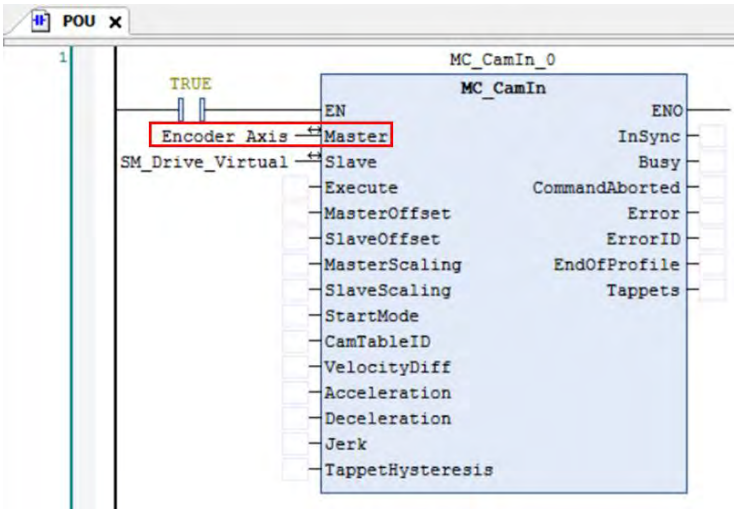
#Ö uIò.v ` _®N‰8-#¿a¶#½/~SSI NýGè&O 4OUError ID • r åSSI_Encoder. EncoderPosition æÚ

åSSI_Encoder.ErrorID æÛ

„ IEC Objects E"gI c !a4OU"†Pä ²N´ •do+à POU fE Fk_[#ôI×fç(R Encoder_Axis Û



„ ' POU do+à MC_CamIn "†Pä'> • "_[7L>w#Ö fE SSI /:7L>w •_z!LFk_[#ôI× ! Encoder_Axis Û

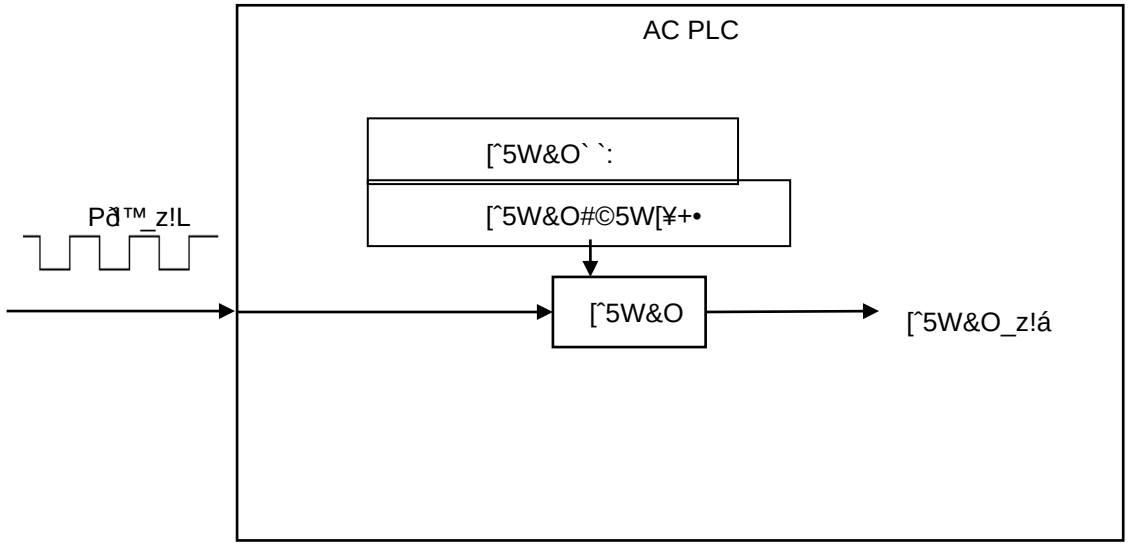


7.7.7.4 Pulse Enc o d er !]O»Z|*X

AX Lâ!þ õ Pð!™fNýGè&O_Å3Œ5 .ö5 2è-Õ"•_z!L⁄2 N« ŒÈ#±.çf-7h_z!L‹ 6 N« ŒƁŒ#ŒÊ"•3Œ#Ê _® D-SUB15 3Œ#Ê ðPLC _Å3Œ •;K3Œ#Ê€ðN«j¿` [ˆ5W ‹[ˆ5Ý Œ&O#Ö Ì[ˆ5W ‹[ˆ5Ý ŒNýGè&OFkð!™5W #1ýhxCn žçf-7h_z!L Fk(ý`ÌNýGè&OfçYh_® IO 7f ñFk Input @ 4_Å3Œ •;K#!'Æ6ð N«j¿` [ˆ5W ‹[ˆ5Ý Œ&O#Ö Ì[ˆ5W ‹[ˆ5Ý ŒNýGè&O FkPð!™5W #1ýhxCn •E 2 fç"å_ðPð!™fNý Gè&O"†Pä$ E .][¥+•)d[ÌNýGè&O2'fçYhFk#©5W •` _®HS Ýa4ŒU #Z #Ö3Œ5 NýGè&OFk5W3U Û

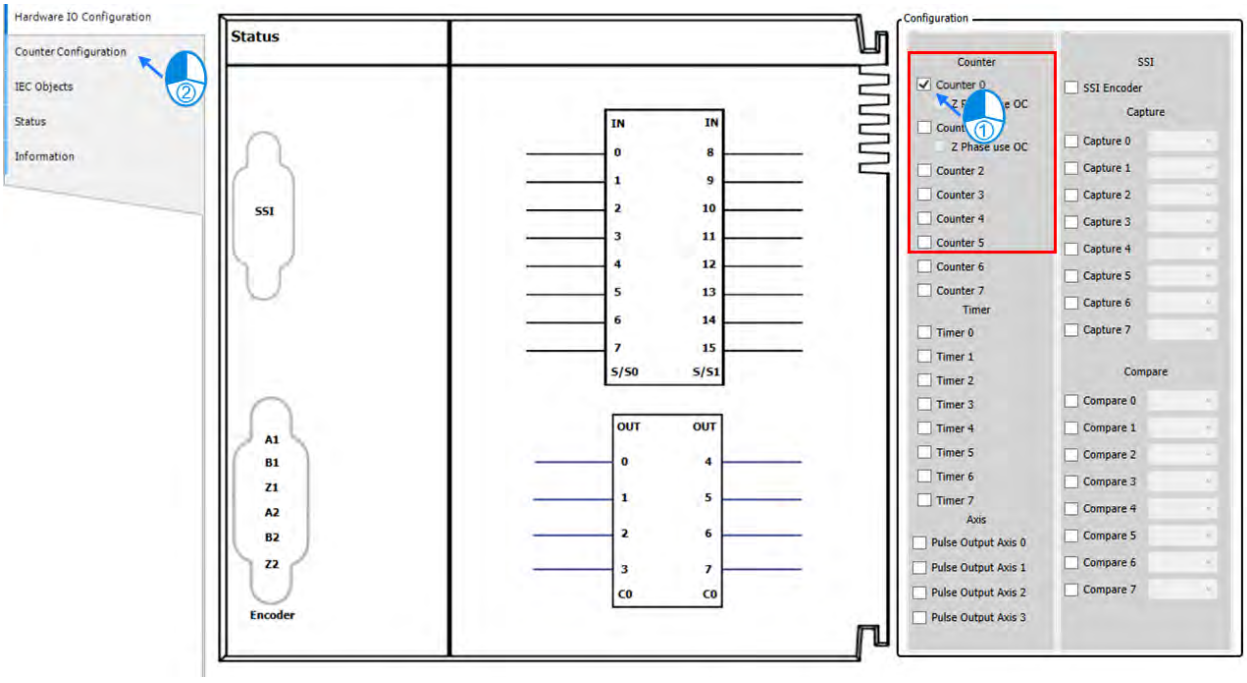
7 +öRi3¶_×7 : IO FkPð!™fNýGè&O"†Pä: '><)i ò&å Œ• AX-308E 5 2èj¿` [ˆ5W&O õj¿` +•5Ý&O0"$s6ç) 8 N« Û

z j¿` [ˆ5W&O ‹ Cnt Œ

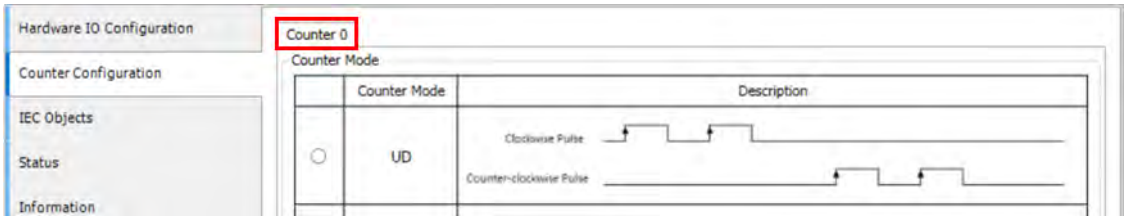


z j¿` [ˆ5W"†Pä$ "•

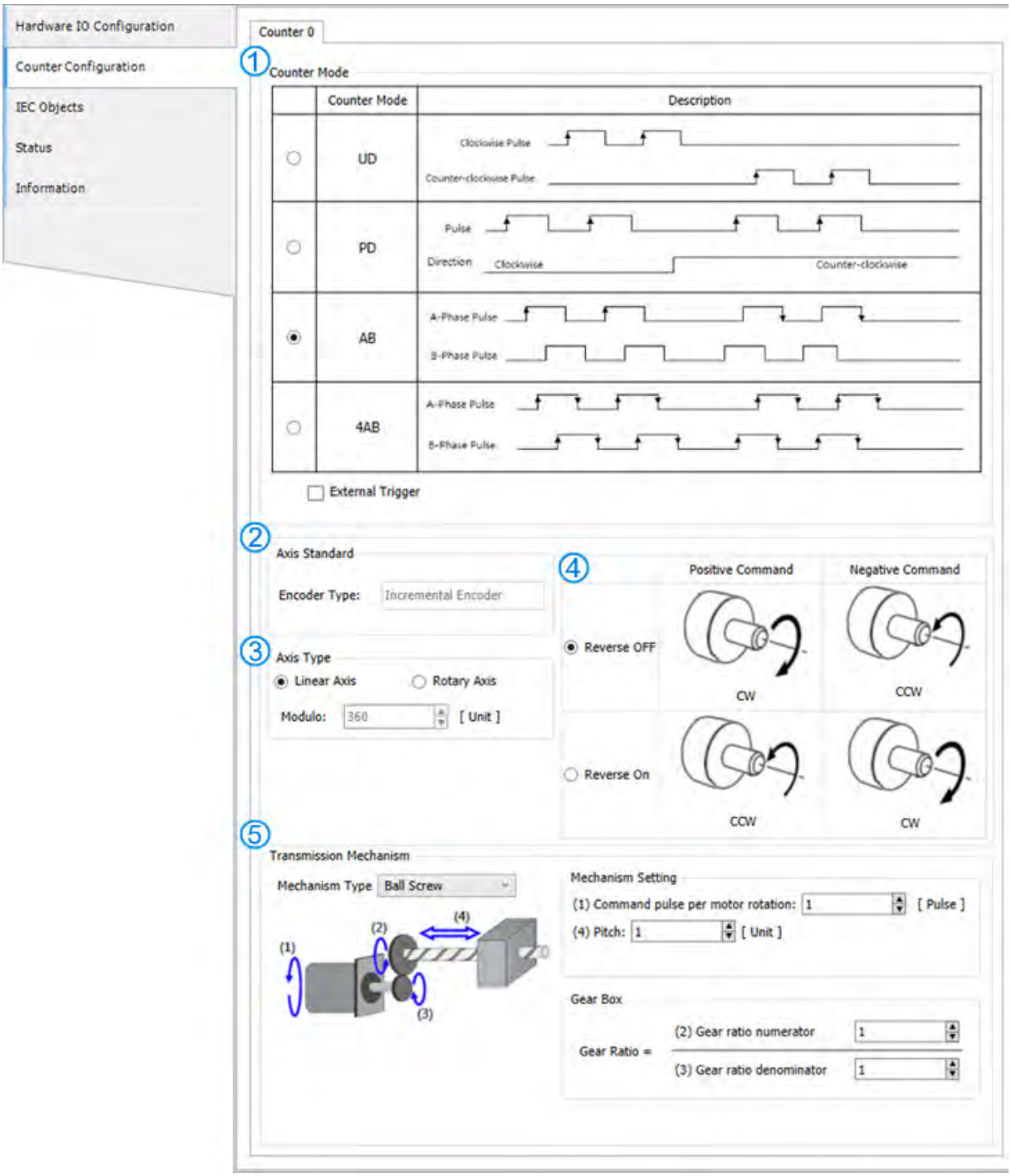
„ ' BuiltIn_IO E"gI •!X6ð 8 N«Counter • #<!â Counter 0 #õ!t #<!â Counter Configuration Û



„ ' Counter Configuration E"gI _ð2Ð1ø Ó"å_ðFkConuter 0 Fk!íh\



„ ' Counter Configuration E"gI #Ö[¥+• Counter FkFß!Z[¥+• • Ì òdo+à[¥+•[Û5õ •



„ c Counter Mode

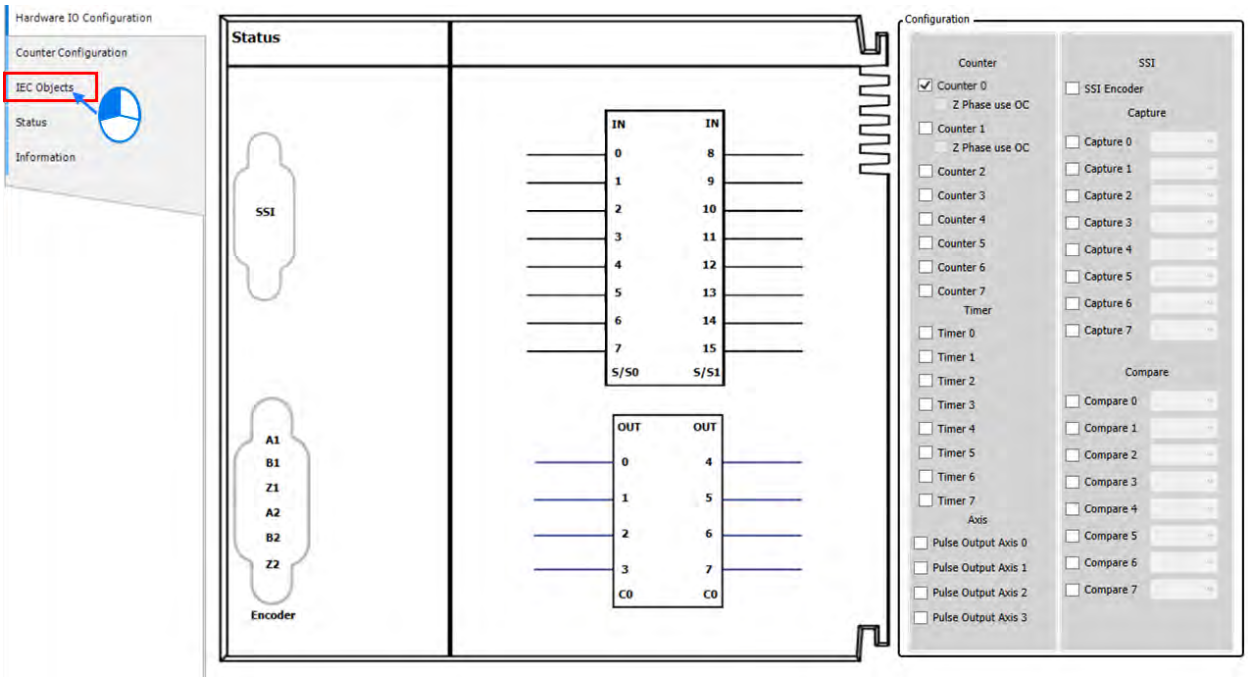
"ËH®	!]O»
UD	;J_SPð!™!þ#±_í_SPð!™!þ
PD	Pð!™!þ+5 #ø
AB	AB FßPð!™!þ
4AB	AB FßPð!™!þ ‹4x Œ
External Trigger	Z Fß È#Þ$ E

„ d e f g _V Ý[¥+•E"gI •#Ö#©OêK 7.7.7.3 Ri SSI NýGè&O"†Pä[¥+• Û

z Counter fE ' Iò.v •

j¿` [ˆ5W&OQÑ. FkNýGè&O_[#¿a¶ •;K#¿a¶ ,E 2 ' POU Fk_·"•"†Pä'> fE Û

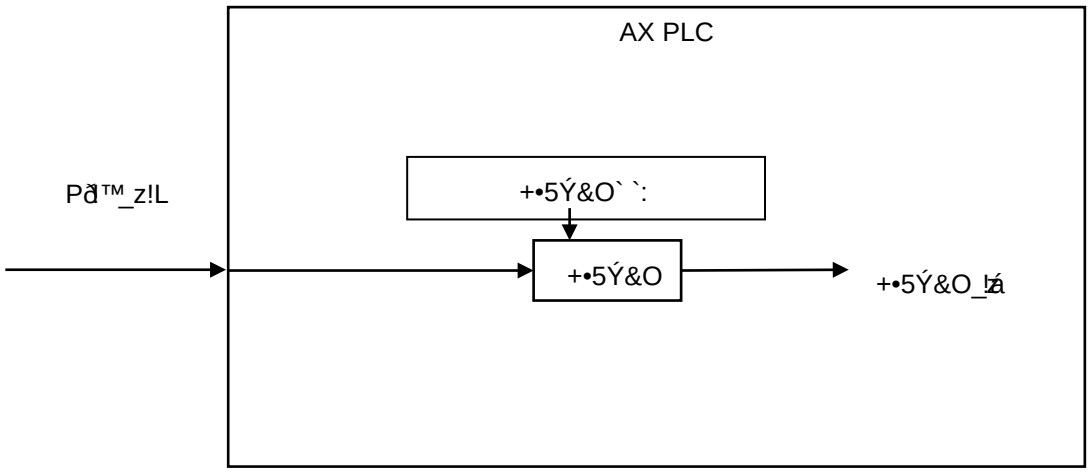
„ BuiltIn_IO E"gI #<!â IEC Objects



„ IEC Objects E"gI c !a4OU"†Pä ²N´ •RÌYh$ "• Counter [ˆ5W"†Pä •fç+í2'.áJ²Fk#¿a¶ Counter_0 _z!LQÚ"†Pä'>DFB_HCnt Fk Counter .üQ Û

„ ' POU fE MC_GerIn "†Pä'> • "_[7L>w)i fE Counter_0 •!]+à.{Fk_z!L#¿a¶ ! Encoder_Axis Û

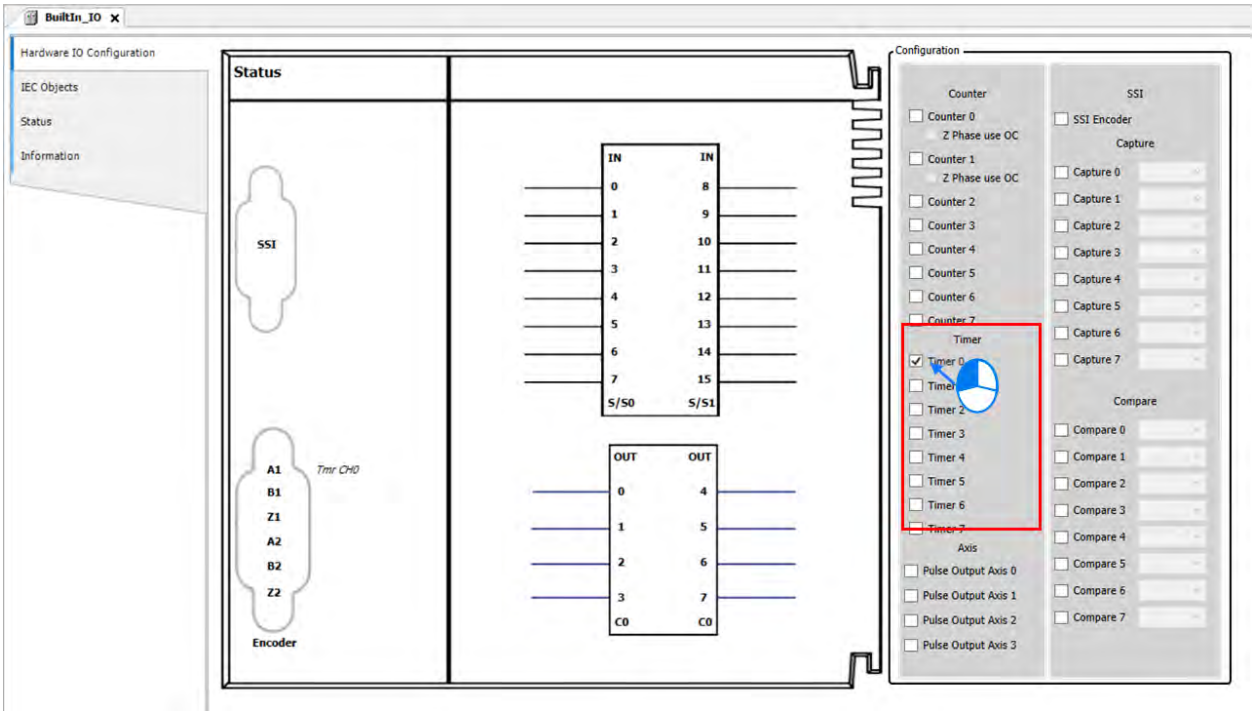
z j¿` [ˆ5Ý ‹Tmr Œ



7

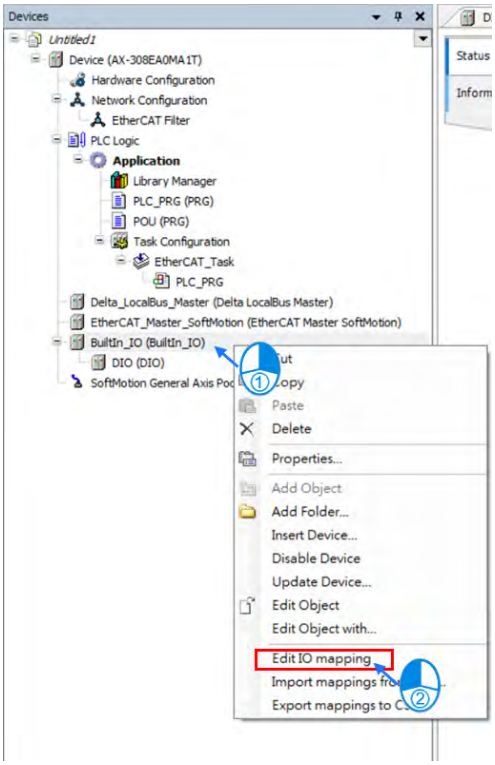
z j¿` [ˆ5Ý"†Pä$ "•

„ ' BuiltIn_IO E"gI • Timer !X6ð 8 N« •#<!â Timer 0 ÛE u Timer ôfç[¥+•E"gI2' Ì"å_ð+s;¼, #Ö Ì $ "• Ûj¿` +•5Ý&O' AX Lâ!þ!l`Ï[ˆ5Ý5Ýd† ! 0.1 s Û

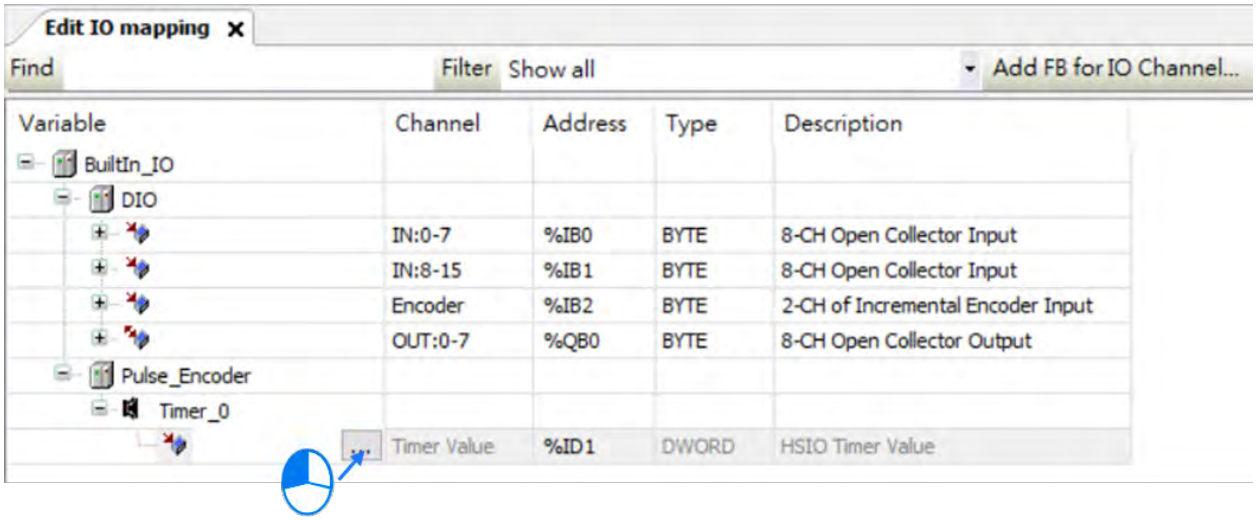


z [¥+• Timer 6 ¶#¿a¶

„ #<!â BuiltIn_IO #Úe •_ð2Ð Edit IO Mapping Û



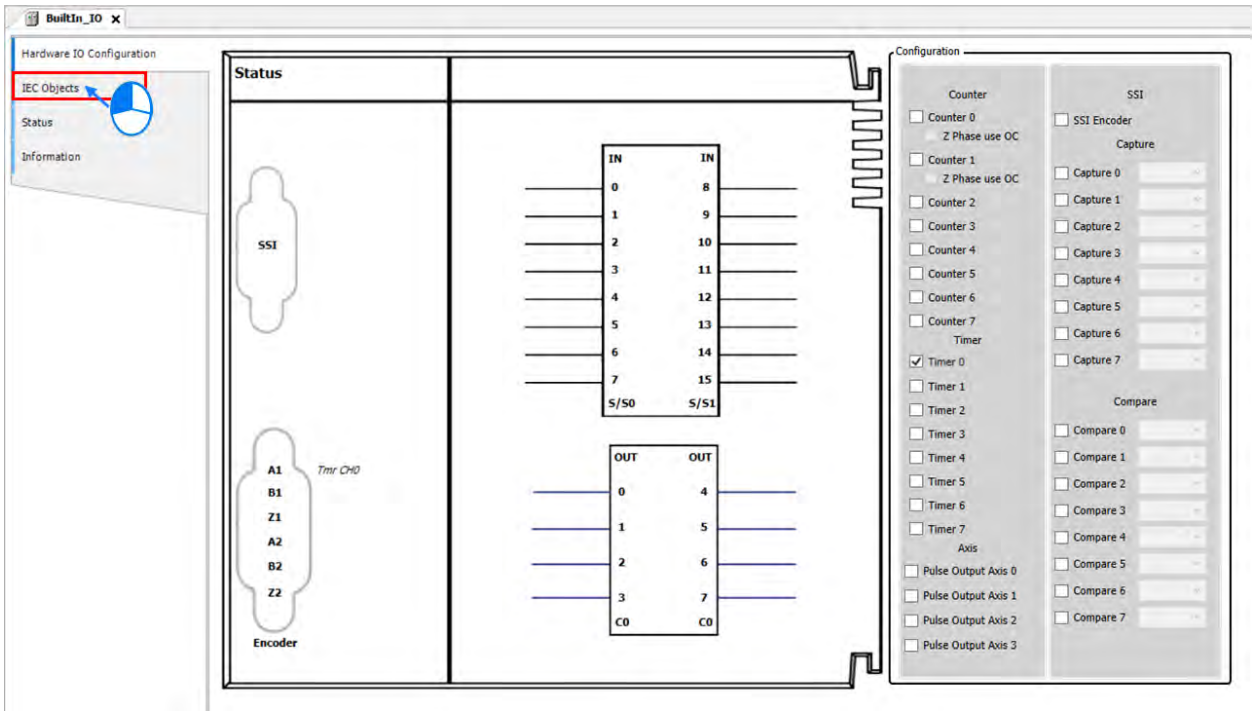
„ Edit IO Mapping E"gI •#<!â #õ5—(…#¿5W Û



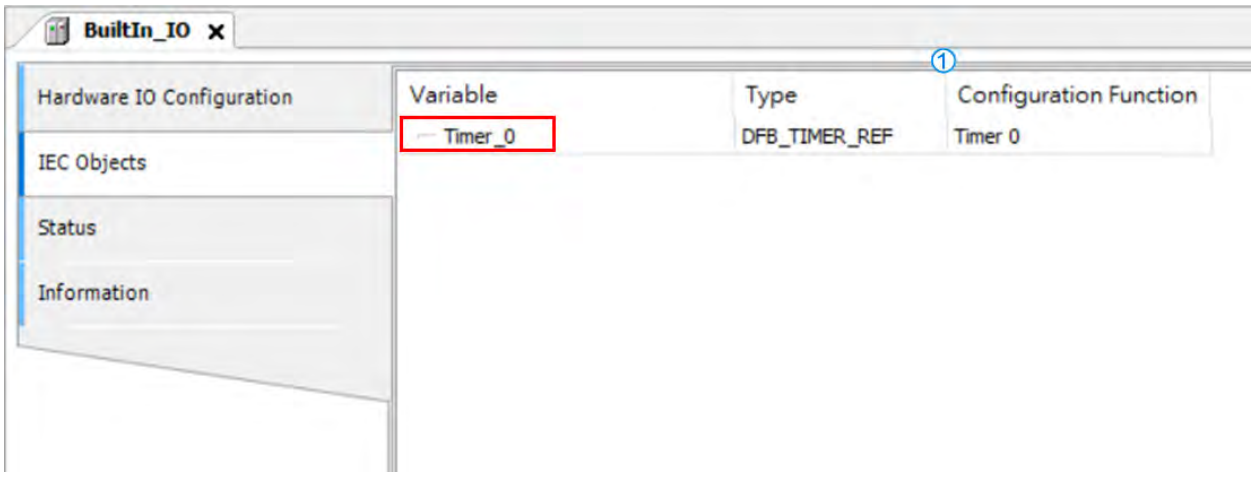
z Timer fE ' lò.v •

;K#¿a¶ ,E 2 ' POU Fk_·"•"†Pä'> fE Û

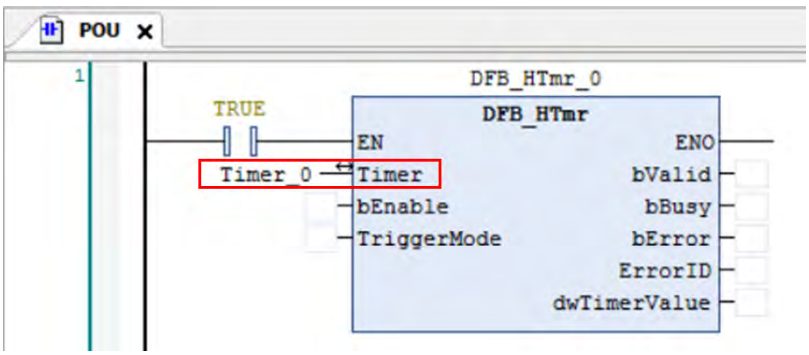
„ BuiltIn_IO E"gI #<!â IEC Objects



„ IEC Objects E"gI c !a4OU"†Pä ²N´ •do+à POU fE Fk_[#ôI×fç(R Timer_0 Û



„ ' POU do+à DFB_HTmr "†Pä'> •_z!LFk_[#ôI× ! Timer_0 Û

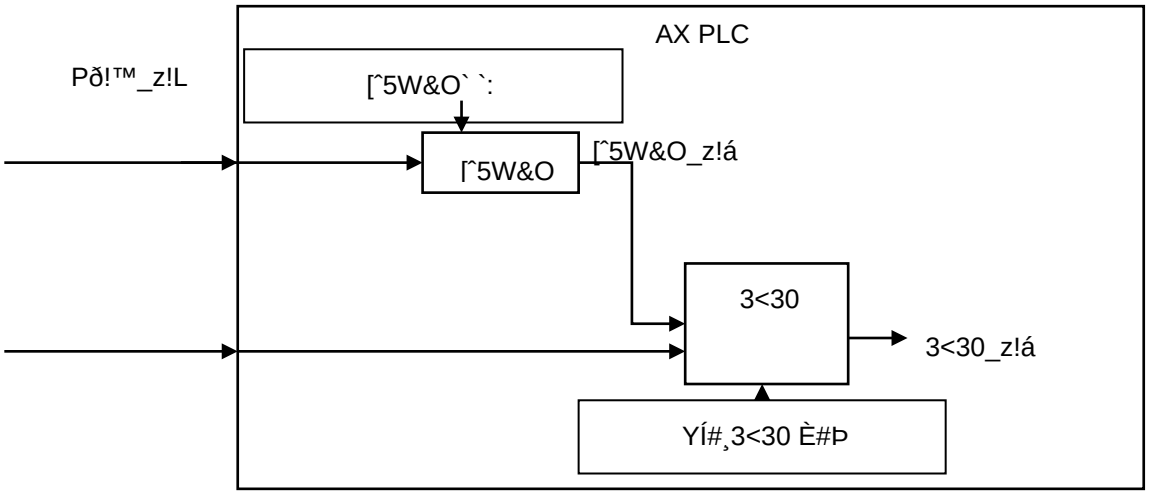


7

7.7.7.5 Capture/Compare !]O»Z|*X

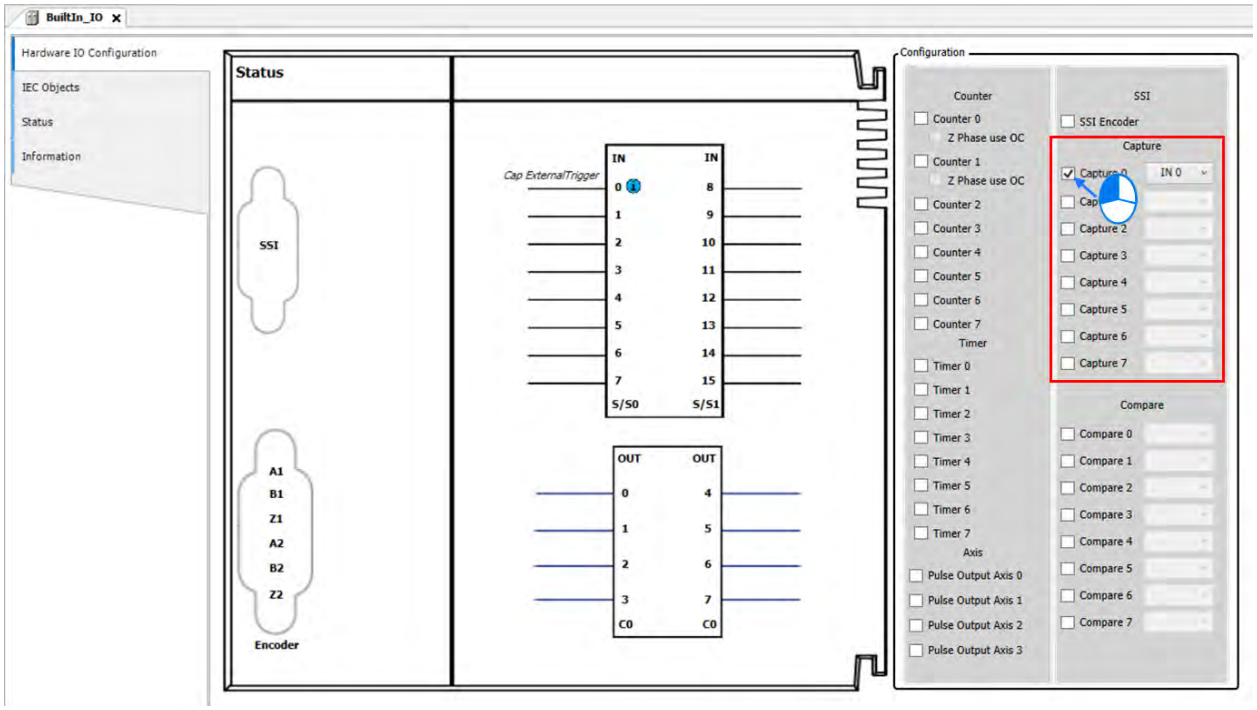
7 +öRi3¶_×7 : IO Fkj¿` [^5W;»_j&O õ3<30&O"†Pä: '> ‧ AX Lâ!þ5 2èj¿` 3<30&O õj¿` [^5W;»_j&O0" $s6ç) 8 N« Û

z j¿` [^5W3<30&O ‹Capture Œ

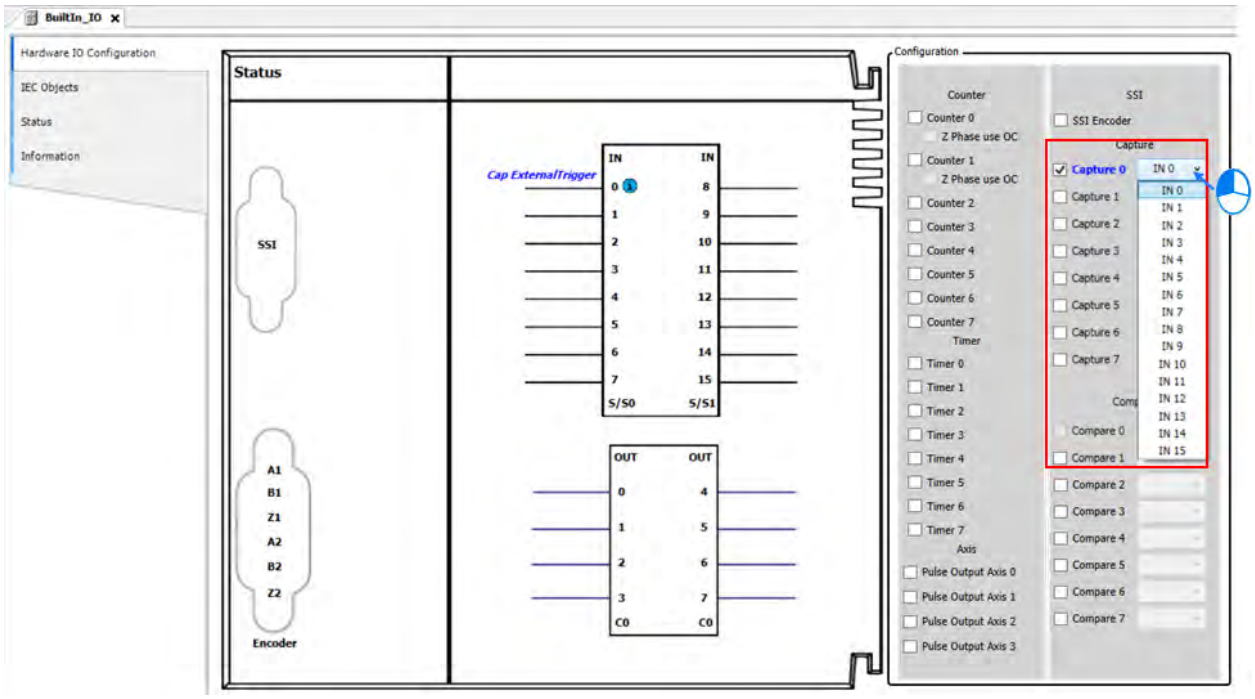


z Capture "†Pä$ "•

„ ' BuiltIn_IO E"gI • Capture !X6ð 8 @ 4 •#<!â!] ç $ "• Û



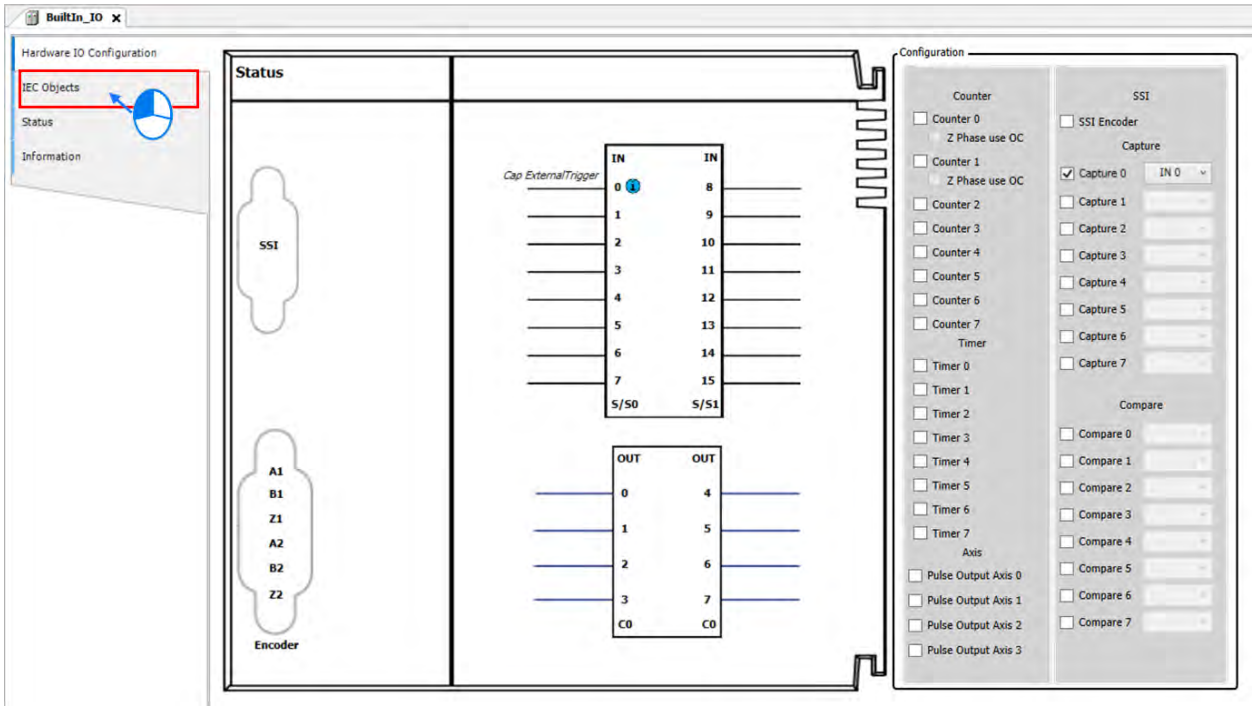
„ $ "• Capture #õ#<!â ò2°.ö_ð#< •_ð2Ð(ý`ÏYÍ#¸7L>w Û



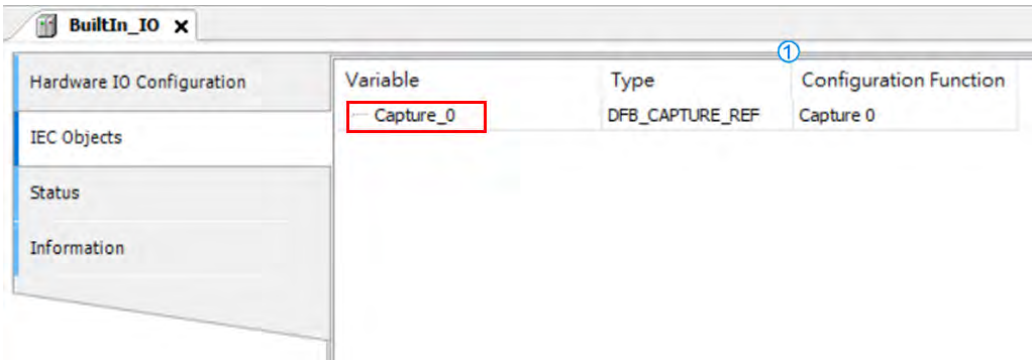
z Capture fE ' Iò.v •

;K#¿a¶ ,E 2 ' POU Fk_·"•"†Pä'> fE Û

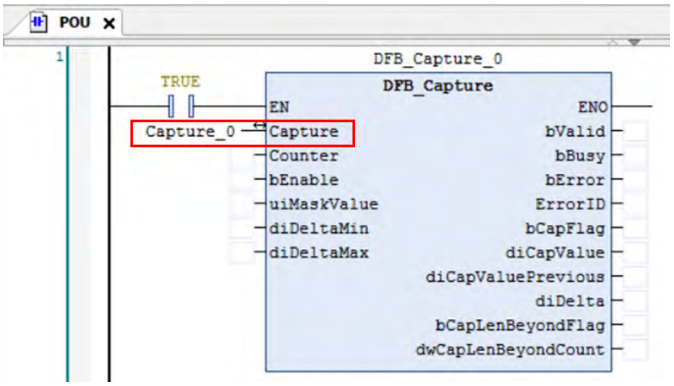
„ BuiltIn_IO E"gI #<!â IEC Objects



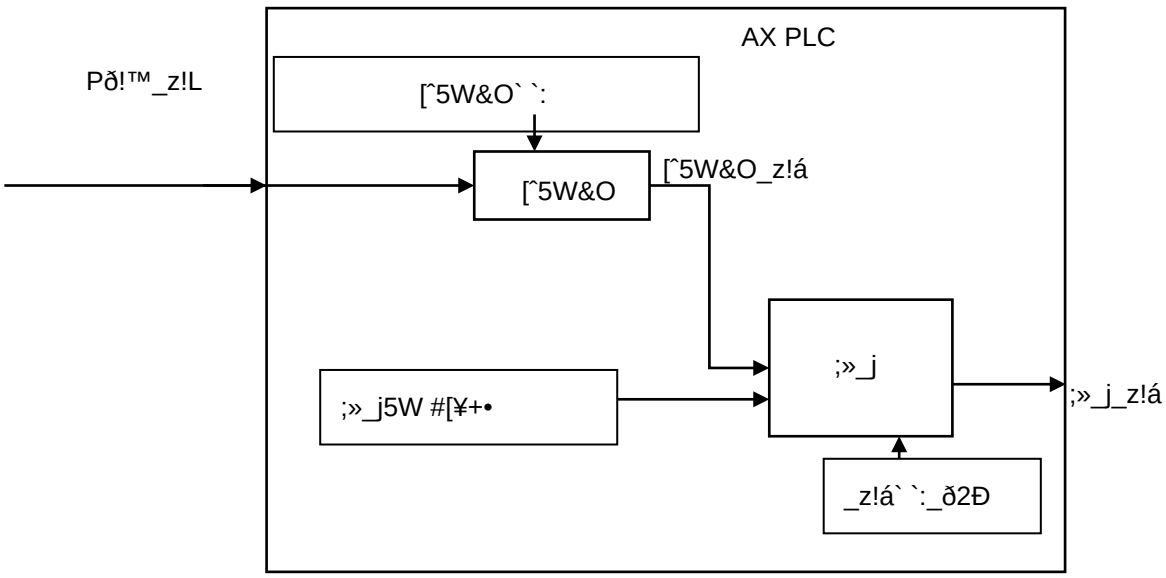
„ IEC Objects E"gI c !a4OU"†Pä ²N´ •do+à POU fE Fk_[#ôI×fç(R Capture_0 Û



„ ' POU do+à DFB_Capture "†Pä'> •_z!LFk_[#ôI× ! Capture_0 Û

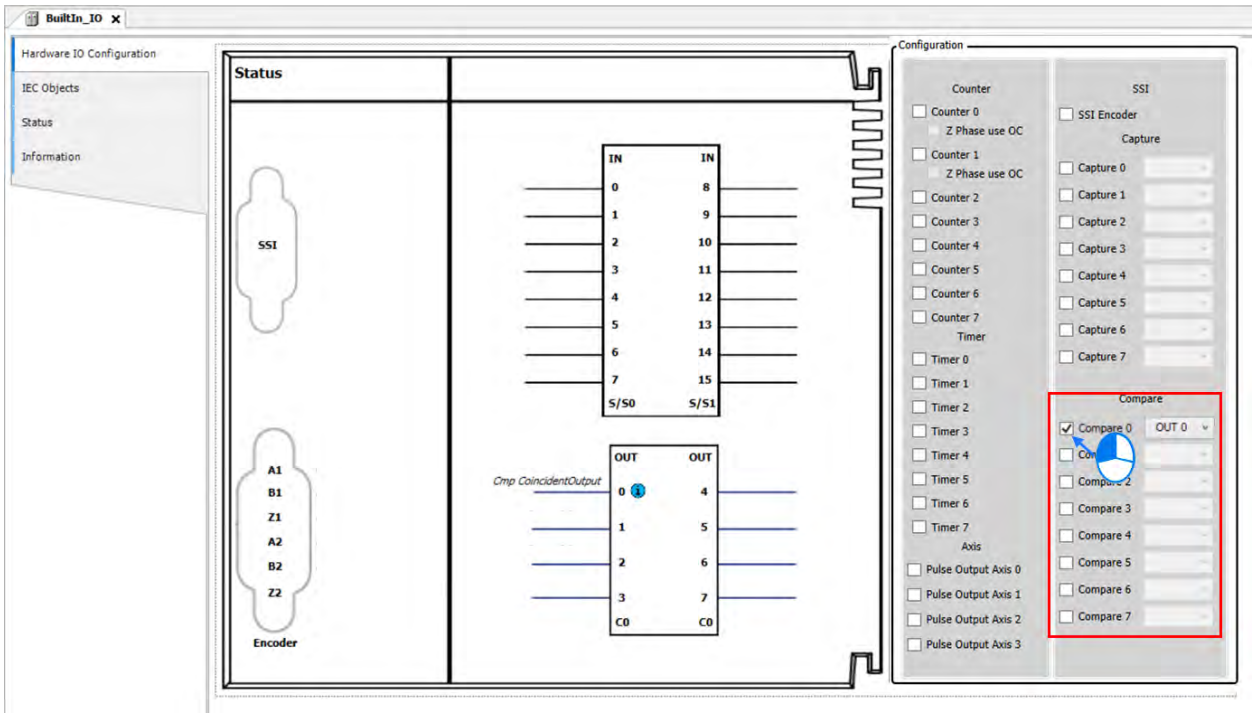


z j¿` [^5W;»_j&O ‹Compare Œ

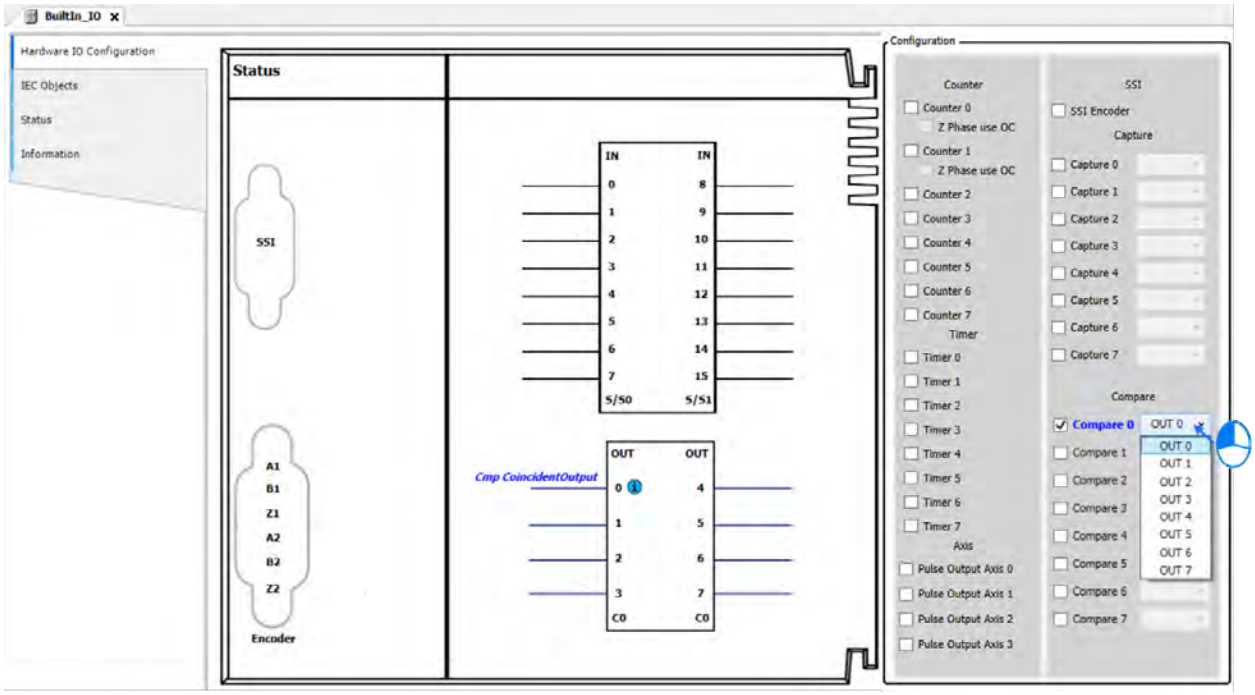


z Compare "†Pä$ "•

„ ' BuiltIn_IO E"gI • Compare !X6ð 8 @ 4 • #<!â!] ç $ "• Û



„ $ "• Compare #õ#<!â ò2°.ö_ð#< •_ð2Ð Compare ;»_j1÷"†_z!á(ý`Ï3Œ@ Û

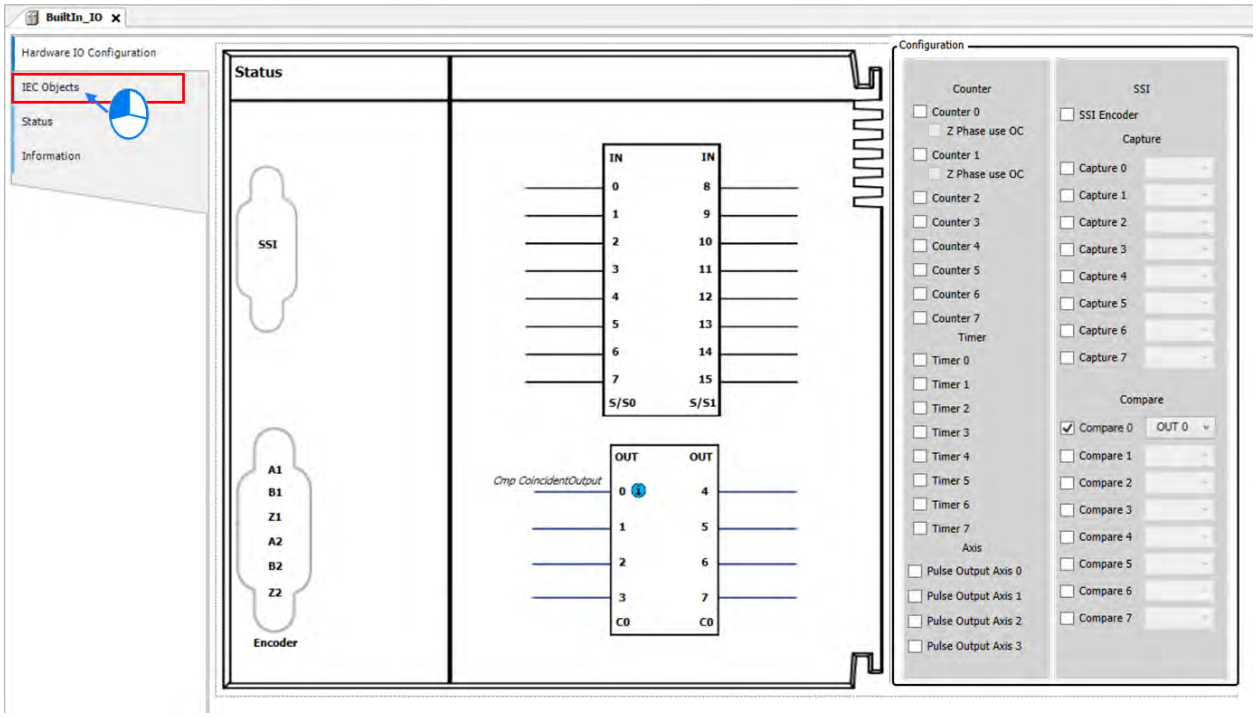


7

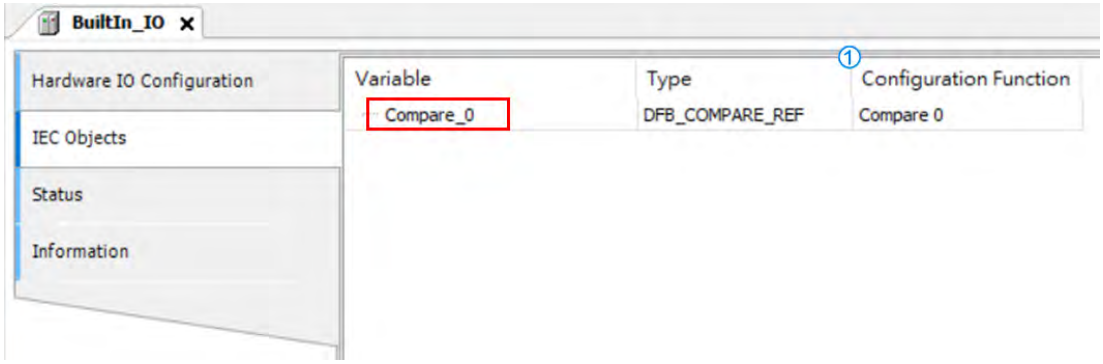
z Compare fE ' lò.v •

;K#¿a¶ ,E 2 ' POU Fk_·"•"†Pä'> fE Û

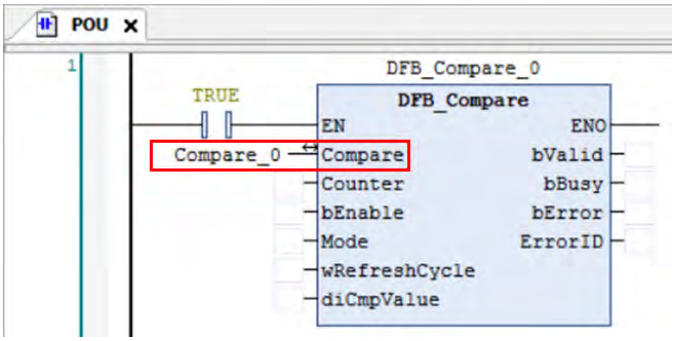
„ BuiltIn_IO E"gI #<!â IEC Objects



„ IEC Objects E"gI c !a4OU"†Pä ²N´ •do+à POU fE Fk_[#ôI×fç(R Compare_0 Û



„ ' POU do+à DFB_Compare "†Pä'> •_z!LFk_[#ôI× ! Compare_0 Û

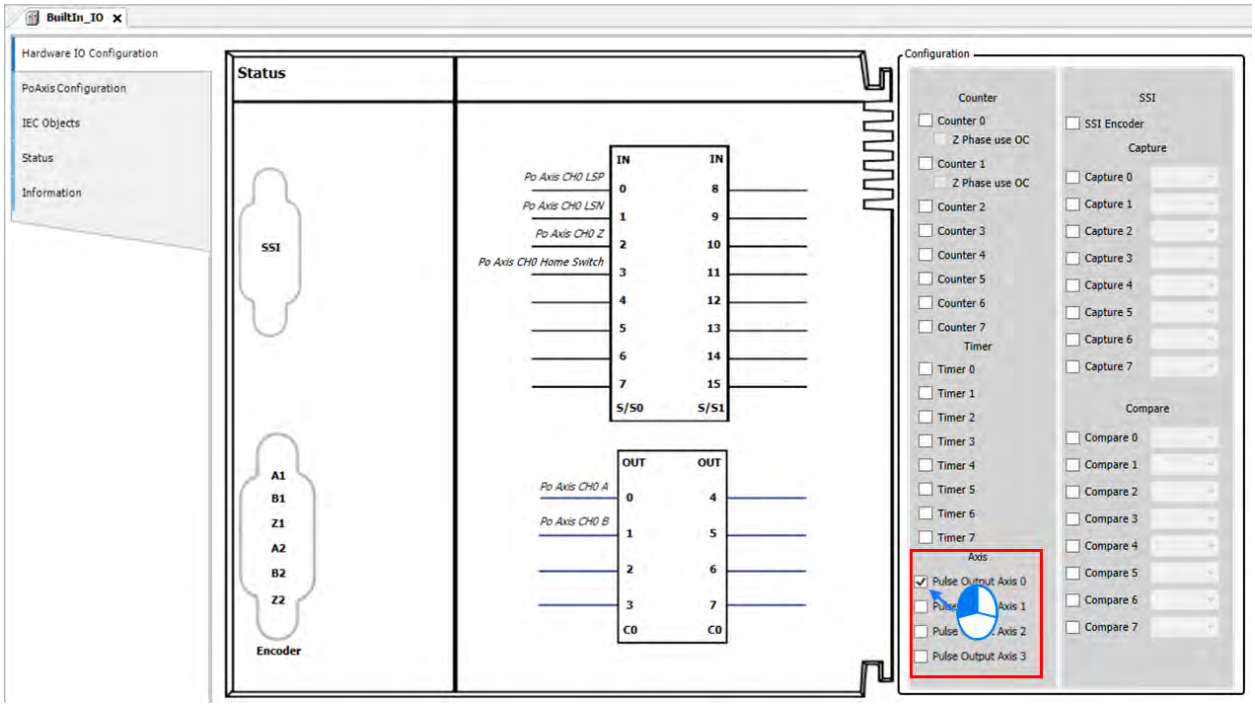


7.7.7.6 Pulse Output !]O»Z|*X

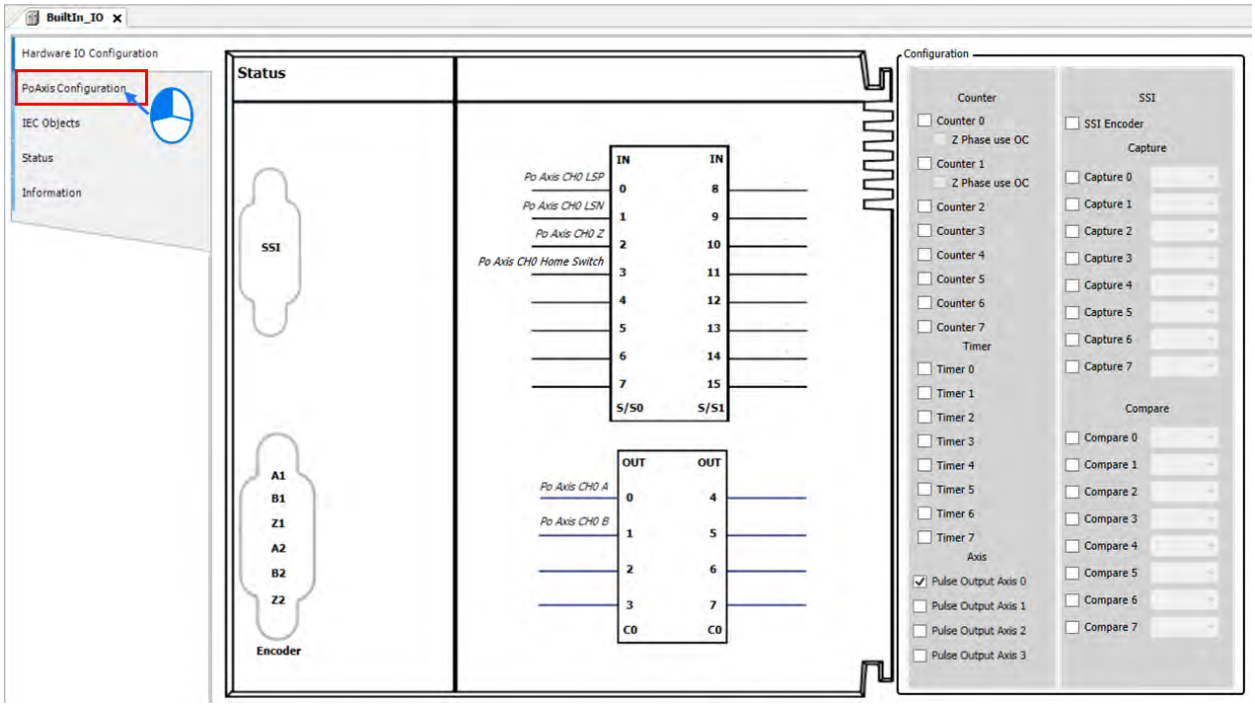
7 +öRi3¶_×7 : IO Pð!™z!á"†Pä: '> ‹)i ò&å Œ•' AX-308E 5 2è6ç) 4 N«Pð!™z!áX¬OU ,_ð2Ð fE Û

z Axis "†Pä$ "•

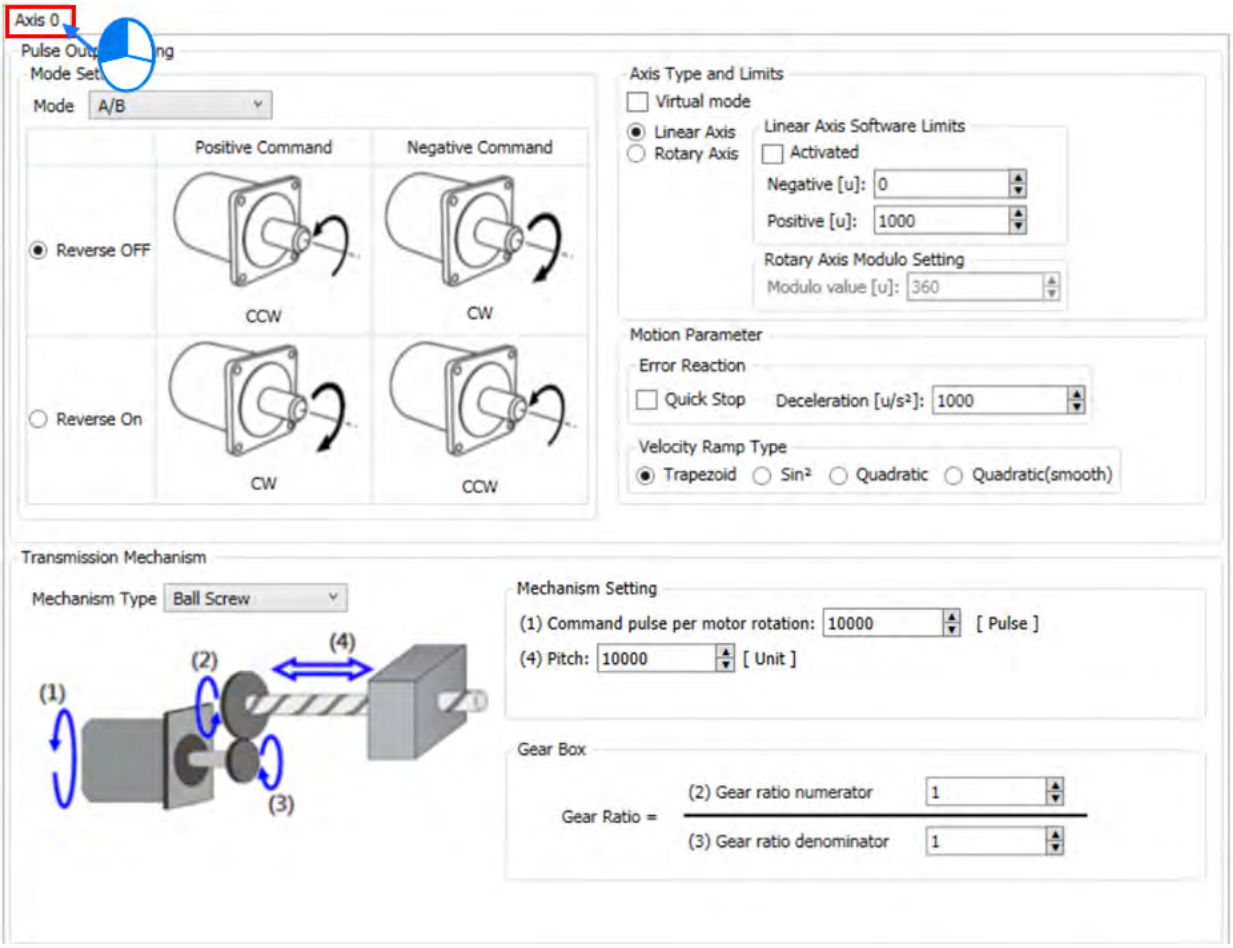
„ ' BuiltIn_IO E"gI • Axis !X6ð 4 _[Pð!™z!á •#<!â!] ç_[$ "• Û



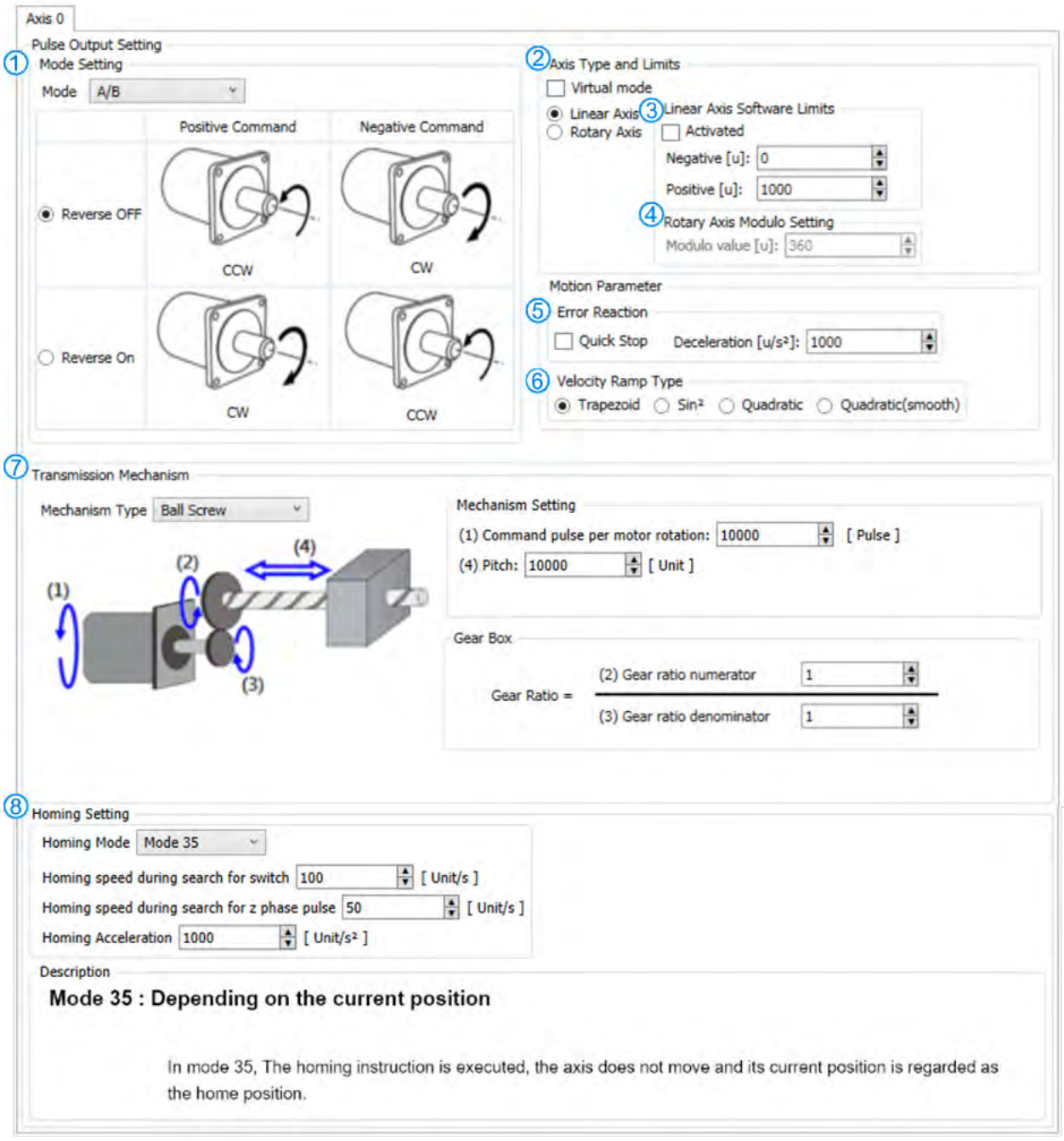
„ $ "• Axis #õ!t@ PoAxis Configuration



„ ' PoAxis Configuration E"gI#õ#<!â Axis 0 !íh\



„ ' Pulse Output Setting E"gI #Ö[¥+• Axis FkFß!Z[¥+• • Ì òdo+à[¥+•[Û5õ •



„ c Mode Setting

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Mode	[¥+•_z!áPð!™Lb'r	CW/CCW Pulse and Direction ‹A/B Œ
Reverse On ’ Reverse OFF	[¥+•Pð!™_[;J/#´_S	Reverse ON Reverse OFF ‹Reverse OFF Œ

„ d Axis Type and Limits

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Virtual	$ "•VA_[	TRUE FALSE ‹FALSE Œ
Linear Axis ’Rotary Axis	[¥+•FÛN¦_[1ý5²_S_[	Linear Axis Rotary Axis ‹Linear Axis Œ

„ e Linear Axis Software Limits

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Activated	$ "•_V Ý7hf7 ‹ ¬5 2èFÛN¦_[Œ	TRUE/FALSE ‹FALSE Œ
Negative[u]	#´_S_V Ý7hf7	‹0 Œ
Positive[u]	;J_S_V Ý7hf7	‹10000 Œ

„ f Rotary Axis Modulo Setting

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Modulo Value[u]	[¥+• ç&ïRê&Û ‹ ¬5 2è5²_S_[Œ	‹360 Œ

„ g Error Reaction

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Quick Stop	_[M 0 C;I	‹360 Œ
Deceleration[u/s²]	_[!¶` C;I ‹7 $ "• Quick Stop 246ð5/ Œ	‹10000 Œ

„ h Velocity Ramp Type

"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Trapezoid/Sin²/Quadratic/ Quadratic ‹Smooth Œ	[¥+•_[_·"•6ÙN¦	‹Trapezoid Œ

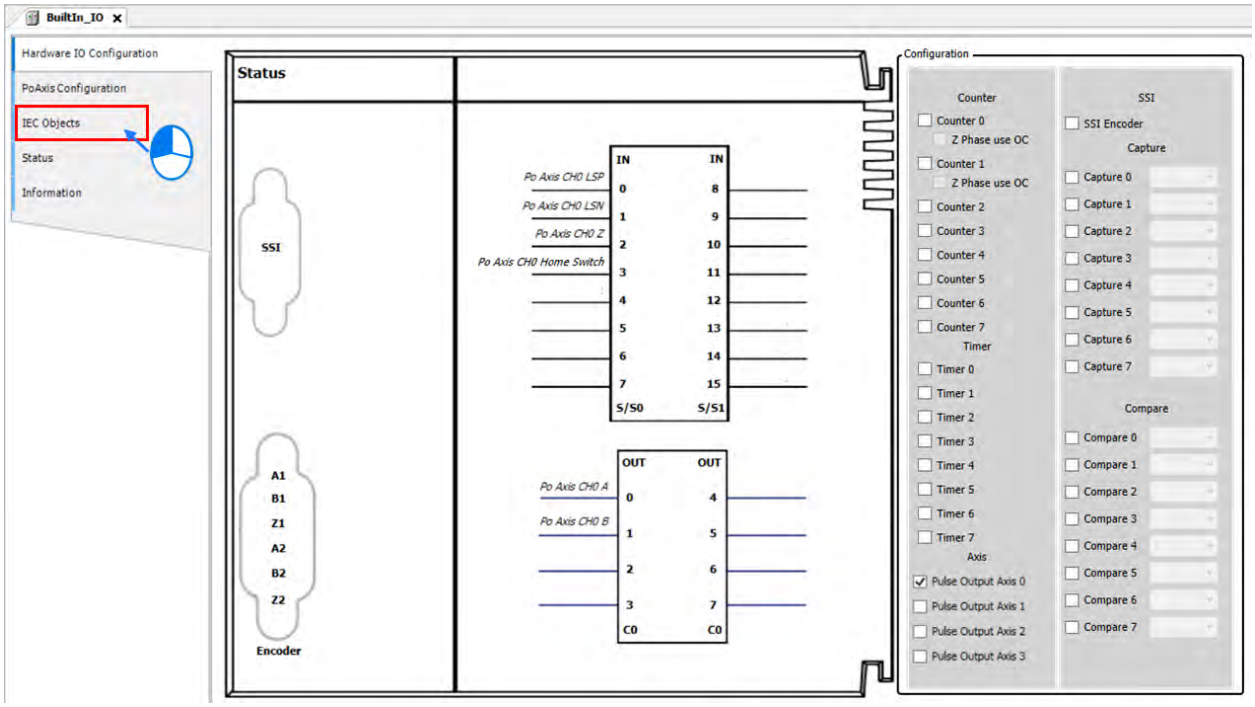
„ i _V Ý[¥+•E"gI •#Ö#©OêK 7.7.7.3 Ri SSI NýGè&O"†Pä[¥+•

„ j Homing Setting

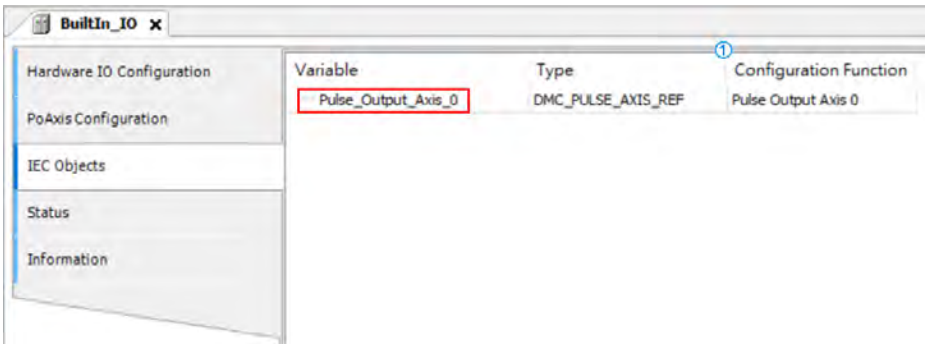
"ËH®	!]O»	Z|*X4. úoÑm–Zb úoÒ
Homing Mode	[¥+•#†@ : .ö	‹Mode 35 Œ
Homing soeed during search for switch	[¥+•+â#†@ .ç!Z` .•	‹100 Œ
Homing speed during search for z phase pulse	[¥+•+â Z Fß` .•	‹50 Œ
Homing Acceleration	#†@ ` .•	‹1 000 Œ

z Pulse Axis fE ' Iò.v • Pulse Axis fE ' POU •fç fE ;K#¿a¶' POU Fk_·"•"†Pä'> fE Û

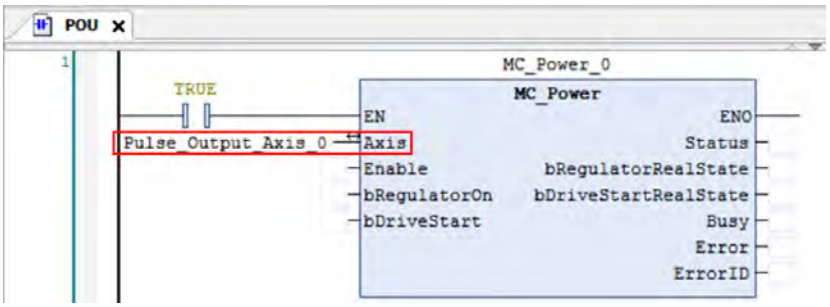
„ BuiltIn_IO E"gI #<!â IEC Objects



„ IEC Objects E"gI c !a4OU"†Pä ²N´ •do+à POU fE Fk_[#ôI×fç(R Pulse_Output_Axis_0 Û

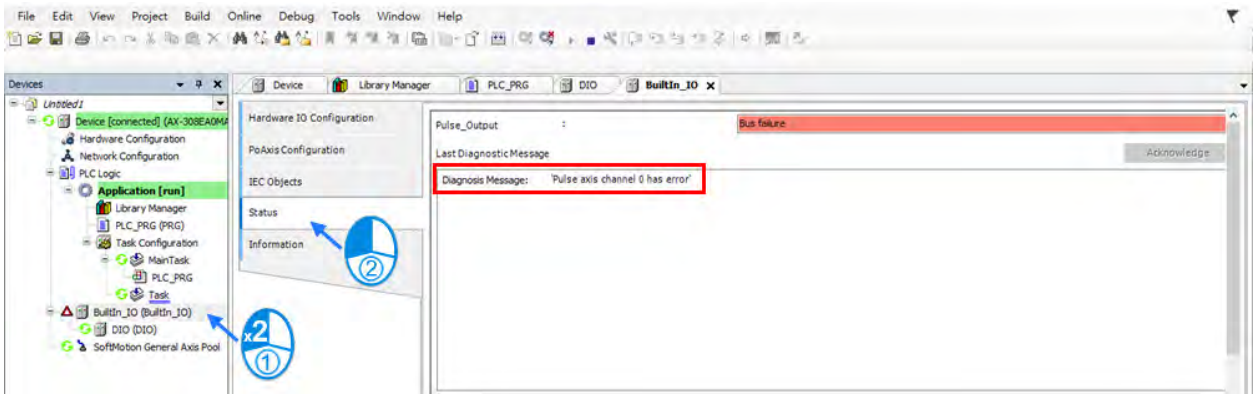


„ ' POU do+à MC_Power "†Pä'> •_z!LFk_[#ôI× ! Pulse_Output_Axis_0 Û

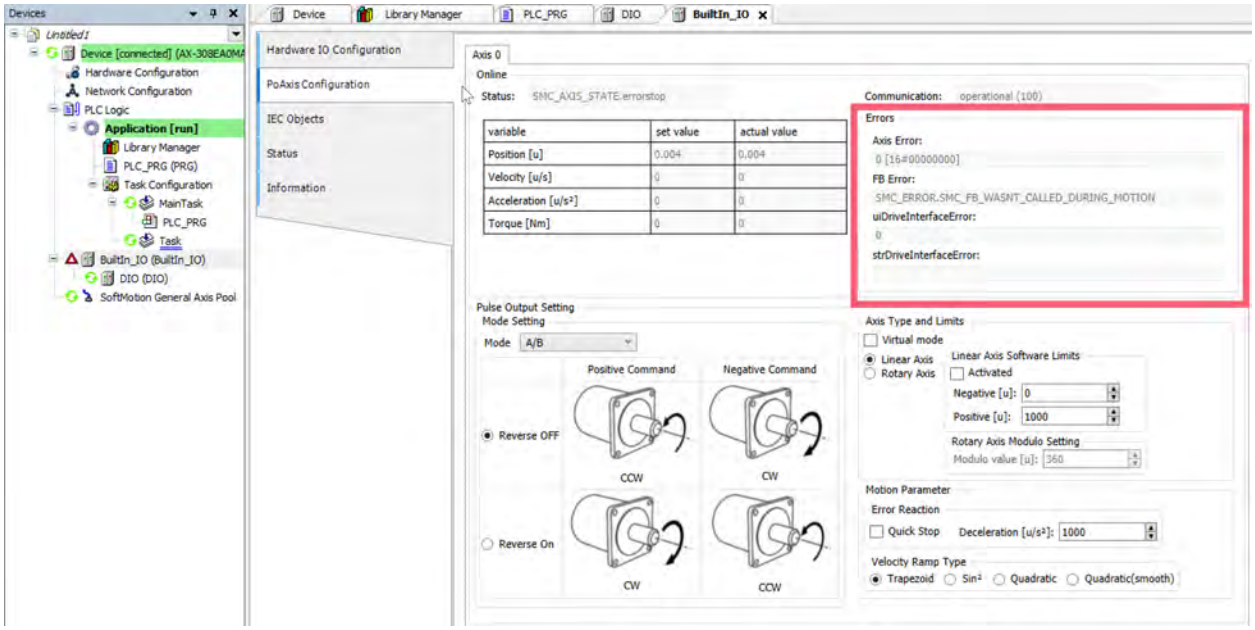


7.7.7.7 i–^Ý IO c×Z-G,Zb

/: Pulse Output Axis #¸E e [Ö5Ý 6%I!' BuiltIn_IO Fk Status •.]$1GÌ$Ñ çN«Pð!™_[#¸E e [Ö Û



3ŒG'E 2 #Ö Ì' PoAxis Configuration • Ì' N¦F¸3ŽFk5 .ö7ÌFòe [Ö È0V Û



7.7.8 4*A!]O»

7.7.8.1 5²3÷Bn%æ N,

MC_SetPosition

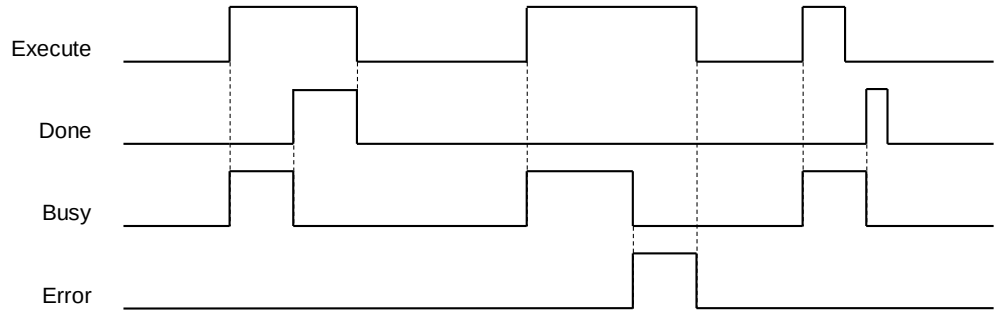
+í !6ô_[Fk2î Ë/:"4 4OU#¿6Û !2î+•FkFÕ7î 4OU Û;K(ý+àNýGè&O_[2NX32î Ë#õ •+í#´io/:"4 4OU#¿6Û !2î +•FkFÕ7î 4OU Û

' 2î Ë/:"4 4OU#¿6ÛFk#ó5Ý •#´io/:"4 4OU F #¿6Û • OìeÛFk_äfv[Ö-Õ Ä2è ô#¿ Û

;K"†Pä'> CE 6 5 #¿'77îLâ • ô f !6ô#±E 7! ŽE Iâ"• Û

NýGè&O_[#Ö` _®;K"†Pä'> Õ5 /:"4 4OU Û

z .üQ 5Ý.v&å



7.7.8.2 ^-´6?e

f7" _[Iâ"•Rê&ÛfK mHS Ý7hf7 Ì(ý_¿6ð_V Ý7hf7 Û

/:$ "•_V Ý7hf7 *fç[¥+•;J7hf7 õ#´7hf7Rê&Û # Û E 2 4´ Ce [Ö#Öf ;I[¥(îFk3F'6 •n¿[‹ ô.ç$ _[:7hf7"†Pä Û

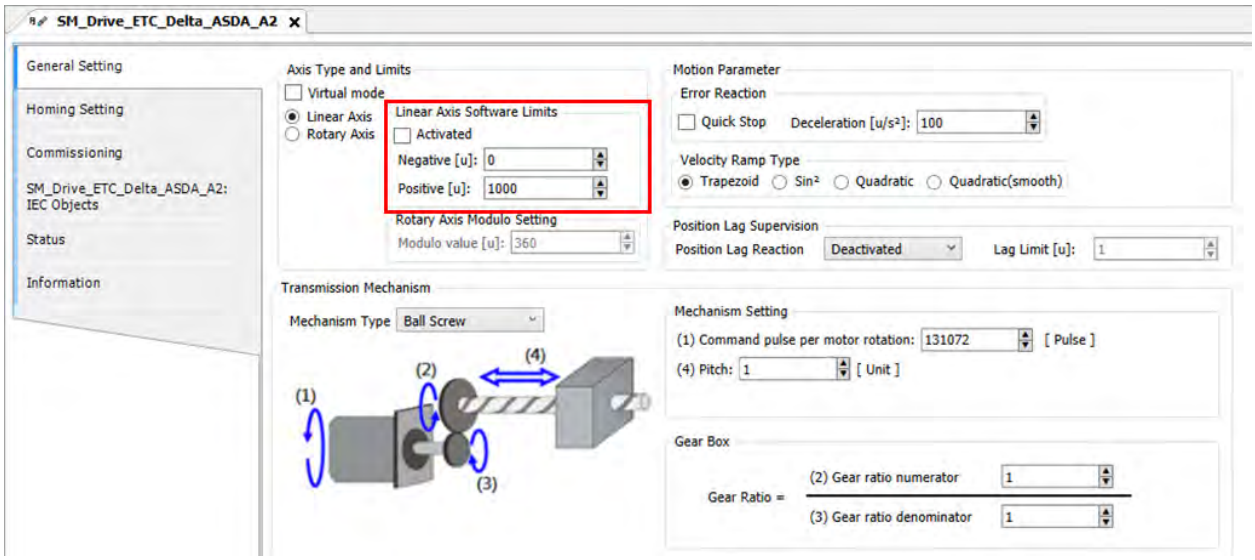
HS Ý	_V Ý	_V Ý	HS Ý
;J7hf7	;J7hf7	] 7hf7	] 7hf7

_[Iâ"•Rê&Û

*<Ï • C;IRê r#Ö#©OêK 7.7.2.4 Q@Ů

z _V ÝE"gI

#Ö` _®DIADesigner-AX _ÂX3[¥+• •



' [¥+•h\gI #Ö[ê5[;J#ø/ #´#ø 4OU) +ö •

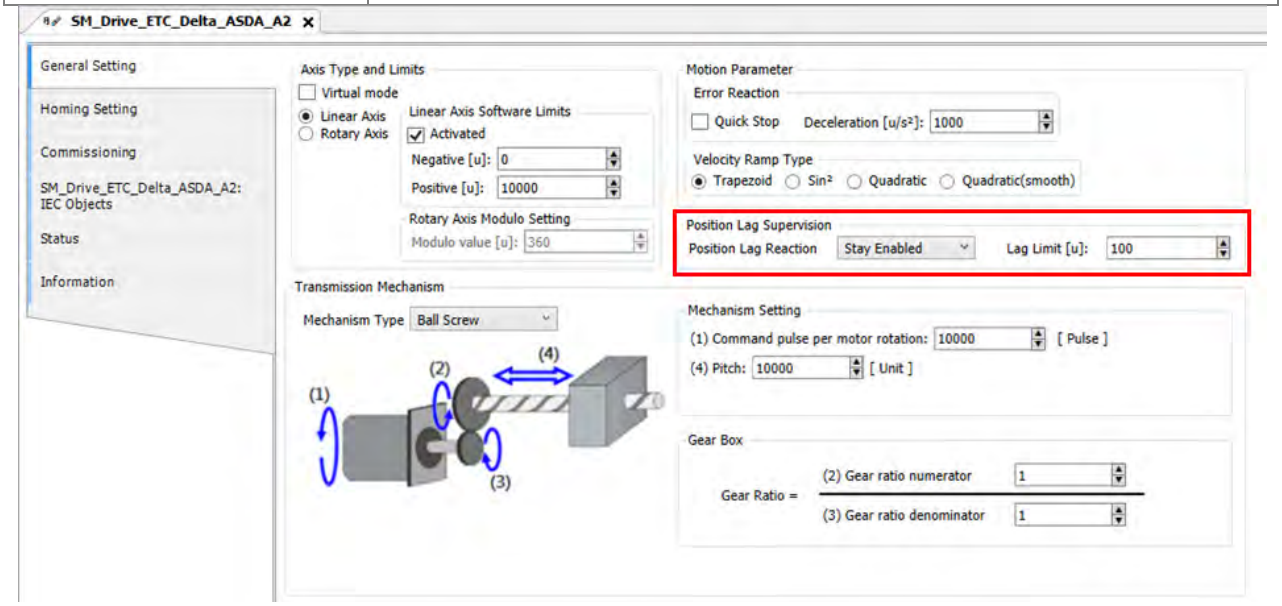
#ôI×	5W3ULb'r	n¿[‹
Negative	LREAL	0.0
Position	LREAL	10000.0

7.7.8.3 ^»eMZ-,¬Z|*X

2NX3_[Iâ"•5Ý$d Ë 4OU õ+…f‚4OU ! 0 •/:Iâ"•_®Iò $d Ë 4OU õ+…f, 4OU-Õ.é)) 5Ý, 2Œe •n¿[‹ 7 $ "•_äfv[Ö-Õ"†Pä Û

#ôI×	"†Pä
Deactivated	7 $ "•
Disable drive	_äfv[Ö-Õ]I!á[¥+•7hf75Ý •_[servo off
Do quickstop	_äfv[Ö-Õ]I!á[¥+•7hf75Ý •_[quick stop

#ôI×	"†Pä
Stay enabled	_äfv[Ö-Õ]l!á[¥+•7hf75Ý •_[NÛ2è servo on



7.7.8.4 1ø6 ?w!]O»

MC_DigitalCamSwitch

[¥+• C7-@ 4OU •/:_[_·X3QÚ2î+• 4OU#õ ! True •I¢.ç2î+• 4OU#õ False Û Ì ò ![¥+•Rê r •

z [¥+•Rê r •Rê r[Û5õ' MC_DigitalCamSwitch 2î Ë fE 2 Switch ' #ó ç Track 2 Û

„ #©5W[¥+• •

"€4."ËH®	Type	Switch1	Switch2
TrackNumber	INT	1	1
FirstOnPosition [u]	REAL	200	400
LastOnPosition [u]	REAL	300	-
AxisDirection	INT	0=Both	0=Both
CamSwitchMode	INT	0=Position	1=TIME
Duration	TIME	-	2500ms

„ YÍ#¸"• C õ5Ý.v •

- Track1 ñFk Switch1 ' 4OU_¥ 200 5Ý.ç$ •/:_[4OU2œ_¥ 300 5ÝSwitch1 !ZeÔ ž
- /: 4OU_¥ 400 5ÝSwitch1 !t; .ç$ •N¶_® 2500ms #õ Switch1 !ZeÔ Û

7.7.8.5 2 2 N,

MC_TorchProbe fE 1 &O/: CYÍ#¸ È#Þ•Ì¬í È#Þ_z!LQÚ !6ôjX"•&O •/: È#Þ YÍ#¸5Ý[—/< !6ô/: ò 4 OU Û;¶_[#Ö Ì[¥+• YÍ#¸ È#Þ ÛMC_AbortTrigger N¯;I3<30"• C Û

"†Pä[Û5õ •

/: MC_TouchProbe "†Pä'>Fk_z!L.üQ Execute ! True 5Ý •#Ñ 2z#½K ç; YÍ#¸ È#ÞFk6ð5/ 4OU # • 2 #õFkYÍ#¸ È#Þ+íX'/äEL Ûç "†Pä'>+… :‹instance Œ#ÑPä+à.{ ç MC_TouchProbe 2î Ë Û)i7ƒ' ç Fß#óFk _[6ð5W MC_TouchProbe "†Pä'>+… r5Ý •MC_TRIGGER_REF fç fE #Í(ýFk TouchProbeID • Ì ¦#!!í ô#ó Fk TouchProbe "• C ÛTouchProbeID #ó5Ý F+à.{" MC_AbortTrigger Û

MC_TouchProbe Fk window "†Pä CE)i ò[Û5õ •

PLC #½8 5ÝeÛ@

Execute
- True
- False

TriggerInput
- True
- False

Done
- True
- False

WindowOnly
- True
- False

Position

LastPosition

RecordedPosition

FirstPosition

YÍ#¸ È#ÞX'/äEL YÍ#¸ È#ÞX'2z#½

' ñ&åFkK ç; YÍ#¸ È#Þ_z!L5Ý • È#Þ ôX'3Œ#¾ •&Ç !_[4OU<^6ð" _¥ Window Mask Fk#!;œ Û

' ñ&åFkK s; YÍ#¸ È#Þ_z!L5Ý • È#ÞX'3Œ#¾ •&Ç !_[4OU-ÙN¶" _¥ Window Mask Fk#!;œ Û.] û' 2z#½ È#Þ+s1÷#õFk ò ç $O7 •_z!á È#Þ Done ! True Û

7.8 QÁ IHÉ-M

ò!þdo+à7 JÇRiRê rIò.v_ÂX3 ç ,'á7 [Û5õ Û

7.8.1 Z|'Å6t6B

ò!þRi[Û5õRê rIò.v fE Ì ò[¥(î Û

Z|'Å	6B0ÎQÁ I
CPU	AX-308E
Power	DVP-PS02
!6ôjX"•&O	#×_¥ASDA-A2-E
!6ôE 7!	#×_¥ECMA-C

7.8.1.1 =CæZ|'Å

!Z u fE [¥(îFk[¥OU õ3ŒN¦ •[Þ#©Oê ò!þ22!s Û

Z|'Å	6B0ÎQÁ I
CPU $s Power	[Þ#©Oê;K22!sK sJÇ
!6ôjX"•&O	[Þ#©Oê#×_¥ !6ô22!sFß!Z[¥OU
EtherCAT µJÀFk3ŒN¦	[Þ#©Oê#×_¥ !6ôA2-E 22!s

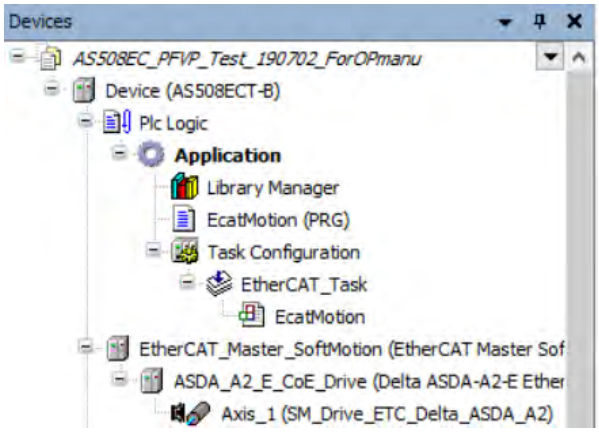
7.8.1.2 Z|*X

ò!þRi[Û5õFkRê rIò.v fE Ì ò[¥(î Û

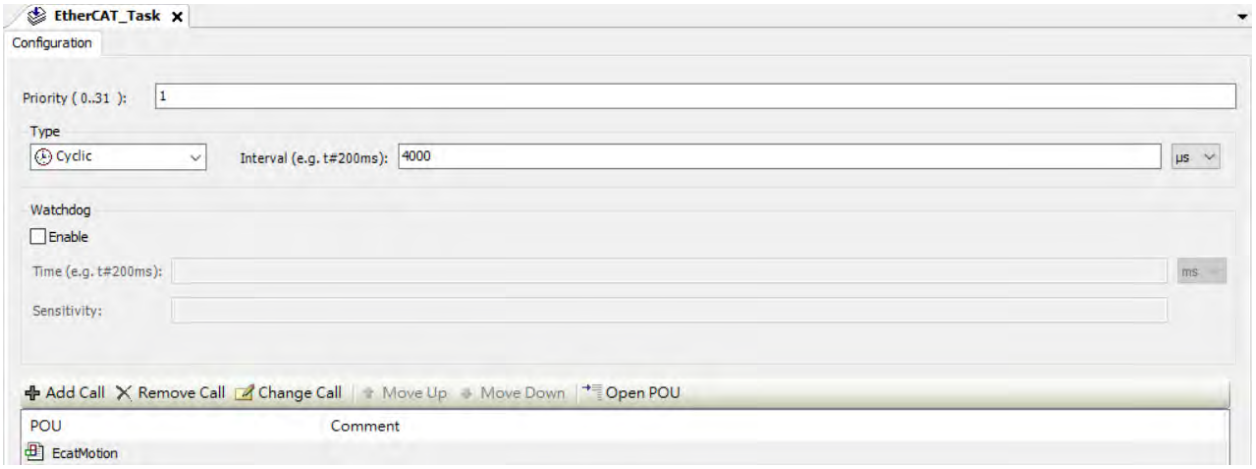
Z|'Å	ø5Ë6B0ÎQÁ I
3Ž" &O	7 Rê r fE ;K22!sK sJÇn¿[‹
_·"•3Ž" [¥+•	[Þ#©Oê;K22!sK êJÇ
!6ô#©5W	7 Rê r fE ASDA-A2-E µJÀn¿[‹#©5W •of;» ! 10000 •10000

7.8.2 &¸5êg7E¬QÁ I

Ì òRê r fE EtherCAT task !l#ó ç POU A[Ûõ ⇙' fE " Fk#¿a¶`ä ' ;K POU task !l A+Š$1#± fE ‹LD #± ST Rê r ! m5 ¦[Ûõ • POU $d#ô fE ô çQÛ Œ

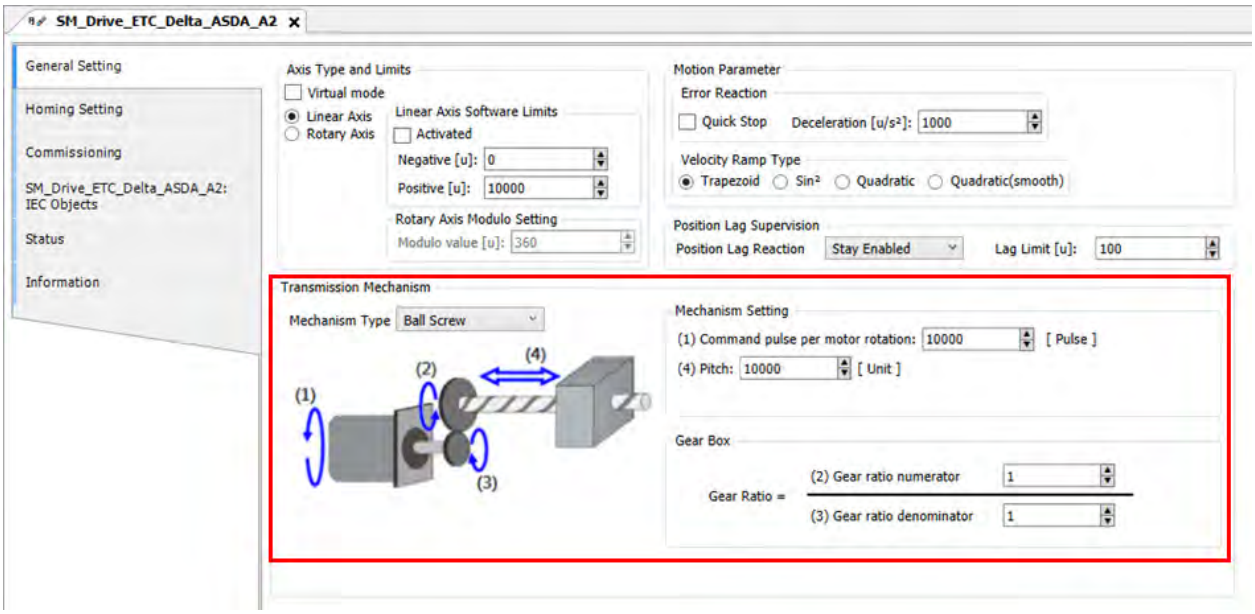


ECAT #ó;L5ÝeÛ[¥ ! 4ms



7

E +7of_U;»[¥ ! 10000 • 10000



7.8.2.1 ø5ËK¹M•Servo On

' ;KRê r •/:.áJ² EtherCAT 5W3U` [–5Ý •2NX3MC_Power ‹ Servo on Œ2î ËE 7L fPä !6ôjX"•&O Û;K Rê r3· ,8–/I&å õ ST [Ô<¼ I´ Û

HÉ-M ëCæ îEB ùX?"–`•

"ËH®	4.2,K9&I	Û(‰ ú	'Å;¦
SM_Drive_Virtual	AXIS_REF_SM3	-	VA2Æ_[#¿5W
Start	BOOL	FALSE	/:.ç$!6ô5Ý •î ! True $ "• !6ô On

7m. %¼

/: Start ! True Fk5Ý •HU[‹ EtherCAT O8NÃ6 $ ` [–;J. ?§=" •RÌ` [–;J. 5Ý" ` _® ServoOn _z!á.üQ [• MC_Power fPä •/:6ðFò" _z!á.üQ Status ! True 5Ý • !6ô Servo On Û

ST Z«;“

/: Start ! True Fk5Ý • HU[‹ EtherCAT O8NÃ6 $ ` [–;J. ?§=" •RÌ` [–;J. 5Ý" ` _® ServoOn _z!á.üQ [• MC_Power fPä •/:6ðFò" _z!á.üQ Status ! True 5Ý • !6ô Servo On Û

#ó5Ý F#Ö Ì" E F¸3ŽJ~#ÊY©+Æ#¿a¶_z!áB•/è • ôfçYhB`" +à_z!á#¿a¶$d#ô

```
IF Start THEN
        ServoOn :=TRUE;
        ELSE
        ServoOn :=FALSE;
END_IF

//MC_Power
MC_Power_0(
        Axis:= SM_Drive_Virtual,
        Enable:= ServoOn,
        bRegulatorOn:= TRUE,
        bDriveStart:= TRUE,
        Status=> ,
        bRegulatorRealState=> ,
        bDriveStartRealState=> ,
        Busy=> ,
        Error=> ,
        ErrorID=> );
```

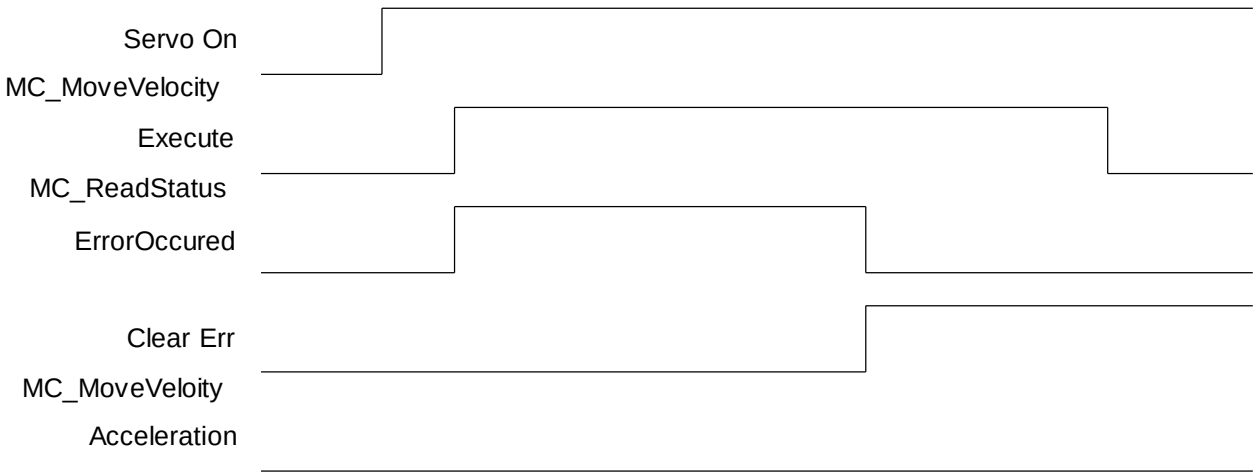
7.8.2.2 " ^2c×Z-`‹N, ÌE•2e

' ;KRê r •#Ö Ì` _®F¸3ŽXO7LF¸3Ž#¿a¶B•/èFke [Ö È0V •Ì MC_MoveVelocity _z!L.üQ "‡` .• % r •/: [¥OU ! 0 Fk5Ý • fPä Execute ! True •#¸E "†Pä'>e [Ö Error ! True û ErrorID B•/è6%I! Row Data 301 #Ö ' F¸3ŽXO" E #¿a¶7ÌFò+s5[e [Ö È0V ! SMC_MV_INVALID_ACCDEC_VALUES •7Ì2e22!s5,fƒ3yfK#õ •FÛ3Œ ` _® Execute False " True •#Ö;J. 2NX3 MC_MoveVelocity K0` _·"•"†Pä'> ÛOó MC_Reset 6 úeÏE 7L=ìfK !6ôe [Ö Û;KRê r3· ,8–/I&å õ ST [Ô<¼ I´ Û

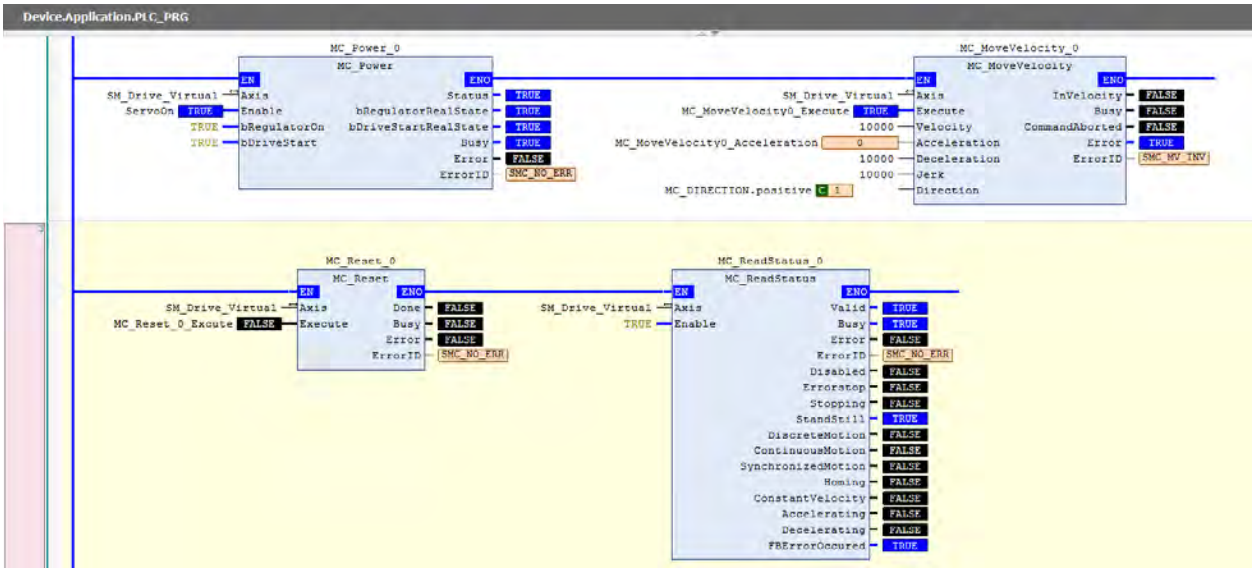
HÉ-M ëCæ îEB ùX?"–`•

"ËH®	4.2,K9&I	Û(‰ ú	'Å;¦
SM_Drive_Virtual	AXIS_REF_SM3	-	VA2Æ_[#¿5W
ServoOn	BOOL	FALSE	E 7L Enable MC_Power
MC_MoveVelocity0_Execute	BOOL	FALSE	` .•2î Ë Execute .üQ
MC_MoveVelocity0_Acceleration	LREAL	0	` .•2î Ë Acceleration .üQ •E 7L [¥+•"‡` .•
MC_DIRECTION.positive	MC_Direction	-	2î+•Iâ"•5 #ø- ;J#ø
FBErrorOccured	MC_ReadStatus	FALSE	/:"†Pä'>e [Ö5Ý.üQ ! True
ClearErr	BOOL	FALSE	/: FBErrorOccured ! True 5Ý#Ö` _®;K3Œ@ YÍ#ŞMC_ClearFBError =ì3p FB e [Ö

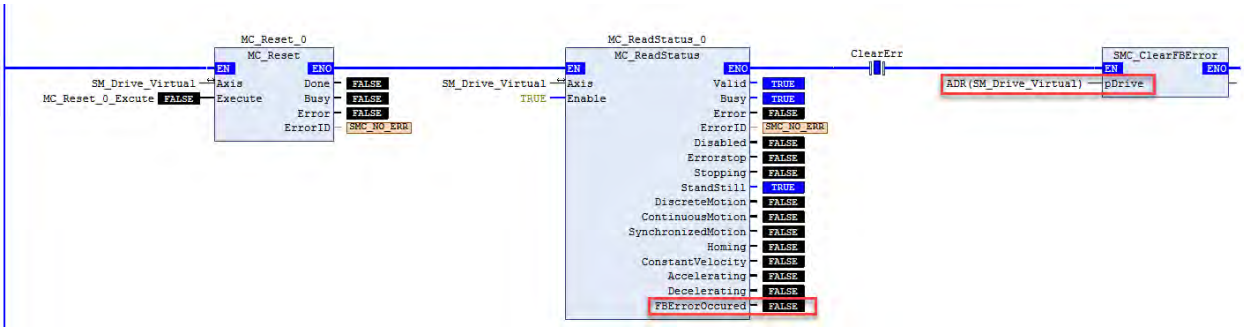
4´-M%¼



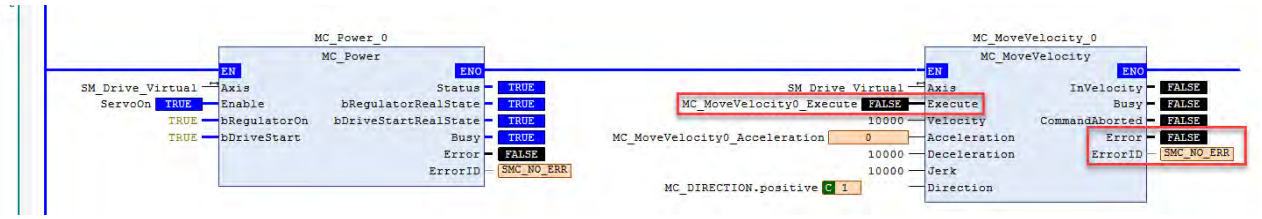
7m. %¼



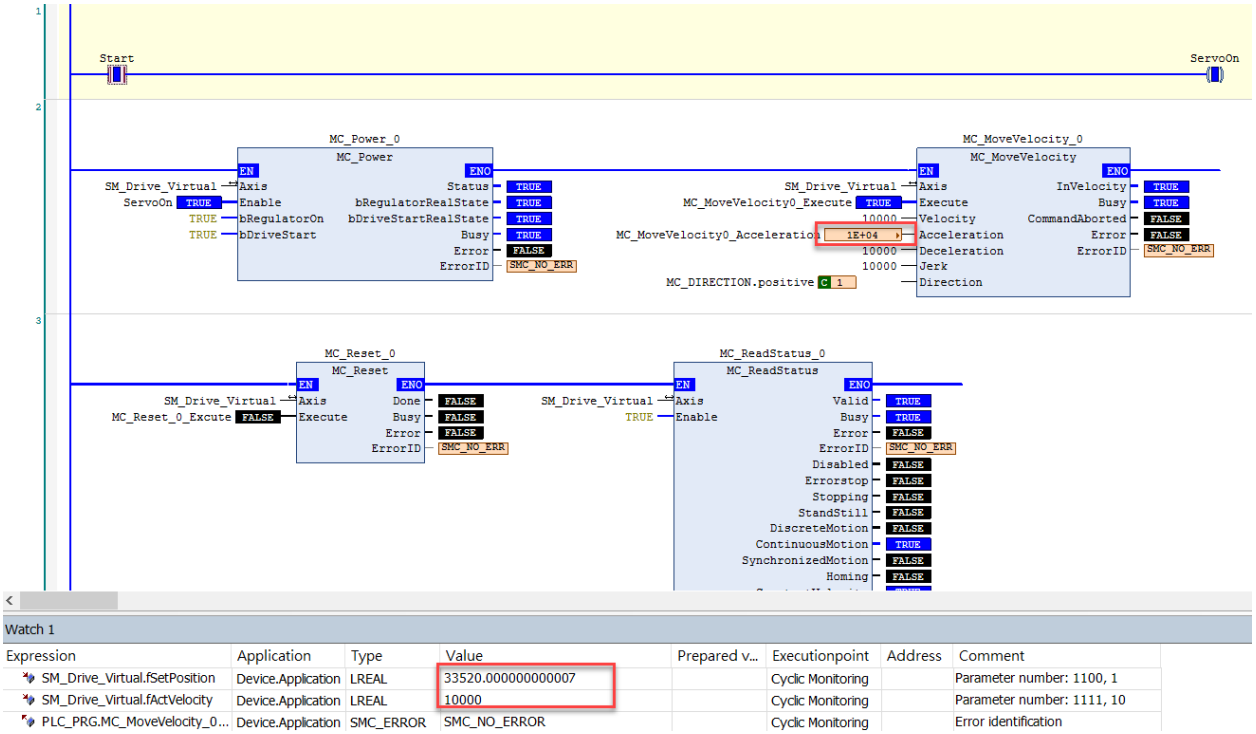
/:_·"•"†Pä'>e [Ö#¸E 5Ý •#Ö Ì` _® SMC_ClearFBError =ìfK MC_ReadStatus Fk_z!á.üQ FBErrorOccured&Ç SMC_ClearFBError _z!LfçYh` _®2îdo5 .ö _ù ²' ÌfçYh"‡ ADR‹_z!L#¿a¶ Œ E bool =ìfK FB e [Ö flag Û



#† MC_MoveVelocity #ÑYh2q_z!L.üQ Execute !ZeÔ •" _z!áe [Ö.üQ X’6Û5— Û



2q MC_MoveVelocity "‡` .• .üQ [¥ ! 10000 #õ!ta´5—$ "• Execute ! True#Ö ÌFò" "†Pä'>_z!á ! Busy ûF¸3ŽXOFkfSetVelocity õ fSetPosition `ä6ð6%I! # ÊXO;J. "• C Û



ST Z«;“

```
MC_MoveVelocity_0(
        Axis:= SM_Drive_Virtual,
        Execute:= MC_MoveVelocity0_Execute,
        Velocity:= 10000,
        Acceleration:= MC_MoveVelocity0_Acceleration,
        Deceleration:= 10000,
        Jerk:= 10000,
        Direction:= MC_DIRECTION.positive,
        InVelocity=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=>);
```

```
MC_ReadStatus_0(
        Axis:= SM_Drive_Virtual,
        Enable:= TRUE);
```

2q MC_MoveVelocity "‡` .• .üQ [¥ ! 10000 #õ!ta´5—$ "• Execute ! True#Ö ÌFò" "†Pä'>_z!á ! Busy ûF¸3ŽXOFkSetVelocity õ fSetPosition `ä6ð6%I! # ÊXO;J. "• C Û

```
MC_MoveVelocity_0(
        Axis:= SM_Drive_Virtual,
        Execute:= MC_MoveVelocity0_Execute,
        Velocity:= 10000,
        Acceleration:= MC_MoveVelocity0_Acceleration := 10000,
        Deceleration:= 10000,
        Jerk:= 10000,
        Direction:= MC_DIRECTION.positive,
        InVelocity=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=>  Œ;
```

```
MC_ReadStatus_0(
        Axis:= SM_Drive_Virtual,
        Enable:= TRUE  Œ;
```

7.8.2.3 E•2e1Å ¢c×Z-

' ;KRê r •)i7ƒ2NX3 MC_Power ‹ Servo On Œ2î Ë5Ý!áe •" ô2NX3_Â ç;L(ëCí ÛProgNext #¿a¶2îl! 6 $ #Ö Ì_Â ç;L2NX3 Û;KRê r3· ,8–/I&å õ ST [Ô<¼ I´ Û

HÉ-M ëCæ îEB ùX?"–`•

"ËH®	4.2,K9&I	Û(‰ ú	'Å;¦
SM_Drive_Virtual	AXIS_REF_SM3	-	VA2Æ_[#¿5W
ServoOn	BOOL	FALSE	E 7L Enable MC_Power
ProgNext	BOOL	FALSE	ProgNext #¿a¶2îl!6 $ #Ö Ì_Â ç;L2NX3
MC_Power_0.Status	BOOL	FALSE	B•/è ! True 5Ý •_[ÊXO-ÙN¶!-(î)dlâ"•
MC_Power_0.Busy	BOOL	FALSE	B•/è ! True 5Ý •FB 2NX3, 7 +s1÷

4´-M%¼

7m. %¼

2NX3_Â ç;L(ëCí 2"48§7Ì MC_Power 5Ý6 $ #¸E â <e [Ö Û


```
ST Z«;“
IF Start THEN
        ServoOn :=TRUE;
        ELSE
        ServoOn :=FALSE;
END_IF

IF (MC_Power_0.Status=TRUE) OR (MC_Power_0.Busy=TRUE) THEN
        ProgNext :=TRUE;
        ELSE
        ProgNext :=FALSE;
END_IF

//MC_Power
MC_Power_0(
        Axis:= SM_Drive_Virtual,
        Enable:= ServoOn,
        bRegulatorOn:= TRUE,
        bDriveStart:= TRUE,
```

```
    Status=> ,
    bRegulatorRealState=> ,
    bDriveStartRealState=> ,
    Busy=> ,
    Error=> ,
  ErrorID=> );
```

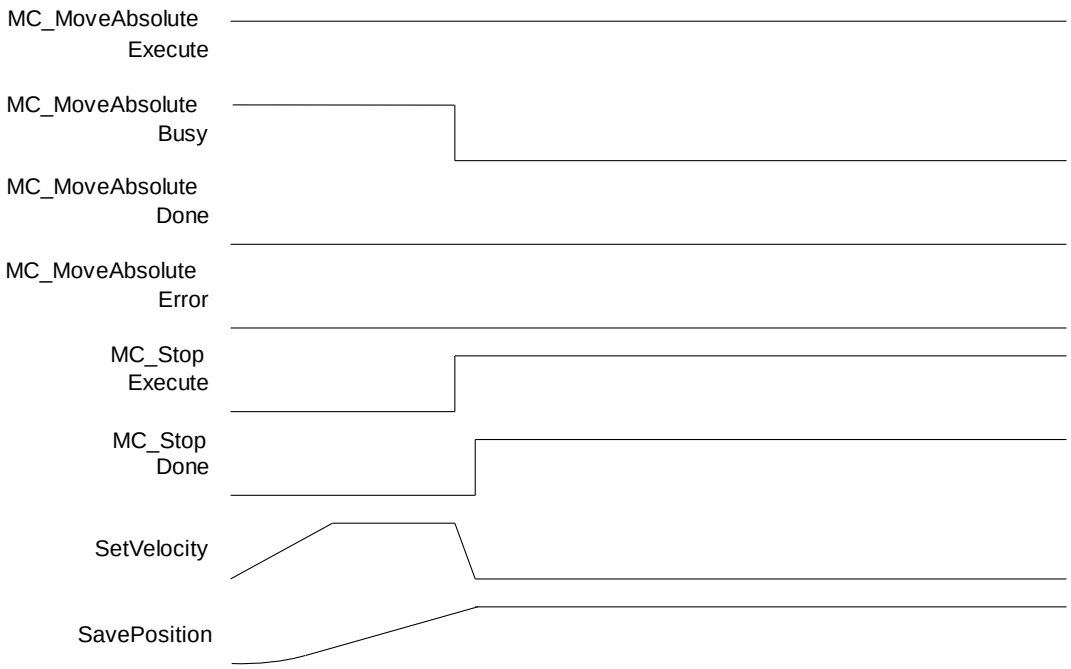
7.8.2.4 " ^23‹ I‰"1 :

' ;KRê r •2NX3 MC_MoveAbsolute‹NÄ+à+â" Œ2î Ë7 eÛ)i7ƒ6ð_b/•Fke [Ö#¸E #Ö Ì" E MC_Stop 7L C;I#<_[_·"•2î ËFk4´ C Û;KRê r3· ,8–/I&å õ ST [Ô<¼ I´ Û

HÉ-M ëCæ îEB ùX?"–`•

"ËH®	4.2,K9&I	Û(‰ ú	'Å;¦
SM_Drive_Virtual	AXIS_REF_SM3	-	VA2Æ_[#¿5W
ServoOn	BOOL	FALSE	E 7L Enable MC_Power
MC_MoveAbsolute0_Execute	BOOL	FALSE	NÄ+à+â"2î Ë Execute .üQ
MC_DIRECTION.positive	MC_Direction	-	2î+•Iâ"•5 #ø- ;J#ø ‹5²_S_[6ð5/ Œ
StopOn	BOOL	FALSE	B•/è ! True 5Ý •$ "• MC_Stop
MC_Stop_0.Done	BOOL	FALSE	B•/è ! True 5Ý •MC_Stop C;I+s1÷

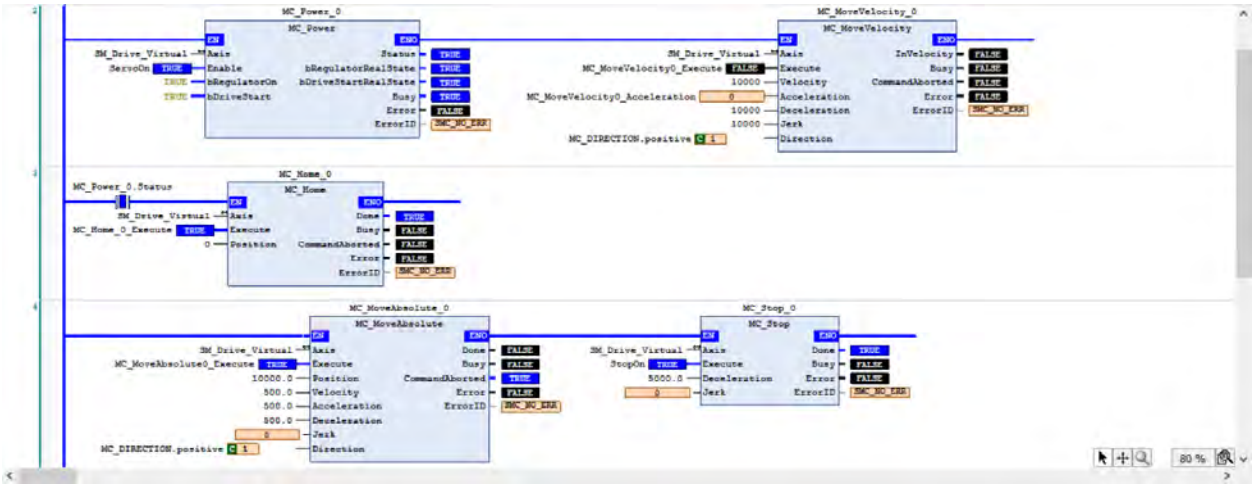
4´-M%¼



7m. %¼

HU[‹ MC_Power _z!á Status ;J. •2NX3#†@ &Å/9 •/:#†@ &Å/9+s1÷#õ •2NX3NÄ+à 4OU+• 4

‹MC_MoveAbsolute Œ;K5ÝRÌYhM 0 C;I •" 2NX3 MC_Stop •;K5ÝNÄ+à+â"-Ì CX'2:5" •_z!á.üQ CommandAborted ! True •_[„AN2'[¥OUFk!¶` .•#¢ C C;I •+s1÷M 0 C;I#õ MC_Stop _z!á.üQ Done ! True Û



ST Z«;"

"• C=(Iò#ó LD XOI! •MC_Home +s#õB•/è7!' StandStill Û

```
//MC_Power
MC_Power_0(
        Axis:= SM_Drive_Virtual,
        Enable:= ServoOn,
        bRegulatorOn:= TRUE,
        bDriveStart:= TRUE,
        Status=> ,
        bRegulatorRealState=> ,
        bDriveStartRealState=> ,
        Busy=> ,
        Error=> ,
        ErrorID=> );

//MC_Home
IF MC_Power_0.Status THEN
        MC_Home_0(
        Axis:= SM_Drive_Virtual,
        Execute:= MC_Home_0_Execute,
        Position:= 0,
        Done=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=>);
END_IF
```

2NX3NÄ+à 4OU+• 4 ‹MC_MoveAbsolute Œ;K5ÝRÌYhM 0 C;I •" 2NX3 MC_Stop •;K5ÝNÄ+à+â"-Ì CX'2: 5" •B•/è7! ' Stopping Û

```
//MC_MoveAbsolute & MC_Stop
MC_MoveAbsolute_0(
        Axis:= SM_Drive_Virtual,
        Execute:= MC_MoveAbsolute0_Execute,
        Position:= 10000.0,
        Velocity:= 500.0,
        Acceleration:= 500.0,
        Deceleration:= 500.0,
        Jerk:= ,
        Direction:= MC_DIRECTION.positive,
        Done=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=>);

        MC_Stop_0(
        Axis:= SM_Drive_Virtual,
        Execute:= StopOn,
        Deceleration:= 5000.0,
        Jerk:= ,
        Done=> ,
        Busy=> ,
        Error=> ,
        ErrorID=>);
```

7.8.2.5 "]?w%œ.

' ;KRê r •` _® #†@ &Å/92î Ë[•E 2 mYÊ)i < A#†@ &Å/9 •&Å Home : .ö#×_¥FÕ"45 2è 0-35 •E " Fk OD ! 6098‹ Homing method Œ6099sub1‹Speed during search for switch Œ6099sub2‹ Speed during search for zero Œ•[ÍN-!l+ #Ö Ì#©Oê#×_¥j¿f ‹=(!6ôjX"•&O ASDA-A2-E Lâ!þ.{E 2g7 22!s Û

Ì;KRê r ! r

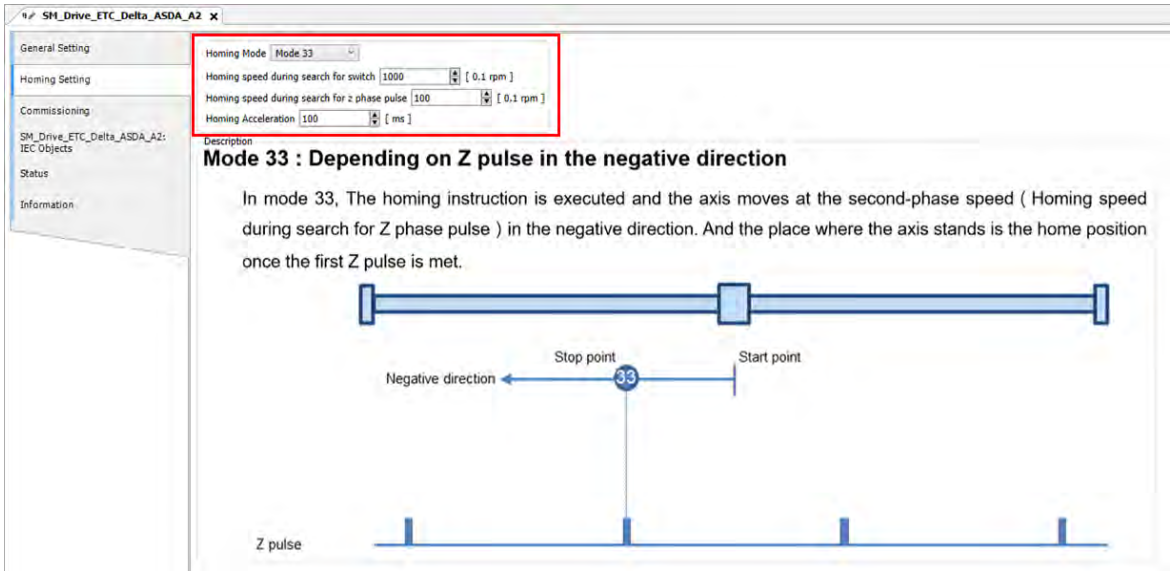
' EtherCAT slave (…"‡A2-E !6ô#õ#<!â!l+ Fk]^)²#©5W"‡!L ñ_×2'[ÛFk OD •.]NÀ o")² #

Homing method =33 ‹`. Z Pð!™_ÂX3(ô 4 Œ

Speed during search for switch =1000[#< 4 1.0rpm] ‹ Ì 100rpm ` .•+â2e7hf7.ç!Z Œ

Speed during search for zero =100[#< 4 0.1rpm] ‹ Ì 10rpm +â2efÝ@ Œ

[¥+•+s1÷#õ!t LD/ST _ð#½MC_Home ' _· CFk5Ý , +à.{ Ì ñ OD +àFß+à.{ Homing method

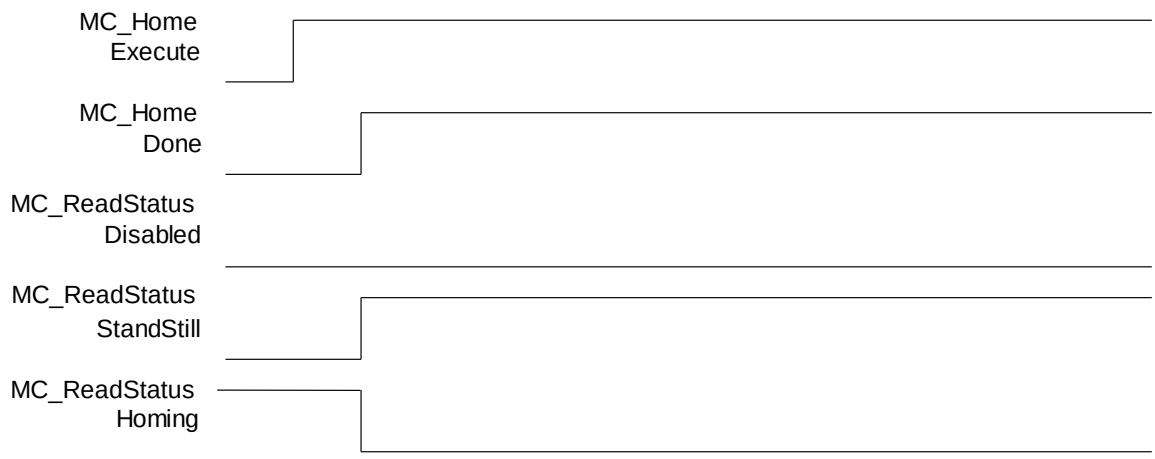


;KRê r3· ,8–/I&å õ ST [Ô<¼ I´ Û

HÉ-M ëCæ îEB ùX?`•

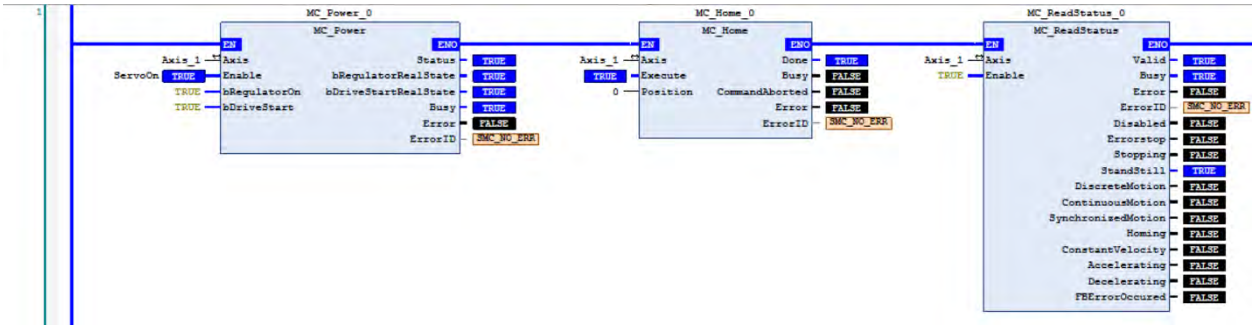
"ËH®	4.2,K9&I	Û(‰ ú	'Å;¦
Axis_1	AXIS_REF_SM3	-	+… :_[#¿a¶
ServoOn	BOOL	FALSE	E 7L Enable MC_Power

4´-M%¼



7m. %¼

HU[‹ MC_Power _z!á Status ;J. •B•/è7! ! Standstill•2NX3 MC_Home #†@ &Å/9 ¦K5ÝB•/è7! ! homing /:#†@ &Å/9+s1÷#õ •B•/è7!!î ! Standstill Û



ST Z«;“

"• C=(lò#ó LD XOI! • MC_Home +s#õB•/è7!' StandStill •_z!áB•/è#Ö" E]2 õ#¿a¶1ý6 ` _®F¸3ŽXO#¢7Ì Fò Û

```
MC_Home_0(
        Axis:= Axis_1,
        Execute:= ,
        Position:= 0,
        Done=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=> );

MC_ReadStatus_0(
        Axis:= Axis_1,
        Enable:= TRUE,
        Valid=> ,
        Busy=> ,
        Error=> ,
        ErrorID=> ,
        Disabled=> ,
        Errorstop=> ,
        Stopping=> ,
        StandStill=> ,
        DiscreteMotion=> ,
        ContinuousMotion=> ,
        SynchronizedMotion=> ,
        Homing=> ,
        ConstantVelocity=> ,
        Accelerating=> ,
        Decelerating=> ,
        FBErrorOccured=>);
```

7.8.2.6 M›*· ú*X

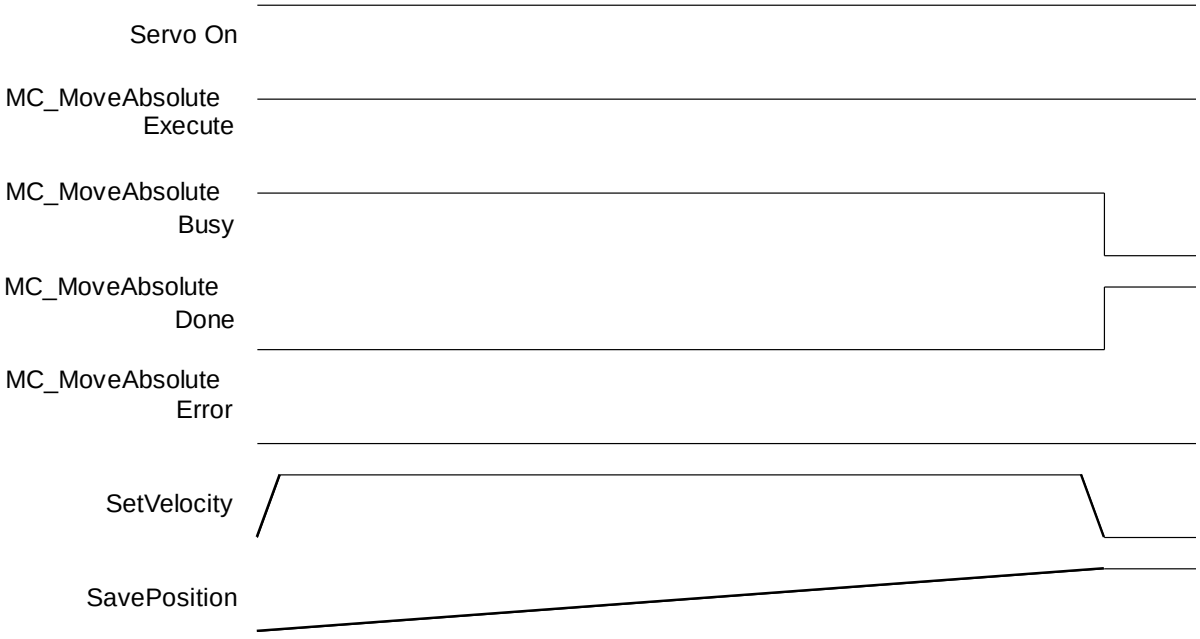
' ;KRê r •` _® NÄ+à+â"2î Ë[•E 2 mYÊ)i < A#<;œ` 4Iâ Û

;KRê r3· ,8–/I&å õ ST [Ô<¼I´

HÉ-M ëCæ îEB ùX?"–`•

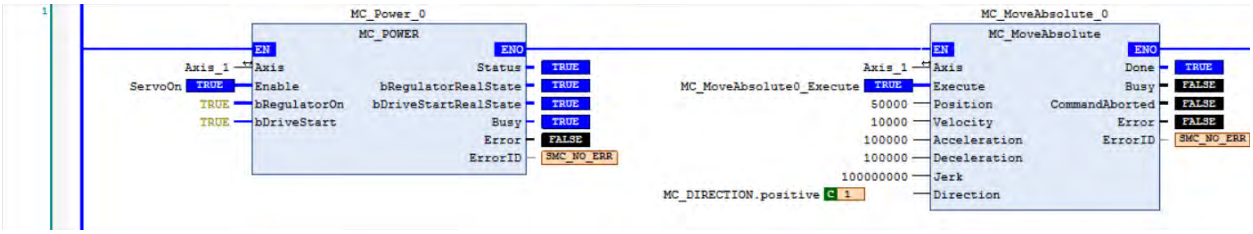
"ËH®	4.2,K9&I	Û(‰ ú	'Å;¦
Axis_1	AXIS_REF_SM3	-	+… :_[#¿a¶
ServoOn	BOOL	FALSE	E 7L Enable MC_Power
MC_MoveAbsolute0_Execute	BOOL	FALSE	NÄ+à+â"2î Ë Execute .üQ
MC_DIRECTION.positive	MC_Direction	-	2î+•Iâ"•5 #ø- ;J#ø‹5²_S_[6ð5/ Œ

4´-M%¼



7m. %¼

HU[‹ MC_Power _z!á Status ;J. •2NX3NÄ+à 4OU+• 4 ‹MC_MoveAbsolute Œ µ]^)² 4OU 0 Æ¶¥+• 4OU 50000 Û



```
ST Z«;“
MC_Home_0(
        Axis:= Axis_1,
        Execute:= ,
        Position:= 0,
        Done=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=> );

MC_MoveAbsolute_0(
        Axis:= Axis_1,
        Execute:= MC_MoveAbsolute0_Execute,
        Position:= 50000,
        Velocity:= 10000,
        Acceleration:= 100000,
        Deceleration:= 100000,
        Jerk:= 100000,
        Direction:= SM3_Basic.MC_DIRECTION.positive,
        Done=> ,
        Busy=> ,
        CommandAborted=> ,
        Error=> ,
        ErrorID=> );
```

7.8.2.7 ¶^,!f ë Å2 ¶^,W&

' ;KRê r •#Ö' 2NX3!ß_U"• CFk_®Iò !î3I!ß_UXO Û

(…"‡ " µ_[.] û.áJ² MC_CamIn 2î Ë7L+…C—!î3I !ß_UXO • !ß_U_z!áFk[¥+• a4OU ô#óFk_z!á #©5W • "_[Fk2î Ë 4OU ! 3000 Ì ò5Ý • fE CamTable1 •/:]l_® 3000 5Ý •!î3I ! CamTable2 Û

;KRê r3· ,8–/I&å õ ST [Ô<¼I´ Û

Iò.v fE Fk "Yh #¿a¶

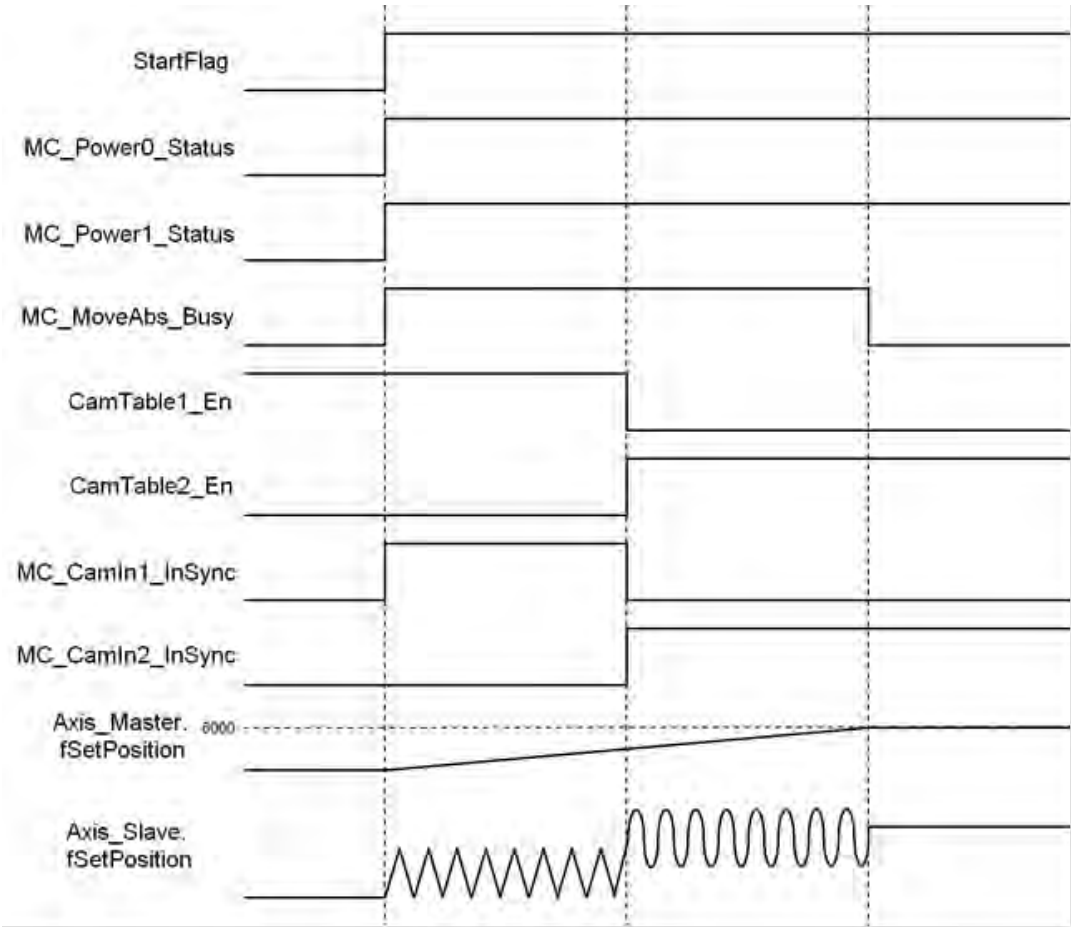
"ËH®	"–`•K9&I	Û(‰ ú	;¦`^
Axis_Master	AXIS_REF_VIRTUAL_SM3	-	"_[FkFß!Z_[#¿a¶
Axis_Slave	AXIS_REF_VIRTUAL_SM3	-	µ_[FkFß!Z_[#¿a¶
CamTable1	MC_CAM_REF	-	!ß_UXO1 Fß!Z#¿a¶
CamTable2	MC_CAM_REF	-	!ß_UXO2 Fß!Z#¿a¶
StartFlag	BOOL	FALSE	RÌ;K#¿a¶ ! TRUE û õ_[` [–;J. ¥ $ "• Servo On •.].ç)²2NX3#õNÔ"• C
MC_Power0_Status	BOOL	FALSE	"_[MC_Power _z!á Status Fk#¿a¶ Servo On 5Ý ! TRUE
MC_Power1_Status	BOOL	FALSE	µ_[MC_Power _z!á Status Fk#¿a¶ Servo On 5Ý ! TRUE

"ËH®	"–`•K9&I	Û(‰ ú	;¦`^
MC_Home0_Done	BOOL	FALSE	"_[MC_Home _z!á Done Fk#¿a¶ /:2NX3#†@ &Å/9+s1÷#õ ‼TRUE
MC_Home1_Done	BOOL	FALSE	µ_[MC_Home _z!á Done Fk#¿a¶ /:2NX3#†@ &Å/9+s1÷#õ ‼TRUE
MC_MoveAbs_Busy	BOOL	FALSE	"_[MC_MoveAbsolute _z!á Busy Fk#¿a¶ /:"†Pä'>2NX3#õ_[' "• C ! TRUE
CamTableSelect	MC_CAM_REF	-	/: ò_ð2Ð+à.{Fk!ß_UXO#¿a¶
CamTable1_En	BOOL	FALSE	+í CamTable1 C !!ß_UXO fE 5Ý ! TRUE
CamTable2_En	BOOL	FALSE	+í CamTable2 C !!ß_UXO fE 5Ý ! TRUE
CamTableID	MC_CAM_ID	-	;K !3¶_×!ß_UXOFk!l`Ï5W3UNº7k •E MC_CamTableSelect E 1÷ •.] C ! MC_CamIn Fk_z!L
MC_CamIn1_InSync	BOOL	FALSE	!ß_UXO1 Fk MC_CamIn _z!á InSync Fk#¿a¶ /: " µ_[!ß_U#ó;L5Ý ! TRUE
MC_CamIn2_InSync	BOOL	FALSE	!ß_UXO2 Fk MC_CamIn _z!á InSync Fk#¿a¶ /: " µ_[!ß_U#ó;L5Ý ! TRUE

CamTable1 •

CamTable2 •

5Ý.v&å •



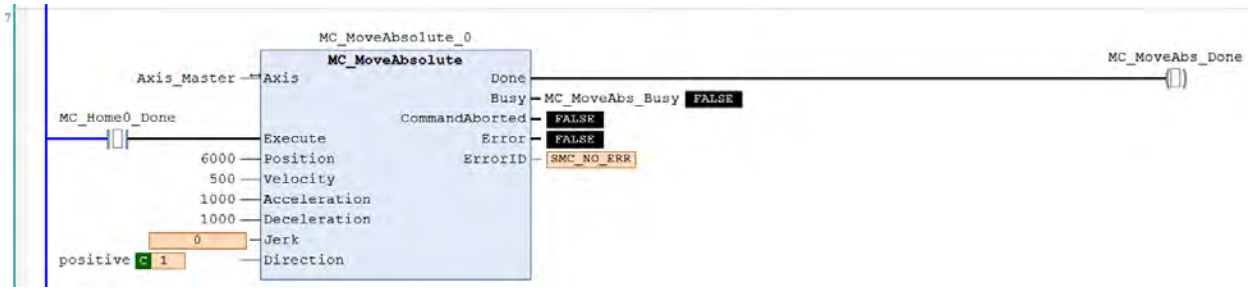
8–/l&åIò.v •

[¥+•3Œ@StartFlag ! True #õ !í" HU[‹ " µ_[Fk` [–6 $ 6ð;J. Fk2NX3 Û

RÌ' ;J. Fk0¬!œ ò • !t!í" +à " µ_[[¥+• ! Servo On B•/è Û

" µ_[! Servo On B•/è û(ë u#†@ 7 HU+•B•/è •!/2NX3 ç; #†@ &Å/9"• C Û

"_[Fk#†@ &Å/9"• C+s1÷#õ •2NX3NÄ+à+â"2î Ë ‹ MC_MoveAbsoluteŒÊ



"_[Fk2î Ë 4OU ! 3000 Ì ò5Ý • fE CamTable1 • CamTable1_En=True ÚCamTable2_En=False •/:) u 3000 5Ý •fE CamTable2 • CamTable1_En=False ÚCamTable2_En=True •4 a42î Ë MC_CamTableSelect [¥+•+à.{!ß_UXO Û

/: "_[_ÂX3NÄ+à #+• 4 û CamTable1_En=True 5Ý •2NX3!ß_UXOamTable1 Û