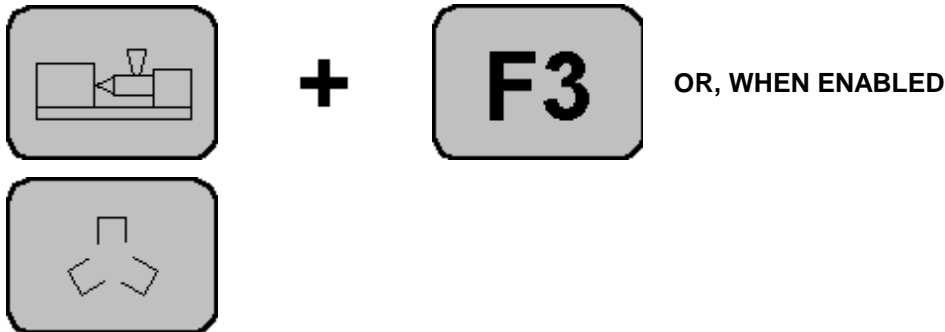


FREELY PROGRAMMABLE CORES



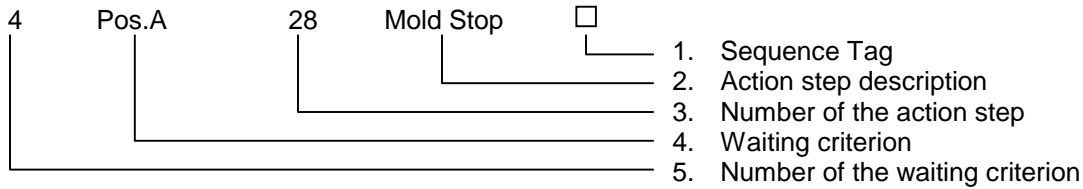
CORE SEQUENCE SET-UP				2000-04-12 11:22						
		MOLD CLOSING	0	1	MOLD OPENING	<input type="checkbox"/>	1			
4	Pos. A	28	Mold stop	<input type="checkbox"/>	4	Pos. A	11	Core 1 out at int.stop	<input type="checkbox"/>	2
2	->	2	Core 1 in	<input type="checkbox"/>	1	//	13	Core 2 out at int.stop	<input type="checkbox"/>	3
2	->	4	Core 2 in	<input type="checkbox"/>	3	=>	15	Core 3 out at int.stop	<input type="checkbox"/>	4
2	->	7	Core 3 in at int. stop	<input type="checkbox"/>	2	->	23	Time 2	<input type="checkbox"/>	5
2	->	22	Time 1	<input type="checkbox"/>	2	->	10	Core 1 out	<input type="checkbox"/>	6
2	->	6	Core 3 in	<input type="checkbox"/>	2	->	12	Core 2 out	<input type="checkbox"/>	7
0		29	Continue mold movement	<input type="checkbox"/>	2	->	14	Core 3 out	<input type="checkbox"/>	8
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	9
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	10
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	11
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	12
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	13
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	14
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	15
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	16
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	17
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	18
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	19
0		0		<input type="checkbox"/>	0		0		<input type="checkbox"/>	20
STARTED		>>> Core 1 in		NEXT MOVEMENT >						21
SEQ. CONTROL:		ACTIVE								22
		PROG. INTERRUPTION 1		LIST PROGRAMS		LIST START POINT		e t c		
								-->		
scablauf.ec		Screen View! - Version V2.08f								

This optional core-pull program allows the user to set the sequences of core movements during opening and closing of the mold. In its current implementation, ten core pulls are allowed. The selection to determine whether the standard core program is used or the freely programmable cores is located on the screen page PROGRAM SWITCHES.

The sequence of movement is described on this page using a semi-verbal description of the movement. As each number is entered for the selection, its appropriate text is displayed to the right, making it easy for the operator to determine the desired sequence. Up to 36 program steps may be entered, 18 each during mold opening or mold closing. In order to enter a value on this page, the machine must be in SETUP mode. This is in order to prevent an unintended program sequence change. Also, at least the minimum customer service level password must be entered. Finally, the manual / auto switch must be in manual mode.

When this program is purchased, the optional program AUTOMATIC CORE JUMPERING is included.

Parameter Description:



1. Sequence tag: This is activated when the action to be carried out in this line is completed. This enables the operator to determine the progress of the core pull sequence.
2. Action step description: This plain language text is based on the number of the action step (item 3).
3. Number of the action step: This is the code number of the action to be carried out.
4. Waiting criterion: This plain language text is based on the number of the waiting criterion (item 5).
5. Number of the waiting criterion: This is the code number of the waiting criterion.

For each action step a waiting criterion and the action to be carried out must be entered. The input codes for the waiting criterion and action step can occur either by:

- a) Direct numerical input using the number keys. The numbers of all possible waiting criteria can be view on screen by selecting LIST PROGRAMS (F4) and LIST START POINT (F5). The operator will be blocked from entering a waiting point that is invalid because it makes no sense.
- b) "Paging through" the possibilities using the '+' and '-' keys. When the cursor is over top a set value for a waiting point or action step, the set value may be changed using the INCREMENT or DECREMENT keys. Values whose entry does not make sense are skipped over.

EXPLANATION OF THE DIFFERENT WAITING CRITERIA

START POINT LIST				2000-04-12 12 01
0	....	Empty line - no function	
1	....	// Movement in parallel to prior step	
2	....	-> Last prior step must be completed	
3	....	=> All prior steps must be completed	
4	....	Mold position 'A' must be reached	
5	....	Mold position 'B' must be reached - Mold closed and clamping force at DS machine	
6	....	Mold position 'B8' must be reached - Toggle lever position at toggle lever machines - Mold closed and no clamping pressure at direct-closing machines	
7	....	Position KS1 must be reached (mold closing direction)	
8	....	Position KS2 must be reached (mold closing direction)	
9	....	Position KS3 must be reached (mold closing direction)	
10	....	Position KO1 must be reached (mold opening direction)	
11	....	Position KO2 must be reached (mold opening direction)	
12	....	Position KO3 must be reached (mold opening direction)	
13	....	Start of injection	
14	....	Start of injection hold pressure	
15	....	Start of cooling time	
22	....	Screw position unit 1	

PROG. INTERRUPTION 1						
SEQUENCE SET-UP	LIST PROGRAMS	LIST START POINT				

sck_wl.ec Screen View! - Version V2.08f

The possible choices for waiting criteria can be viewed on the START POINT LIST screen page.

- 0 **Empty Line:** This line has no effect on the movement sequence
- 1 **// Parallel movement:** This waiting criterion indicates that the action step on this line is carried begun at the same time as the action step in the preceding line.
- 2 **-> Immediate sequence:** The action step on this line begins immediately after the action step on the previous line is completed.
- 3 **=> Absolute sequence movement:** This waiting point means that the action step is carried out after finishing all movements in any preceding line.
- 4-12 **Stroke positions:** These stroke positions are available with the restriction that the KSx positions can only be used during the closing movement, and the Kox positions can only be used during the opening movement.
- 13 **Start of injection:** When this waiting point is chosen, the core action is started at the beginning of injection. This function is only possible when some provision is made for parallel core movement, such as an accumulator, additional pump, or air powered cores.
- 14 **Start of hold pressure:** The core action on this line will begin when the inject changes from injection boost to injection hold pressure. Like waiting point 13, this requires some provision for parallel core operation.
- 15 **Start cooling time:** The core movement begins at the beginning of cooling time.
- 22 **Screw position:** When this waiting criterion is chosen, the core action is started when reaching the set screw position (selectable on the injection boost page).

EXPLANATION OF THE DIFFERENT ACTION STEPS

The different action steps which can be chosen are listed below. Note that not all steps may make sense, such as moving core 9 on a machine equipped with only 4 cores.

- 0 **Empty line:** No function
- 1 **Mold opening:** At this point in the program, the mold opening begins. This cannot be directly entered by entering the number directly, but must be entered using the soft key SET START MOLD OPEN (F3). The mold opening sequence begins at the start of injection (as an example, for core movement during injection) but the actual motion of the mold does not begin until this point.
- 2-17,61-88 **Core movements:** These movements can be entered in any order. Shaking movements can be entered by setting the core to move in and out several times in succession. By setting a core to move to an intermediate position (either by time or limit switch) and immediately continue moving to the end position, a 2-stage core profile can be created.
- 18-21 **Ejector Movement:** If an ejector movement is listed here, the standard ejector program is automatically disabled. Instead, the ejector moves as set by the core sequencing. In either case, the standard ejector start position A1 must be reached in order to move the ejector forward, but this can be set to zero by setting the program switch DE-ACTIVATE EJECTOR SAFETIES FOR L1,A1 to YES. If the ejector is not listed in the program list, the standard ejector program is used (ejector movement after all cores are completed). In both cases, the 2-stage speed profile entered on the ejector page is used to control the ejector movement.
- 22-27 **Times 1 to 6:** There are six different delay times which can be used throughout the cycle. Each may be used only once during opening, and one more time during closing (not twice during opening, or twice during closing).
- 28 **Mold stop:** This instruction is used to determine whether a core movement occurs parallel to the mold movement, or whether the mold stops during the core movement. This step can be set on a position or after another movement (including delay times). Upon reaching this step, the mold is stopped until the program line CONTINUE MOLD MOVEMENT is reached.
- 29 **Continue mold movement:** This instruction cancels the MOLD STOP instruction, and starts the mold moving again. If the mold is stopped without this instruction being entered, the error message CORE SETTING is displayed.

Software Engineer: EUS/PE	Date: 040429	Filename: G:\!PCFS!\Suppliers!\Engel\Software\freely_programmable_core s.doc	Page: 3 of 3
---------------------------	-----------------	--	--------------

- 30-31 Air Valves:** This instruction starts the respective air valve sequence. The blowing delay time and the blowing time defined on the standard air valve page are still used, but not the start criteria on the air valve page. When a sequence is selected here, the function on the air valve page is set to 6 automatically.
- 32-33 Injection:** This line starts the injection sequence, beginning with injection boost.
- 34-35 Build up / relieve clamping pressure:** Clamp pressure is built up or released, but the mold position remains at zero.
- 36 Start rotary table:** With this selection, the rotary table turns to it's next position. All speeds, pressures, and positions are set on the rotary table page.
- 49 Safety gate open:** The movement of the safety gate opening is begun.
- 90 Open to pos KO4:** The mold is opened to the position to move the cores between injections. This is only used on a machine with more than one injection unit.

EXPLANATION OF PROGRAM SEQUENCE FIGURE 1

Mold closing movement:

- At position the mold stop is set. Therefore the mold does not begin moving immediately.
- Cores 1 moves, then core 2 moves because of the waiting criterion ->
- Core 3 moves to its intermediate stop position be cause of the waiting criterion ->
- After time delay 1 expires (->), core 3 moves to its end position.
- After core 3 is finishes moving in (->), mold closing movement begins

Injection, cooling time

These run automatically in parallel to the core sequence and are not required to be entered.

Mold opening movement:

- The mold opens to position A
- When reaching the A position, core 1 moves to its intermediate stop position. At the same time (//) core 2 moves to its intermediate stop position.
- After core 1 and core 2 both reached their intermediate stop positions (=> means all preceding steps must be completed) core 3 moves out to its intermediate stop position.
- After core 3 (->) is on the intermediate stop position, delay time 2 is started.
- After time 2 expires, core 1 moves out to its end position.
- After core 1 is fully out (->), cores 2 and 3 move out in parallel to each other (//) to their fully out positions.

PROGRAM SWITCHES



PROGRAM SWITCHES							2000-04-12 13 48	1	
PROGRAM CHOICE:							1 freely programmable	2	
Use:								3	
MOVING IN								4	
	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5		5		
Move to intermediate stop by	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.		6		
Move to end position by	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.		7		
Use auxiliary power supply	NO	NO	NO	NO	NO		8		
Valve off after moving	NO	NO	NO	NO	NO		9		
MOVING OUT								10	
	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5		11		
Move to intermediate stop by	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.		12		
Move to end position by	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.	LIM.SW.		13		
Use auxiliary power supply	NO	NO	NO	NO	NO		14		
Force at the end of moving in	NO	NO	NO	NO	NO		15		
De-activate ejector safeties for A1, L1							NO	16	
Active ejector for robot:							0 Ejector 1	17	
								18	
								19	
								20	
								21	
								22	
IGNORE CORE INTERLOCKS IN SET-UP MODE							NO		
			PROG. INTERRUPTION	1					
SEQUENCE SET-UP	PROGRAM SWITCHES	PROGRAM SWITCHES 2	SPEED & PRESSURES	SPEED & PRESSURES 2	TIMES & SIGNALS	TIMES & SIGNALS 2	etc	-->	
sck_pr.ec Screen View! - Version V2.08f									

On this screen page all program switches for cores 1 through 5 are summarized. There are no program switches for switching off and on individual cores. A core is switched on when it appears in the program list on the CORE SEQUENCE SETUP page. If a core is not listed there, that means that it is switched off and both end position switches of that core must be jumpered to +24V.

EXPLANATION OF THE DIFFERENT PROGRAM SWITCHES

- 2 **Program Choice:** Here either the standard core programs, or the freely programmable cores may be selected.
- 3 **Use:** On this line, 10 characters of text may be entered for each core as a description for the operator. This has no effect on core operation.
- 6,7,12,13 **Move to position by:** These lines determine whether the core moves until a limit switch is activated, or until a set amount of time has elapsed.
- 8,14 **Use auxiliary power supply:** These lines determine whether the cores are supplied hydraulically by the machine or externally (electrically, pneumatically, accumulator, etc.)
- 9 **Valve off after moving:** When this is set to NO, the core valve will remain on after the core reaches the fully in end position. It should be noted that this may require the usage of a pump to keep pressure on the core. The core valve will turn off again when the core out movement is begun.

- 15 **Force at end of moving in:** This switch is often used when a core is activated only to move it in, and the outward movement occurs automatically. If set to YES, the control does not set an error even though the end position input does not remain at +24V.
- 17 **De-activate ejector safeties for A1, L1:** In the standard software the values of A1 (mold position to start ejection) and L1 (Ejector forward position) are limited so the ejector will not hit the fixed platen. On some applications it is required to override these safety checks, and this can be done using the program switch on this line. If this switch is set to YES, A1 can be reduced to zero, and L1 can be increased up to the maximum ejector stroke.
- 18 **Active ejector for robot:** This line is only displayed on machine with a robot installed. With this selection, it is possible to choose which core or ejector the robot controls as the ejector, as well as which core/ejector end positions are reported to the robot as ejector positions.
- 22 **Ignore core interlocks in setup mode:** In setup mode it is possible to move the cores and mold opening even though the core safeties would normally not allow it. This is useful when initially setting up the machine.

SPEEDS AND PRESSURES



SPEED / PRESSURE							2000-04-12 14 26
Use:	0	0					
M O V I N G I N							
	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5		
Speed to intermediate pos.	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	%	
Speed to end position	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	%	
Press. to intermediate pos.	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	%	
Pressure to end position	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	%	
M O V I N G O U T							
	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5		
Speed to intermediate pos.	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	%	
Speed to end position	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	%	
Press. to intermediate pos.	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	%	
Pressure to end position	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	0.0 <input type="checkbox"/>	%	
SEQUENCE SET-UP	PROGRAM SWITCHES	PROGRAM SWITCHES 2	SPEED & PRESSURES	SPEED & PRESSURES 2	TIMES & SIGNALS	TIMES & SIGNALS 2	e t c -->
sck_pq.ec							Screen View! - Version V2.08f

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

This page contains a summary of the speeds and pressures for the core movements. Separate speeds and pressures can be used when moving to the intermediate position, and different settings when moving to the final end position. When several cores move in parallel, only the screen markers will be activated which are actually outputted to the valves.

TIMES AND SIGNALS



TIMES AND SIGNALS						2000-04-12 14:35
Use:	0	0				
M O V I N G I N	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5	
Time to intermed. stop	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	s
Time to end position	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	s
Monitoring time	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	s
M O V I N G O U T	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5	
Time to intermed. stop	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	s
Time to end position	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	s
Monitoring time	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	0.0 <input type="text"/>	s
SELECTABLE DELAY TIMES:						
Time 1 =	0.0 <input type="text"/>	Time 2 =	0.0 <input type="text"/>	Time 3 =	0.0 <input type="text"/>	s
Time 4 =	0.0 <input type="text"/>	Time 5 =	0.0 <input type="text"/>	Time 6 =	0.0 <input type="text"/>	s
	CORE 1	CORE 2	CORE 3	CORE 4	CORE 5	
off	E14 <input type="checkbox"/>	E16 <input type="checkbox"/>	E18 <input type="checkbox"/>	E20 <input type="checkbox"/>	B160 <input type="checkbox"/>	S138
Interm. stop	E14.1 <input type="checkbox"/>	E16.1 <input type="checkbox"/>	E18.1 <input type="checkbox"/>	E20.1 <input type="checkbox"/>	E22.1 <input type="checkbox"/>	SAW <input type="checkbox"/>
on	E15 <input type="checkbox"/>	E17 <input type="checkbox"/>	E19 <input type="checkbox"/>	E21 <input type="checkbox"/>	B161 <input type="checkbox"/>	S139
Interm. stop	E15.1 <input type="checkbox"/>	E17.1 <input type="checkbox"/>	E19.1 <input type="checkbox"/>	E21.1 <input type="checkbox"/>	E23.1 <input type="checkbox"/>	SP1 <input type="checkbox"/>
Status	deact.	deact.	deact.	deact.	deact.	
PROG. INTERRUPTION 1						
SEQUENCE SET-UP	PROGRAM SWITCHES	PROGRAM SWITCHES 2	SPEED & PRESSURES	SPEED & PRESSURES 2	TIMES & SIGNALS	TIMES & SIGNALS 2
sck_ti.ec			Screen View! - Version V2.08f			

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22

On the two TIMES AND SIGNALS pages all the times related to core movements are set. In addition, the statuses of the core limit switches are displayed.

EXPLANATION OF THE DIFFERENT TIMES AND SIGNALS

- 4,8 Time to intermed. Stop:** When the cores are moved to an intermediate stop position as a function of time, the duration of the movement to that position is set here. After the expiration of this time the core is considered to be at the intermediate stop position. These times must be adjusted relative to the core speeds and pressures to ensure that the core is stopping at the correct position. If one of the times is changed, the core is no longer considered at the intermediate position and must be moved again using the manual pushbutton. In order to make this easier, the program switch IGNORE CORE INTERLOCKS IN SETUP MODE can be used.
- 5,9 Time to end position:** When the cores are moved to an end position as a function of time, the duration of that movement is set here. After the expiration of this time the core is considered to be at the end position. Care must be taken to set this time so the core actually does complete its movement. When time dependent determination of the end positions is used, the inputs for the end positions must be jumpered to +24V. If one of these times is adjusted, the core is no longer considered at the end position and must be moved once again to the end position using the manual pushbutton. In order to make this easier, the program switch IGNORE CORE INTERLOCKS IN SETUP MODE can be used.

6,10 Monitoring time: These times are used to monitor the movement time when using limit switches to determine the end positions. When this time is set to zero, monitoring is deactivated. When a core pull movement is activated, the monitoring time is started. If the core does not reach the end positions switch and/or the intermediate stop switch before the expiration of the monitoring time, all core movements are stopped immediately, the control unit switches to manual mode, and the error CORE X NOT IN/OUT will be displayed.

12,13 Selectable delay times: These six times can be used as delay times in the core sequence. Each may be used once during the closing sequence, and once during the opening sequence, but not twice in either case. These time delays are treated like movements, i.e. operations can run parallel to them or wait until they are completed.

14-18 Input Status Display: Here the states of the end position switches are displayed.

MOLD STROKE POSITIONS



MOLD STROKE POSITIONS										2000-04-12 15:21	
START POSITION											
Move in	KS1=	0.0	<input type="checkbox"/>	KS2=	0.0	<input type="checkbox"/>	KS3=	0.0	<input type="checkbox"/>	mm	
Move out	KO1=	0.0	<input type="checkbox"/>	KO2=	0.0	<input type="checkbox"/>	KO3=	0.0	<input type="checkbox"/>	mm	
Use:	0	0									
MONITOR POS. CORE 1 CORE 2 CORE 3 CORE 4 CORE 5											
Closing	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	mm
Opening	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	mm
Use:											
MONITOR POS. CORE 6 CORE 7 CORE 8 CORE 9 CORE 10											
Closing	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	xx
Opening	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	0.0	<input type="checkbox"/>	xx
Opening stroke				A =	0.0	<input type="checkbox"/>	mm				
Actual mold position				SFx =	0.0	mm					
Move cores without clamping force				B8 =	0.0	<input type="checkbox"/>	mm				
Actual toggle position				SKx =	0.0	mm					
<div style="display: flex; justify-content: space-between; align-items: center;"> PROG. INTERRUPTION 1 </div>											
SEQUENCE SET-UP	PROGRAM SWITCHES	PROGRAM SWITCHES 2	SPEED & PRESSURES	SPEED & PRESSURES 2	TIMES & SIGNALS	TIMES & SIGNALS 2	e t c -->				
sck_po.ec Screen View! - Version V2.08f											

On this screen page all the corepull positions and stroke information is summarized.

DESCRIPTION OF THE INDIVIDUAL CORE POSITIONS

- 3 Move in:** Here three different corepull positions can be set during the closing stroke. These positions KS1, KS2, and KS3 can be used for any corepull. Each is a mold position.
- 4 Move out:** These three different corepull positions can be set during the opening stroke. Each can be used for any corepull and is based on a mold position.

- 9 Monitor position during closing:** Each core has an assigned monitor position which is active only when a value greater than zero is entered into it. When the mold reaches the monitoring position, the core must be at the end of its movement. If it is not, the error message CORE x NOT IN/OUT is displayed, mold movement stops, and the alarm lamp flashes. If the core subsequently reaches its end position, mold movement will continue on but the alarm lamp will continue to flash and the error will be displayed until it is cleared manually or by the start of a new automatic cycle.
- 10 Monitor position during opening:** These positions are analogous to the positions set on line 9, but are used during the mold opening sequence.
- 21 Move cores without clamping force:** If the mold position to move a core or for monitoring is set to 1.0mm (0.04in) a special case occurs. Instead of monitoring the cores based on the mold position, the toggle position B8 is used instead. This allows accurate control at a mold fully closed position, but before tonnage is built. It should be noted that the spring action of the tie-bars combined with the toggle will make some settings of this position physically impossible, as the tonnage of the mold tends to throw open the toggle.

OPERATION

In manual mode when a core pushbutton is activated, the movement list is searched starting at the beginning until a movement belonging to the pushbutton is found. When one is found, the safeties are checked to see whether its movement is permitted based on the conditions of the other cores and the mold. If it is not allowed, the search is continued on down the list for the next possible movement belonging to this pushbutton. If no movement is found which may move currently, error messages are displayed corresponding to the reason that the first core movement was blocked.

When activating on of the pushbuttons for mold movement, the movement list is searched through to determine which conditions are necessary to permit the mold to move.

When a movement is blocked due to a previous line or because a required permissive signal is missing, the marker flashes at the line where movement is blocked.

In the case that the cores are required to be in the end positions (usually in time dependent mode) but cores cannot be moved because they mutually interlock themselves, the following procedure is provided: In setup mode, switch on the screen switch IGNORE CORE INTERLOCKS IN SETUP. With this turned on, the cores can be moved regardless of the mold position or other core positions. In addition, the mold can be moved without checking the core positions, but only at the slower setup speed. Since the core interlocks are overridden, the operator must take care to ensure the safety of the mold.

ASSOCIATED PARAMETERS

See the CORE and CORE SERVICE variable groups for complete descriptions of the variables associated with this program.

ASSOCIATED DIGITAL INPUTS

DI14(dibe14)	core 1 is out
DI15(dibe15)	core 1 is in
DI16(dibe16)	core 2 is out
DI17(dibe17)	core 2 is in
DI18(dibe18)	core 3 is out
DI19(dibe19)	core 3 is in
DI29(dibka4)	core 4 is out
DI30(dibke4)	core 4 is in
DI65(dibka5)	core 5 is out
DI66(dibke5)	core 5 is in
DI67(dibka6)	core 6 is out

DI68(dibke6)	core 6 is in
DI69(dibka7)	core 7 is out
DI70(dibke7)	core 7 is in
DI71(dibka8)	core 8 is out
DI72(dibke8)	core 8 is in
DI73(dibka9)	core 9 is out
DI74(dibke9)	core 9 is in
DI75(dibka10)	core 10 is out
DI76(dibke10)	core 10 is in
Dixxx(dika1i)	core 1 out intermediate position reached
Dixxx(dike1i)	core 1 in intermediate position reached
Dixxx(dika2i)	core 2 out intermediate position reached
Dixxx(dike2i)	core 2 in intermediate position reached
Dixxx(dika3i)	core 3 out intermediate position reached
Dixxx(dike3i)	core 3 in intermediate position reached
Dixxx(dika4i)	core 4 out intermediate position reached
Dixxx(dike4i)	core 4 in intermediate position reached
Dixxx(dika5i)	core 5 out intermediate position reached
Dixxx(dike5i)	core 5 in intermediate position reached
Dixxx(dika6i)	core 6 out intermediate position reached
Dixxx(dike6i)	core 6 in intermediate position reached
Dixxx(dika7i)	core 7 out intermediate position reached
Dixxx(dike7i)	core 7 in intermediate position reached
Dixxx(dika8i)	core 8 out intermediate position reached
Dixxx(dike8i)	core 8 in intermediate position reached
Dixxx(dika9i)	core 9 out intermediate position reached
Dixxx(dike9i)	core 9 in intermediate position reached
Dixxx(dika10i)	core 10 out intermediate position reached
Dixxx(dike10i)	core 10 in intermediate position reached

ASSOCIATED DIGITAL OUTPUTS

DO32(dos14)	core 1 out
DO33(dos15)	core 1 in
DO34(dos16)	core 2 out
DO35(dos17)	core 2 in
DO36(dos18)	core 3 out
DO37(dos19)	core 3 in
DO38(doska4)	core 4 out
DO39(doske4)	core 4 in
DOxx(doska5)	core 5 out
DOxx(doske5)	core 5 in
DOxx(doska6)	core 6 out
DOxx(doske6)	core 6 in
DOxx(doska7)	core 7 out
DOxx(doske7)	core 7 in
DOxx(doska8)	core 8 out
DOxx(doske8)	core 8 in
DOxx(doska9)	core 9 out
DOxx(doske9)	core 9 in
DOxx(doska10)	core 10 out
DOxx(doske10)	core 10 in

ASSOCIATED MARKERS

Software Engineer: EUS/PE	Date: 040429	Filename: G:\!PCFS\!Suppliers\!Engel\Software\freely_programmable_core s.doc	Page: 10 of 10
---------------------------	-----------------	--	----------------

mk18(mktmke1)	push button - core 1 in
mk19(mktmka1)	push button - core 1 out
mk38(mktmke2)	push button - core 2 in
mk39(mktmka2)	push button - core 2 out
mk40(mktmke3)	push button - core 3 in
mk41(mktmka3)	push button - core 3 out
mkxxx(mktmke4)	push button - core 4 in
mkxxx(mktmka4)	push button - core 4 out
mkxxx(mktmke5)	push button - core 5 in
mkxxx(mktmka5)	push button - core 5 out
mkxxx(mktmke6)	push button - core 6 in
mkxxx(mktmka6)	push button - core 6 out
mkxxx(mktmke7)	push button - core 7 in
mkxxx(mktmka7)	push button - core 7 out
mkxxx(mktmke8)	push button - core 8 in
mkxxx(mktmka8)	push button - core 8 out
mkxxx(mktmke9)	push button - core 9 in
mkxxx(mktmka9)	push button - core 9 out
mkxxx(mktmke10)	push button - core 10 in
mkxxx(mktmka10)	push button - core 10 out

ASSOCIATED ERRORS

ER2331 (erki1)	CORE 1 NOT AT POS.
ER2333 (erki2)	CORE 2 NOT AT POS.
ER2334 (erki3)	CORE 3 NOT AT POS.
ER2335 (erki4)	CORE 4 NOT AT POS.
ER2336 (erki5)	CORE 5 NOT AT POS.
ER2337 (erki6)	CORE 6 NOT AT POS.
ER2338 (erki7)	CORE 7 NOT AT POS.
ER2339 (erki8)	CORE 8 NOT AT POS.
ER2340 (erki9)	CORE 9 NOT AT POS.
ER2341 (erki10)	CORE 10 NOT AT POS. <i>Cause:</i> The core is not at the intermediate stop position <i>Elimination:</i> Move the core to the intermediate position <i>Resetting:</i> Switch on/off the Manual/Auto switch
ER2212 (er_I1)	EJECTOR 1 NOT FWD <i>Cause:</i> The ejector is not at the forward position <i>Elimination:</i> Move the ejector to the forward position <i>Resetting:</i> Switch on/off the Manual/Auto switch
ER2330 (er_I2)	EJECTOR 1 NOT AT POS <i>Cause:</i> The ejector is not at the intermediate stop position <i>Elimination:</i> Move the ejector to the intermediate position <i>Resetting:</i> Switch on/off the Manual/Auto switch
ER2329 (erfehleinst)	CORE SETTING ! <i>Cause:</i> The core setup sequence is not correct. This could be due to stopping the mold before its movement is completed and not continuing it. <i>Elimination:</i> Correct the core sequence setup. <i>Resetting:</i> Switch on/off the Manual/Auto switch