S700 and S300 Motion Tasking Example

- Start the DriveGUI commissioning program
- The first Window is:



To get started:

- Disable the drive (if it is enabled) using the DIS button on the top toolbar.
- Set the **OPMODE** to mode 8: Position Motion Tasks from the list box on the toolbar (far right corner).
- Open the Digital I/O window by double-clicking on Digital I/O under the DRIVE and Setup Wizard (left project tree) and feed the program with the shown data below (Note: This is not required if commands are given from the serial port).

- Configure the Digital I/O as shown below.
- Click on the "Finish" button.

🕯 🔛 🕺 🖄 🛍 X 🔤	🖨 🕄 Help	(FL) K?				+ 🗰 🗘 🗋 🔒	🧧 EN 100 🚴 🍝 RI 🛓	OPMODE 8 Position Motion Tesk
070:60 Setup Woard 	Digit	al I/O						
 CAN / Field Bus Settings Feesback 	input 1	17: Start Motion Tesk configured by BCD Select Bits	• 3		Eliver			
- W Motor - V. Current Loop - C. Velocity Loop	Input 2	9 Motion Task BCD Select Bit	•		Eliver			
 Position Loop Position Data 	Input 3	21: Jog Motor at x speed (Position Mode)	• 1000	çn	Eliver			
-ga Prostion registers 4§ Electronic Gearing 4 ₉ Encoder Emulation	Input 4	12 Machine Home (Reference) Switch	•		Eliver			
Analog10 Digital10	Input 21	0.01	•		Eliver			
Status (Errors / Warnings) Monitor	input 22	0.01	•		Eliver			
Homing Motion Tasks Oscilloscope Rode Net	Output 1	7. Within In-Position Window	• 0		Eleven			
Terminal Auto-Tuning	Output 2	16 NexHn Position reached	• 0		Eliver			
BheCAT SD-Card								
			Da	inus Fai	d n			

• The following window will pop up. Click on "Yes" Save to EEPROM & Reset Amplifier.



Next double-click on "Homing" in the left project tree under the Drive->Setup Wizard as shown below.



Configure the Homing Screen as shown below. Since Digital Input 4 was setup to be the home reference switch, mode 3: Home Switch without Zero Pulse was chosen for this example.

File Edit Communication Drive Tools	View Help				
🗅 😅 🖬 % 🖻 🛍 🗙 က 4	🗟 🕐 Help (F1) 💦	🔶 🕀 🗘	🕽 🛃 🛃 🌆 EN DIS	🔈 👗 për 🛓	OPMODE 8: Position Motion Tasks 🔹
BRIVED BRIC Setup Wizard Baic Setup Units / Mechanical CAN / Field Bus Settings Seedback Baic Setup Units / Mechanical CAN / Field Bus Settings Seedback Bot Setup Destion Loop Velocity Loop Position Data Position Data Position Data Position Registers Setup I J O Motion Service Status (Errors / Warnings) Monitor Homing "Se Motion Setup Varial Setup I J O Motion Service Status (Errors / Warnings) Monitor Homing "Se Monitor Bede Plot Bode Plot J' O Option Card	Homing Homing 3 Home Switch without Zero Pulse Homing Speed 60 gm Direction of Motion negative 0 fiset 0 counts Auto-home on Enable 0 never Zero-Pulse Source 0 Resolver or encoder zero crossing (0 - none) 0 Start on-the-fly	Start Stop Acc. Ramp 1000 rpm/s Dec. Ramp 1000 rpm/s			

Double-click on "Units/Mechanical" under the Drive->Setup Wizard project tree on the left which will show the current user units and mechanical conversion. This is application dependent but for this demonstration the following is assumed:

B DRIVEO	its / M	echan	ical				
Units / Mechanical CaN / Field Bus Settings Settings GetBuck Po Motor Current Loop Courrent Loop Settin Loop Position Data Position Data Setting Bectronic Gearing Acc Second Enveloped Position I Position	er Units sition punts locity m celeration m/s			•	, \$		
Ary Analog I/O Digital I/O Dig	Mechanical Con		version 10000 Counts				
Homing Homing Lo Motion Tasks Gosciloscope Bode Plot Arminal	5000001 -	1	Motor Revs				
Matter Tuning 							

Double-click on "Motion Task" under the project tree to call up the Motion Task window. Note for this example Motion Tasks 1 and 2 were configured. The following procedure will show how to configure these.



- Disable the drive (if it is enabled)
- To configure Motion Task 1, click on the first row of the Motion Task table to highlight and then double-click that row to call up the "Motion Task Parameters".

File Edit Communication Drive Tools	View H	elp									
🗅 🚅 🔛 👗 🗈 🛍 🗙 🗠 🖨	§ 📿 ⊦	Help (F1) 🗎				••	Ф 🖸 🖬	SI EN DIS	🚴 👗 flf	🛓 ОРМО	ODE 8: Position Motion Tasks 🔹
E DRIVEO								↑			
🖶 🏊 Setup Wizard	Mo	tion Ta	sks					Enable/Die	hla		
😥 🕒, Basic Setup								Enable/Dis			
		T		Control			Mala and	E. B. Marker			
😥 🖏 CAN / Field Bus Settings		Position /		Word			Profile	Motion	Delav	Motion	
🖏 Feedback	No.	Distance	Velocity	(Hex.)	Acc.	Dec.	No.	Task No.	Time	Туре	
😥 🐲 Motor	×	0 P	0 V	00	0 ACC	O DEC	O TAB	O FN	O FT	Type	
		10000	200	2088	500	500	0	2	250	ABS	
			1500	2088	3000	3000	0	1	250	ABS	-
🖏 Position Loop	4										
Position Data	5										
	6	-	Click here t	o highlight row 1							
		-									
🎭 Encoder Emulation	9										
A _U Analog I/O	10										
🔤 Digital I/O	11	-									
- 🖏 Motion Service	13	-									
- 🔂 Status (Errors / Warnings)	14										
-Nonitor	15										
- 🖏 Homing	16	-									
"In Motion Tasks		-									

• Use the shown values and then click on the "OK" button.

		<u> </u>	70.400	8 0
Number 1				
Trajectory / Profile trapezoidal Table / Acc. No.	• • • v_cmd	rpm		
0	Analog	-In 1		
-	· · · · ·	*		-
	Acceleration *)		Deceleration *)	12
	500 ipm/s		Juo Ipn	1/5
 Limited by the screen page 	setting "t acc/dec min" on the "Position Data"	🛛 🔽 Next Motion Task		
*) Limited by the screen page ' Motion Type	setting "t acc/dec min" on the "Position Data"	Next Motion Task	Start Condition	
*) Limited by the screen page ' Motion Type ABS	setting "t acc/dec min" on the "Position Data"	Vext Motion Task Next Number 2	Start Condition	•
") Limited by the screen page " Motion Type ABS Target Position / [setting "t acc/dec min" on the "Position Data" • •	Next Motion Task Next Number 2 Motion blending	Start Condition Time Start by I/O Edg	-
*) Limited by the screen page ' Motion Type ABS Target Position / [10000	setting "t acc/dec min" on the "Position Data" Distance / TargetPress / TargetVol	Next Motion Task Next Number 2 Motion blending a	Start Condition Time Start by I/O Edg LOW Level	ye Y
*) Limited by the screen page ' Motion Type ABS Target Position / [] 10000	setting "t acc/dec min" on the "Position Data" Distance / TargetPress / TargetVol Counts	Next Motion Task Next Number 2 Motion blending a	Start Condition Time Start by I/O Edg LOW Level Delay Time	• je
*) Limited by the screen page ' Motion Type ABS Target Position / D 10000 Units	setting "t acc/dec min" on the "Position Data" • Distance / TargetPress / TargetVol Counts	Next Motion Task Next Number 2 Motion blending • a	Start Condition Time Start by I/O Edg LOW Level Delay Time 250	• je • ms
*) Limited by the screen page ' Motion Type ABS Target Position / 0 10000 Units SI / User	setting "t acc/dec min" on the "Position Data" Distance / TargetPress / TargetVol Counts	Next Motion Task Next Number 2 Motion blending a b c c	Start Condition Time Start by I/O Edg LOW Level Delay Time 250	je To ms
*) Limited by the screen page ' Motion Type ABS Target Position / 0 10000 Units SI / User	setting "t acc/dec min" on the "Position Data" Distance / TargetPress / TargetVol Counts	Next Motion Task Next Number 2 Motion blending a b c cencel	Start Condition Time Start by I/O Edg LOW Level Delay Time 250	je ms

• Repeat the process to set the Motion Task Parameters for motion task number 2. Set the values as shown and then click on the "OK" button.

Number 2				
Trajectory / Profile		+		
trapezoidal	▼		\langle	
Table / Acc. No.	1500	rpm		
n				
	Analog-In			
-		*		
	Acceleration *)	ſ	Deceleration *)	
	3000 mm/s		3000 mm/s	
			ipinys	
*) Limited by the screen page '	setting "t acc/dec min" on the "Position Data"	Vext Motion Task	oooo ibuya	
*) Limited by the screen page ' Motion Type	setting "t acc/dec min" on the "Position Data"	✓ Next Motion Task Next Number	Start Condition	
*) Limited by the screen page ' Motion Type ABS	setting "t acc/dec min" on the "Position Data"	✓ Next Motion Task Next Number 1	Start Condition]
*) Limited by the screen page ' Motion Type ABS Target Position / D	setting "t acc/dec min" on the "Position Data"	Vext Motion Task Next Number 1 Motion blending	Start Condition Time • Start by I/O Edge]
") Limited by the screen page ' Motion Type ABS Target Position / D	setting "t acc/dec min" on the "Position Data")istance / TargetPress / TargetVol	Next Motion Task Next Number	Start Condition Time • Start by I/O Edge LOW Level •]
*) Limited by the screen page ' Motion Type ABS Target Position / 0	setting "t acc/dec min" on the "Position Data" istance / TargetPress / TargetVol Counts	Next Motion Task Next Number	Start Condition Time • Start by I/O Edge LOW Level • Delay Time]
*) Limited by the screen page ' Motion Type ABS Target Position / 0 Units	setting "t acc/dec min" on the "Position Data" istance / TargetPress / TargetVol Counts	Next Motion Task Next Number Notion blending a b	Start Condition Time Start by I/O Edge LOW Level Delay Time 250)
*) Limited by the screen page ' Motion Type ABS Target Position / 0 Units SI / User	setting "t acc/dec min" on the "Position Data" istance / TargetPress / TargetVol Counts	Next Motion Task Next Number Notion blending a b c c	Start Condition Time • Start by I/O Edge LOW Level • Delay Time 250]] ms
*) Limited by the screen page ' Motion Type ABS Target Position / 0 0 Units SI / User	setting "t acc/dec min" on the "Position Data" istance / TargetPress / TargetVol Counts	Next Motion Task Next Number Notion blending a b c c	Start Condition Time Start by I/O Edge LOW Level Delay Time 250) ms

• Now that the 2 motion tasks have been configured. Click on the "Save Motion Tasks To Drive" button.

WOTION Tasks Dubit / Methanical C.N/ Frid Boststings Feedback Neter Current Loop Velocity Loop Position Loop Position Loop Position Registers 1 0.0 1 0.00 1 0.000		ation Taska									
CAV / Field Bus Settings Feedback Motor Current Loop Velocity (Loop Velocity (Loop Veloc	up Mechanical	otion lasks									
x O_P O_V O_C O_ACC O_DEC O_TAB O_FN O_FT Type Peritin Loop 1 10000 2000 2088 5000 6 2 250 ABS Peritin Loop 2 0 1500 2088 3000 3000 0 1 250 ABS Peritin Loop 3 0 2088 3000 3000 0 1 250 ABS Peritin Loop 3 0 2088 3000 3000 0 1 250 ABS Peritin Loop 1 1000 2088 3000 3000 0 1 250 ABS Peritin Loop 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 1000 1 10000 1 10000 1 100000 1 100000 <th>eld Bus Settings k</th> <th>Target Position / lo. Distance</th> <th>Velocity</th> <th>Control Word (Hex.)</th> <th>Acc.</th> <th>Dec.</th> <th>Velocity Profile No.</th> <th>Following Motion Task No.</th> <th>Delay Time</th> <th>Motion Type</th> <th></th>	eld Bus Settings k	Target Position / lo. Distance	Velocity	Control Word (Hex.)	Acc.	Dec.	Velocity Profile No.	Following Motion Task No.	Delay Time	Motion Type	
1 10000 200 2088 500 0 2 250 ABS Portion Data 3 0 1500 2088 3000 3000 0 1 250 ABS Portion Data 3 0 1500 2088 3000 3000 0 1 250 ABS Dectron Gearing 4 1	loop	X O.P	0_V	0.0	0_ACC	O_DEC	0_TAB	0_FN	0_FT	Type	
Statis 2 0 1500 2088 3000 0 1 250 ABS Statis 4 1 1 1 1 1 Statis 5 1 </td <td>Loop</td> <td>1 10000</td> <td>200</td> <td>2088</td> <td>500</td> <td>500</td> <td>0</td> <td></td> <td>2</td> <td>250 ABS</td> <td></td>	Loop	1 10000	200	2088	500	500	0		2	250 ABS	
Podian Registers Bectonic Regist	Data	2 0	1500	2088	3000	3000	0		1	250 ABS	
Bettonic Gening Encoder Envision Analog I/O Digital I/O B B B B B B B B B B B B B B B	Registers	3									
incoder Fruidation handeng VO 7 Jojatal VO information terrers / Warningt) terrers / Warningt) terrers / Warningt) terrers / Warningt) 10 10 10 10 10 10 10 10 10 10	c Gearing	4									
hadiog 1/0 jost 1/0 ion Service sc (Eres: Varming) tér ing ing inf Task liscope e Plet ning 12 14 15 16 16 17 14 15 16 16 17 16 17 10 10 10 10 10 10 10 10 10 10	Emulation	5									
Actually running: 0 View ing 0 10 0 11 0 12 0 13 0 15 0 16 0 17 0 r 0 Care 0 Stat Number Stat Number Stat 1 Edit Actually running: Stat Number Stat 1 Edit Actually running: Stat 1 Edit Actually running: Toring 0 Clear all Motion Tasks 0 Clear all Motion Tasks 0	10	6							-	_	
ion Service is forest / Varning) is forest	0	/								-	
sk (thres, Ywannig) titer titer ting tor Tasks Torling CfAT Funning CfAT Reload Motion Task Table from Drive Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks to Drive	ice	0								_	
ter ining inining ining ining ining ining ining ining ining ining in	(/ Warnings)	10									
Initial Initial		11									
13 13 Bicope 14 Piot 15 14 15 15 16 16 17 17 16 18 16 19 16 10 16 11 16 12 17 13 16 14 15 15 16 16 17 17 17 18 17 19 16 10 17 10 17 11 16 12 17 13 16 13 16 14 15 15 16 16 17 17 17 18 17 19 18 10 17 10 17 11 18 12 17 13 18 14 19 10 17 11 17 12 17 13 18 14 18 10 17 10		12							-		
Plot initial Plotaniag rCAT		13									
initial proving CAT Fard Motion Task General Settings a max v max (pos) v max (pos) v max (pos) rpm 500 r Reload Motion Task Table from Drive Seve Motion Tasks to Drive Clear all Motion Tasks	1	14									
-Tuning -Tuni		15									
rCAT terd	9	16									
Cerd r General Settings Motion Task General Settings Start Number Stop 1 Edit Actually running: Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks		17									+
Motion Task General Settings Start Number Stop 1 Edit. Actually running: none 5595 rpn 500 Reload Motion Task Table from Drive Save Motion Tasks to Drive	1									,	
Motion Task General Settings Start Number a max v max (pos.) v max (neg.) Stop 1 Edit. Actually running: none 5595 rpn 500 rpm Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks											
Start Number a max v max (pos.) v max (pos.) v max (neg.) Stop 1 Edit Actually running: none 5595 rpn 500 rpm 500 r Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks	Mc	otion Task				G	oneral Settings				
Start Number a max vmax(pos) vmax(neg) Stop 1 Edit Actually running: none 5595 rpn 500 r Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks							anera deningo				
Stop 1 Edit. Actually running: none 5595 rpn 500 rpm Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks		Start Numb	er			0	max	v max (pos.)	1 01	nax (neg.)	
Reload Motion Task Table from Drive Serve Motion Tasks to Drive Clear all Motion Tasks		Stop 1	Edit	. Actually	running: none	Ę	5595 rpr	n 500	rpm 50	0 rpm	
Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks											
Reload Motion Task Table from Drive Save Motion Tasks to Drive Clear all Motion Tasks				-							
	P	Reload Motion Task Tab	le from Drive		Save Motion	Tasks to Drive			Clear all Mo	otion Tasks	
				-							_

To permanently save the data to the EEPROM and reset the drive use the "Save To EEPROM" button and then the "Reset" button on the top toolbar in the DriveGUI.

🖉 Untitled - DriveGUI	1 2 2 2	
File Edit Communication Drive Tools	View Help	
🗅 🚅 🖬 🗼 🖻 🛍 🗙 🗠 🌢	🗿 🕜 Help (F1) 💦	🔶 🕪 🗘 😰 🛃 🥨 EN DIS 놇 🍝 隆 🛓 🛛 OPMODE 🛽 B: Position Motion Tasks 🔷
	Motion Tasks	Save To EEPROM Reset

- Set the digital I/O's to low level
- Enable the drive (hardware and software). Assuming everything is healthy, the bottom toolbar should show the current status:
 - Online
 - Enabled
 - OK
 - Not Homed

D Untitled - DriveGUI							
File Edit Communication Drive Tools	View Help						
🗅 🖆 📮 % 🖻 🛍 🗙 い	🎒 🛛 🖓 Help (F1) 📢		🔶 🕩 🗘 🔮	ð 🗗	🎯 EN DIS 🚴 👗 않는 🛓	OPMODE 8: Positio	n Motion Tasks 👻
□-■ DRIVE0 □-▲ Setup Wizard □-□, Basic Setup	Digital I/O						
. CAN / Field Bus Settings	Input 1 17: Start Motion Task configured b	y BCD Select Bits 🔹 🔻	0		Invert		
Feedback Motor	Input 2 9: Motion Task BCD Select Bit	•	0		Invert		
Current Loop 	Input 3 20: Jog Motor at x speed (Position	Mode) 🔹	1000	rpm	Invert		
−C Position Loop −Q ² Position Loop −Q ² Position Registers −Q ² Electronic Gearing −S ₀ Encoder Emulation −A ₁ Analog I/O □□ Digital I/O	Input 4 12: Machine Home (Reference) Sv	vitch •	0		Invert		
 Motion Service Status (Errors / Warnings) 	Output 1 7: Within In-Position Window	•	0		Invert		
Monitor Homing Motion Tasks Oscilloscope Bode Plot Dreminal VO Option Card	Output 2 16: Next-In Position reached	•]	0		🗖 Invet		
			< Previous	Fi	nich >>		
Ready	,	S303 (DRIVE0) @ COM2 (38,4 k	:Baud)	Or	nline Enabled 🥝 O.K.	not homed	

- Control the drive by the digital IO. The following chart summarizes the states of each function.
- To demonstrate, there are 6 steps beginning with jogging, then homing, and finally executing the motion tasks.

	DIGITAL-IN	DIGITAL-	PSTOP	NSTOP	comment					
	1	IN 2								
Step	17: Start_MT	9:	20 Start_Jog v	12: Reference	Function of this dig.IO					
	ΙΟ	MT_No_Bit	=x							
1	Low	Low	Low	Low	All Digital Inputs are off					
2	Low	Low	High	Low	Start Jogging (1000 rpm)					
3	Low	Low	Low	Low	Stop Jogging					
4	High	Low	Low	Low	Start Homing (=Motion Task with					
					the No. 0)					
5	High	Low	Low	High	Activate the Home Switch, now the					
		motor will stop and the reference								
		point is set.								
6	Low	LowLowLowTurn all inputs off after homing.								
7	Low	High	Low	Low	Select Motion Task No. 1 (2^0)					
8	HighHowLowStart Motion Task No. 1									
	The motor runs from position 0 to 10000 counts (1 revolutions) at 200 rpm, decelerates to zero,									
	has a dwell from 0.250 second and starts Motion Task 2. It turns anticlockwise back to position									
	0.0 counts at 1500 rpm.									
	The DIGO	UT 1 (INPOS)	is low, if the actu	al position is outsi	de the In_Position window range.					
	The DIGO	UT 2 (Next-IN	NPOS) is low, wh	ile Motion Task 1	is active and high after the start of					
	Task 2									

- Operating the S700 in Serial Positioning from serial commands
- MH (serial command to start homing)
- Motion task higher than 200 can be changed without rebooting by coldstarting the drive information is saved in the RAM, below 201 are saved in the Eeprom.
- Move is the serial command that starts a move from the motion task table . Example (Move 1) Starts Motion Task no. 1
- What is an Order?
- An Order is the serial command for the Motion Task . The Order below has the same information as in the Motion Task table below.
- ORDER 1 10000 200 8328 500 500 -1 2 250



- ORDER 1 10000 200 8328 500 500 -1 2 250
- Motion task 201 and higher are saved in the RAM and can be changed on the fly without rebooting.

Commands:

MTMUX The MTMUX command defines the motion task that is being changed with the commands

- O_P The O_P command is used to define the target position for motion task
- O_V The O_V command defines the target speed for motion task
- O_C The O_C command defines the type of motion task, Example (Absolute Move
- O_ACC The command O_ACC can be used to define the acceleration ramp for motion task
- O_DEC The command O_DEC can be used to define the deceleration ramp for motion task
- O_FT The command O_FT is used to delay the start of the next motion task. (Units ms)
- O_FN The command O_FN is used to define the motion task to follow the current motion block

Refer to ASCII Object Reference for more parameter details

This is an example of how to modify a RAM type motion task parameter value:

In this example the position counts and the velocity were changed in Motion Task 201



This example was done in the Terminal screen of the DriveGUI

```
--> ORDER 201
201 10000 200 8328 500 500 0 -1 2 250
--> MTMUX 201
--> O_P 5000
--> O_V 1000
--> ORDER 201
201 5000 1000 8328 500 500 0 -1 2 250
-->
```