

TECHNICAL DOCUMENTATION

Example 13.4

Project	Example 13.4
Designer	
Application	example_13_4.stu
Software Version	ControlExpert V15.0-SP1
Creation Date	6/16/2023 2:11:02 PM
Last Modification Date	6/16/2023 2:12:28 PM
Target PLC	BMX P34 1000 02.00CPU 340-10 Modbus

MAST

Specific properties

Configuration	Cyclic
Task period configuration	0
Watchdog time configuration	250

Tank_Control : [MAST]

```
120|      1|      10|      20|      30|      40|      50|      60|      70|      80|      90|      100|      110|
      134|
1  (* Copyright (c) 2011 Dogwood Valley Press, LLC *)
2
3  (* Convert analog input to level *)
4  LD      15.0
5  SUB     1.0
6  ST      TmpR
7  LD      LT428_MEAS
8  INT_TO_REAL
9  MUL     TmpR
10 DIV     10000.0
11 ADD     1.0
12 ST      LT428_Val
13
14 (* Level control: turn on when low, turn off when *)
15 (*   high. If not enabled, always turn off          *)
16 LD      LT428_Val
17 LT      T428_Min
18 OR      XV427_OPEN
19 AND(
20 LD      LT428_Val
21 LE      T428_Max
22 )
23 AND     T428_Cntrl
24 ST      XV427_OPEN
```

Operator_Intf : [MAST]

```
120| 1| 10| 20| 30| 40| 50| 60| 70| 80| 90| 100| 110|
      134|
1 (* Example 13.4 *)
2 (* Copyright (c) 2023 Dogwood Valley Press, LLC *)
3
4 (* Check for T428_Min less than min or greater than max *)
5 LD T428_Min
6 LT 2.1 (* Check for less than 2.1 *)
7 JMPCN TUprr
8 LD 2.1
9 ST T428_Min
10 TUprr: LD T428_Min
11 GT 13.4 (* Check for gtr than 13.4 *)
12 JMPCN DoAdd
13 LD 13.4
14 ST T428_Min
15
16 (* Calculate max level *)
17 DoAdd: LD T428_Min
18 ADD 1.5
19 ST T428_Max
20
21 (* Low level alarms *)
22 LD LT428_Val
23 LT 4.0
24 ST T428_LOLA
25
26 LD LT428_Val
27 LT 2.0
28 ST T428_Hrn_Act
29
30 (* Trigger horn when level drops below 2.0 or *)
31 (* stays below 2 for 5 minutes after ack'ed. *)
32 CAL HrnTrig(CLK:=T428_Hrn_Act)
33 CAL AckTrig (CLK:=Alm_Ack)
34 LD HrnTrig.Q
35 OR Ack_Tmr.Q
36 OR (
37 LD T428_HORN
38 ANDN AckTrig.Q
39 )
```

Operator_Intf

```
120 | 1 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |
      134 |
40      ST      T428_HORN
41
42      (* Time level staying below 2 after ack *)
43      LD      AckTrig.Q
44      OR      Ack_Tmr_En
45      AND     T428_Hrn_Act
46      ANDN    Ack_Tmr.Q
47      ST      Ack_Tmr_En
48      CAL     Ack_Tmr ( IN:=Ack_Tmr_En , PT:=t#5m0s0ms )
```

FAST

Specific properties

Configuration	Periodic
Task period configuration	5
Watchdog time configuration	100

Cross References

Application:

Addresses

Object	Referred into	Location	Usage
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Variables or FB instances

Object	Referred into	Location	Usage
Ack_Tmr	Operator_Intf : [MAST]	(l 35, c: 13)	R
		(l 46, c: 13)	R
		(l 48, c: 13)	FC
Ack_Tmr_En	Operator_Intf : [MAST]	(l 44, c: 13)	R
		(l 47, c: 13)	W
		(l 48, c: 25)	R
AckTrig	Operator_Intf : [MAST]	(l 33, c: 13)	FC
		(l 38, c: 13)	R
		(l 43, c: 13)	R
Alm_Ack	Operator_Intf : [MAST]	(l 33, c: 27)	R
HmTrig	Operator_Intf : [MAST]	(l 32, c: 13)	FC
		(l 34, c: 13)	R
LT428_MEAS	Tank_Control : [MAST]	(l 7, c: 5)	R
LT428_Val	Tank_Control : [MAST]	(l 12, c: 5)	W
		(l 16, c: 5)	R
		(l 20, c: 5)	R
	Operator_Intf : [MAST]	(l 22, c: 13)	R
		(l 26, c: 13)	R
T428_Cntrl	Tank_Control : [MAST]	(l 23, c: 6)	R
T428_HORN	Operator_Intf : [MAST]	(l 37, c: 13)	R
		(l 40, c: 13)	W
T428_Hrn_Act	Operator_Intf : [MAST]	(l 28, c: 13)	W
		(l 32, c: 26)	R
		(l 45, c: 13)	R
T428_LOLA	Operator_Intf : [MAST]	(l 24, c: 13)	W
T428_Max	Tank_Control : [MAST]	(l 21, c: 5)	R
	Operator_Intf : [MAST]	(l 19, c: 13)	W
T428_Min	Tank_Control : [MAST]	(l 17, c: 5)	R
	Operator_Intf : [MAST]	(l 9, c: 13)	W
		(l 10, c: 13)	R
		(l 14, c: 13)	W
		(l 17, c: 13)	R
		(l 5, c: 13)	R
TmpR	Tank_Control : [MAST]	(l 6, c: 5)	W
		(l 9, c: 6)	R
XV427_OPEN	Tank_Control : [MAST]	(l 18, c: 5)	R
		(l 24, c: 5)	W

EF objects

Object	Referred into	Location	Usage
int_to_real	Tank_Control : [MAST]	(l 8, c: 2)	FC

Cross References

BCD_INT:

Variables or FB instances

Object	Referred into	Location	Usage
dig	BCDToInt <DFB> : [BCD_INT]	(l 25, c: 4)	W
		(l 26, c: 7)	R
		(l 29, c: 25)	R
djunkin	BCDToInt <DFB> : [BCD_INT]	(l 20, c: 2)	W
		(l 25, c: 23)	R
		(l 30, c: 15)	R
		(l 30, c: 4)	W
		(l 35, c: 5)	R
		(l 43, c: 37)	R
errflg	BCDToInt <DFB> : [BCD_INT]	(l 23, c: 2)	W
		(l 27, c: 7)	W
		(l 36, c: 4)	W
		(l 40, c: 5)	R
i	BCDToInt <DFB> : [BCD_INT]	(l 24, c: 6)	R
In_BCD	BCDToInt <DFB> : [BCD_INT]	(l 20, c: 26)	R
mult	BCDToInt <DFB> : [BCD_INT]	(l 21, c: 2)	W
		(l 29, c: 29)	R
		(l 31, c: 12)	R
		(l 31, c: 4)	W
		(l 43, c: 48)	R
Out_Int	BCDToInt <DFB> : [BCD_INT]	(l 22, c: 2)	W
		(l 29, c: 15)	R
		(l 29, c: 4)	W
		(l 41, c: 4)	W
		(l 43, c: 15)	R
		(l 43, c: 4)	W

EF objects

Object	Referred into	Location	Usage
dint_to_int	BCDToInt <DFB> : [BCD_INT]	(l 25, c: 11)	FC
		(l 43, c: 25)	FC
word_to_dint	BCDToInt <DFB> : [BCD_INT]	(l 20, c: 13)	FC

Cross References

INT_BCD:

Variables or FB instances

Object	Referred into	Location	Usage
dig	IntToBCD <DFB> : [INT_BCD]	(l 23, c: 6)	W
		(l 24, c: 27)	R
i	IntToBCD <DFB> : [INT_BCD]	(l 22, c: 8)	R
In_Int	IntToBCD <DFB> : [INT_BCD]	(l 18, c: 7)	R
		(l 18, c: 30)	R
		(l 19, c: 14)	R
junkin	IntToBCD <DFB> : [INT_BCD]	(l 19, c: 4)	W
		(l 23, c: 13)	R
		(l 25, c: 16)	R
		(l 25, c: 6)	W
		(l 32, c: 31)	R
mult	IntToBCD <DFB> : [INT_BCD]	(l 20, c: 4)	W
		(l 24, c: 31)	R
		(l 26, c: 14)	R
		(l 26, c: 6)	W
Out_BCD	IntToBCD <DFB> : [INT_BCD]	(l 17, c: 2)	W
		(l 32, c: 4)	W
out_int	IntToBCD <DFB> : [INT_BCD]	(l 21, c: 4)	W
		(l 24, c: 17)	R
		(l 24, c: 6)	W
		(l 32, c: 59)	R

EF objects

Object	Referred into	Location	Usage
int_to_word	IntToBCD <DFB> : [INT_BCD]	(l 32, c: 19)	FC
		(l 32, c: 47)	FC
rol	IntToBCD <DFB> : [INT_BCD]	(l 32, c: 15)	FC
rol_word	IntToBCD <DFB> : [INT_BCD]	(l 32, c: 15)	FC

Cross References

New_DFB:

Variables or FB instances

Object	Referred into	Location	Usage
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