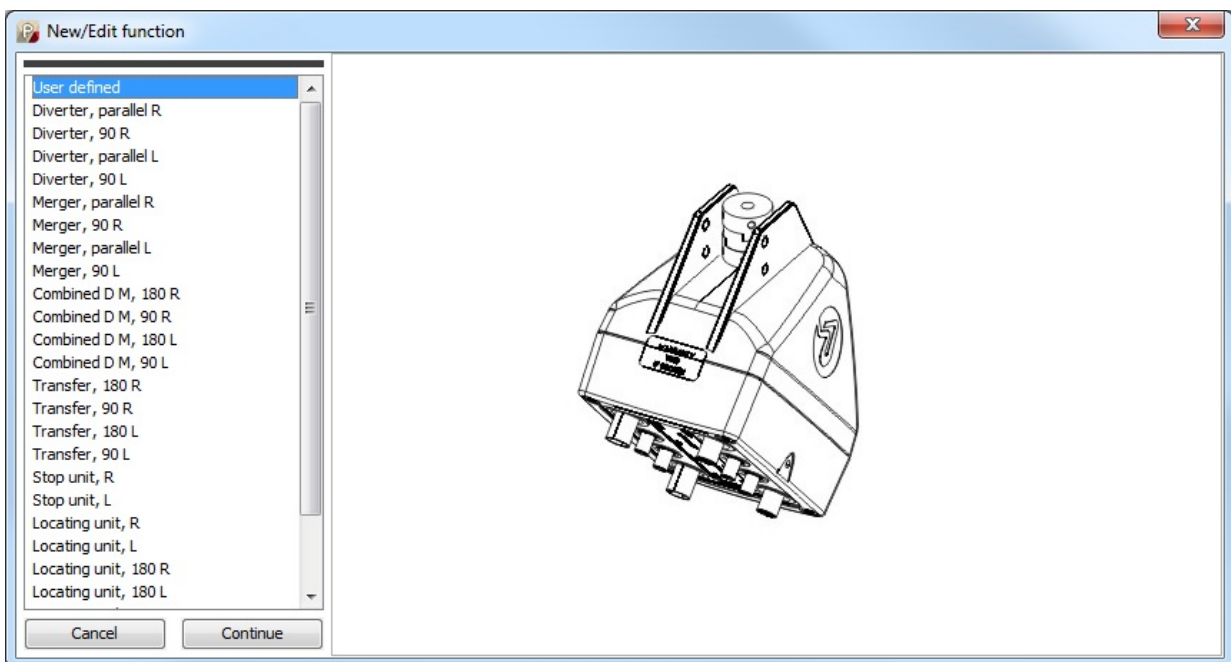


User defined variant

Last Modified on 06/11/2019 11:00 am CET

Background

The x45e units is mainly set as standard functions via the wizard. But it is also possible to use the function unit as a generic control. In these cases the wizard could be used to set the unit to **User defined**. Then it is possible to go into the **Advanced** mode (**Tools** menu or **CTRL + A**) and set all parameters individually.



Function mode

The Function mode parameter describes the group of functions the unit should act as.

- 1= Diverter
- 2= Mergers & Combined Diverter/Mergers
- 3 = Transfers & Stop units & Locating units
- 4 = Postition mode (described in a separate article)
- 5 = Speed mode (described in a separate article)

Function parameter / value

The x45e function unit is continuously running a sequence with three different step (Preturn / During production (Turn) / Post Turn). At start up it is always passing an Init state. There are four different function parameters. They are controlling how the unit should behave in all four sequence steps mentioned above.

Trigger

Some times the unit start to move directly when entering a new sequence state. But if wanted it could also be triggered by a defined condition. Typically it is a sensor event (Digital Input 1-4) or a PLC command (External command). The External command is the control bits sent from the PLC. (External command is described as the binary value of the control byte, 4 means the bits should be 0000 0100).

See User Documentation - Electrical System for deeper description.

Direction

The function unit could be set to either Clockwise or Counter Clockwise. In some case it could be set to both (CW/CCW). Then the Extra field contains a comment.

Destination

The Destination is defining the target position for the movement.

INA = Receive Angle 1

INB = Receive Angle 2

INC = Receive Angle 3

OUTA = Release Angle 1

OUTB = Release Angle 2

WAA = Wait Angle 1

WAB = Wait Angle 2

Speed

The unit has two speed setpoint. They are mainly differed regarding if the guide disc is supposed to move a puck or rotate empty. In some variants the speed setpoint is filled in explicitly.

Extra

If a comment is needed the Extra field is used.

Some variants have a built in delay:

- **Timer A is the timer used for During production (Turn).**
- **Timer B is the timer used for Post Turn.**
- **Timer E is the timer used for Pre Turn.**

Diverter

Function parameter	value	Trigger	Direction	Destination	Speed	Extra	Extra
1: Init	1		CCW	INA			
	2		CW	INA			
	3		CW	OUTA			
	4		CCW	OUTA			
2: Pre turn	1	DI1	CCW	INA			
	2	DI1	CW	INA			
	3	DI1	CW/CCW	INA			Direction = same as last movement
	4	DI3	CCW	INA			
	5	DI3	CW	INA			
	6	DI3	CW/CCW	INA			Direction = same as last movement
	7	External command = 4	CCW	INA			
	8	External command = 4	CW	INA			
	9	External command = 4	CW/CCW	INA			Direction = same as last movement
	10	External command = 1 or 2					Jump to during prod
3: During production	1	DI3	CCW	OUTA		Every other time	Time A delay
			CW	OUTB		Every other time	Time A delay
	2	DI3	CW	OUTA		Every other time	Time A delay
			CCW	OUTB		Every other time	Time A delay
	3	DI3 and DI2	CCW	OUTA			Time A delay
			CW	OUTB			Time A delay
	4	DI3 and DI2	CW	OUTA			Time A delay
			CCW	OUTB			Time A delay
	5	DI3 and not DI2	CW	OUTA			Time A delay
			CCW	OUTB			Time A delay
	6	DI3 and not DI2	CCW	OUTA			Time A delay
			CW	OUTB			Time A delay
	7	DI3 & External command = 1	CCW	OUTA			
			CW	OUTB			
8	DI3 & External command = 2	CW	OUTA				
		CCW	OUTB				
9	External command = 1	CCW	OUTA				
		CW	OUTB				
10	External command = 1	CW	OUTA				
		CCW	OUTB				
4: Post turn	1	OUTA	CCW	WAA			Time B delay
			CW	WAB			Time B delay
	2	OUTB	CW	WAA			Time B delay
			CCW	WAB			Time B delay

Merger & Combined Merger/Diverter

Function parameter	value	Trigger	Direction	Destination	Speed	Extra	Extra
1: Init	1		CCW	OUTA			
	2		CCW	OUTB			
	3		CW/CCS	OUTA		closest	
	4		CW/CCS	OUTB		closest	
2: Pre turn	1	DI1	CW	INA			
			CCW	INB			
	2	DI1	CCW	INA			
			CW	INB			
	3	DI1 and OUTA	CW	INA			
			CCW	INA			
	4	DI1 and OUTB	CCW	INC			
			CW	INC			
	5	DI2 and OUTA	CW	INA			
			CCW	INC			
	6	DI2 and OUTB	CW	INA			
			CCW	INC			
	7	Ext cmd = 4 and OUTA	CW	INA			
			CCW	INC			
	8	Ext cmd = 4 and OUTB	CW	INA			
			CCW	INC			
	9	Ext cmd = 8 and OUTA	CW	INA			
			CCW	INC			
	10	Ext cmd = 8 and OUTB	CW	INA			
			CCW	INC			
	11	Ext cmd = 16 and OUTA	CW	INA			
			CCW	INC			
	12	Ext cmd = 16 and OUTB	CW	INA			
			CCW	INC			
	13	DI1 and OUTA	CW	INA			
			CCW	INA			
	14	DI1 and OUTB	CCW	INA			
			CW	INB			
	15	DI2 and OUTA	CCW	INB			
			CW	INB			
	16	DI2 and OUTB	CW	INA			
			CCW	INB			
	17	DI1 and OUTA	CW	INA			
			CCW	INA			
	18	DI1 and OUTB	CW	INA			
			CCW	INB			
	19	DI2 and OUTA	CW	INA			
			CCW	INB			
	20	DI2 and OUTB	CW	INA			
			CCW	INB			
21	Ext cmd = 4	CW	INA				
		CCW	INB				
22	Ext cmd = 8	CW	INA				
		CCW	INB				
23	Ext cmd = 4	CW	INA				
		CCW	INB				
24	Ext cmd = 8	CW	INA				
		CCW	INB				

3: During production	1	DI3	CCW	OUTA			Time A delay	
		DI4	CW	OUTB			Time A delay	
	2	DI3	CW	OUTA			Time A delay	
		DI4	CCW	OUTB			Time A delay	
	3	DI3	CCW	OUTB			Time A delay	
		DI4	CW	OUTA			Time A delay	
	4	DI3	CW	OUTB			Time A delay	
		DI4	CCW	OUTA			Time A delay	
	5	DI3	CW	OUTB			Time A delay	
		DI4	CW	OUTA			Time A delay	
	6	DI3	CCW	OUTB			Time A delay	
		DI4	CCW	OUTA			Time A delay	
	7		DI3 and Ext cmd = 1 and INA	CCW	OUTA			
			DI4 and Ext cmd = 1 and (INB or INC)	CW	OUTA			
			DI3 and Ext cmd = 2 and INA	CW	OUTB			
			DI4 and Ext cmd = 2 and (INB or INC)	CCW	OUTB			
	8		DI3 and Ext cmd = 1 and INA	CW	OUTA			
			DI4 and Ext cmd = 1 and (INB or INC)	CCW	OUTA			
			DI3 and Ext cmd = 2 and INA	CCW	OUTB			
			DI4 and Ext cmd = 2 and (INB or INC)	CW	OUTB			
	9		External command 1 & INA	CW	OUTA			
			External command 1 & INB	CCW	OUTA			
	10		External command 1 & INA	CCW	OUTA			
			External command 1 & INB	CW	OUTA			
	11		Ext cmd = 1 and INA	CCW	OUTA			
			Ext cmd = 1 and (INB or INC)	CW	OUTA			
			Ext cmd = 2 and INA	CW	OUTB			
			Ext cmd = 2 and (INB or INC)	CCW	OUTB			
	12		Ext cmd = 1 and INA	CW	OUTA			
			Ext cmd = 1 and (INB or INC)	CCW	OUTA			
			Ext cmd = 2 and INA	CCW	OUTB			
			Ext cmd = 2 and (INB or INC)	CW	OUTB			
	13		Ext cmd = 1 and INA	CCW	OUTA			
			Ext cmd = 1 and (INB or INC)	CW	OUTA			
			Ext cmd = 2 and INA	CCW	OUTB			
			Ext cmd = 2 and (INB or INC)	CW	OUTB			
	14		Ext cmd = 1 and INA	CW	OUTA			
			Ext cmd = 1 and (INB or INC)	CCW	OUTA			
			Ext cmd = 2 and INA	CW	OUTB			
			Ext cmd = 2 and (INB or INC)	CCW	OUTB			
	15		DI3 (one to OUTA, one to OUTB)	CCW	OUTA			
				CCW	OUTB			
			DI4 (one to OUTA, one to OUTB)	CW	OUTA			
				CW	OUTB			
	16		DI3 (one to OUTA, one to OUTB)	CW	OUTA			
				CW	OUTB			
			DI4 (one to OUTA, one to OUTB)	CCW	OUTA			
				CCW	OUTB			
4: Post tum	1					Time B delay		

Transfers & Stop units & Locating units

Function parameter	value	Trigger	Direction	Destination	Extra	Extra
1: Init	1		CCW	INA		
	2		CW	INA		
	3		CCW	OUTA		
	4		CW	OUTA		
	5		CCW	OUTB		
	6		CW	OUTB		
2: Pre tum	1	DI1	CCW	WAA	Setpoint1	Time E delay
	2	DI1	CW	WAA	Setpoint1	Time E delay
	3	DI1	CCW	WAB	Setpoint1	Time E delay
	4	DI1	CW	WAB	Setpoint1	Time E delay
	5	DI1	CW	INA	Setpoint2	Time E delay
	6	DI1	CCW	INA	Setpoint2	Time E delay
	7	DI1 and External command = 4	CCW	INA	Setpoint2	
	8	DI1 and External command = 4	CW	INA	Setpoint2	
	9		CW	INA	Setpoint2	Time E delay
	10		CCW	INA	Setpoint2	Time E delay
	11	External command = 4	CCW	INA	Setpoint2	
	12	External command = 4	CW	INA	Setpoint2	
	13	DI1 and External command = 2 or 256, OUTB or WAA	CW	WAA	Setpoint1	
	14	DI1 and External command = 1, OUTA	CCW	OUTA	Setpoint1	
	15	DI1 and External command = 2 or 256, OUTB or WAA	CCW	WAA	Setpoint1	
	16	DI1 and External command = 1, OUTA	CW	OUTA	Setpoint1	
	17	External command = 2 or 256, OUTB or WAA	CW	WAA	Setpoint1	
	18	External command = 1, OUTA	CCW	OUTA	Setpoint1	
	19	External command = 2 or 256, OUTB or WAA	CCW	WAA	Setpoint1	
	20	External command = 1, OUTA	CW	OUTA	Setpoint1	
	21	External command = 8 (INB)	CW	INB		
	22	External command = 8 (INB)	CCW	INB		

3: During production	1		CCW	OUTA			Time A delay
	2		CW	OUTA			Time A delay
	3		CCW	OUTB			Time A delay
	4		CW	OUTB			Time A delay
	5	External command = 1	CW	OUTA			
	6	External command = 1	CCW	OUTA			
	7	DI1	CCW	OUTB			Time A delay
	8	DI1	CW	OUTB			Time A delay
	9	DI2	CW	OUTA			
	10	DI2	CCW	OUTA			
	11	DI2	CW	OUTB			
	12	DI2	CCW	OUTB			
	13	DI1	CW	OUTA			Time A delay
	14	DI1	CCW	OUTA			Time A delay
	15	External command = 2	CW	OUTB			
	16	External command = 2	CCW	OUTB			
	17	Timer if (puck in process); move if (DI3 or (puck in process and	CW	INC			
	18	Timer if (puck in process); move if (DI3 or (puck in process and	CCW	INC			
	19	DI2 (InPosition at INB) and (DI3 or (not DI3 and not DI1))	CW	INC			
	20	DI2 (InPosition at INB) and (DI3 or (not DI3 and not DI1))	CCW	INC			
	21	External command = 16 (INC)	CW	INC			
	22	External command = 16 (INC)	CCW	INC			
4: Post turn	1		CCW	INA			Time B delay
	2		CW	INA			Time B delay
	3		CCW	OUTA			Time B delay
	4		CW	OUTA			Time B delay
	5	External command = 4	CCW	INA	Setpoint2		
	6	External command = 4	CW	INA	Setpoint2		
	7		CCW	OUTB			Time B delay
	8		CW	OUTB			Time B delay
	9	not DI2		stay			
	10			stay			
	11	Timer if (puck in process); move if (DI3 or (puck in process and	CW	INA			
	12	Timer if (puck in process); move if (DI3 or (puck in process and	CCW	INA			
	13	DI2 (InPosition at INC) and (DI3 or (not DI3 and not DI1))	CW	INA			
	14	DI2 (InPosition at INC) and (DI3 or (not DI3 and not DI1))	CCW	INA			
	15	External command = 4 (INA)	CW	INA	Setpoint1		
	16	External command = 4 (INA)	CCW	INA	Setpoint1		