Project Documentation

File:	CtrlX_PW_02_2025_V1_0_Solution.project
Date:	24.02.2025
Profile:	ctrlX PLC 1.20.7

Table des matières

1 Dossier: PW_DUT

1.1 DUT: ST_Conveyor

```
1      (*
2              www.hevs.ch
3              Institut Systemes Industriels
4              Project:        Projet No: PW_02
5              Author:              Cedric Lenoir
6              Date:              2024 January 16
7
8              Summary:        Main structure for conveyor.
9      *)
10     TYPE  ST_Conveyor :
11     STRUCT
12         cm01    : ST_StationConveyor ;
13         cm02    : ST_StationConveyor ;
14         cm03    : ST_StationConveyor ;
15         cmOut   : ST_StationOutput ;
16         cmDrive : ST_MotorConveyor ;
17     END_STRUCT
18     END_TYPE
19
```

1.2 DUT: ST_MotorConveyor

```
1      (*
2              www.hevs.ch
3              Institut Systemes Industriels
4              Project:        Projet No: PW_01
5              Author:              Cedric Lenoir
6              Date:              2023 October 11
7
8              Summary:        List of of components for a motor of a conveyor.
9      *)
10     TYPE  ST_MotorConveyor :
11     STRUCT
12         bK_ActivatePositiveDirection    : BOOL ;
13         bK_ActivateNegativeDirection    : BOOL ;
14     END_STRUCT
15     END_TYPE
16
```

1.3   DUT: ST_StationConveyor

```
1       (*
2               www.hevs.ch
3               Institut Systemes Industriels
4               Project:        Projet No: PW_01
5               Author:             Cedric Lenoir
6               Date:               2023 October 11
7
8               Summary:        List of of components for a station of a conveyor.
9       *)
10      TYPE  ST_StationConveyor  :
11      STRUCT
12          bButton : BOOL ;
13          bLed    : BOOL ;
14          bSensor : BOOL ;
15      END_STRUCT
16      END_TYPE
17
```

1.4   DUT: ST_StationOutput

```
1       (*
2               www.hevs.ch
3               Institut Systemes Industriels
4               Project:        Projet No: PW_01
5               Author:             Cedric Lenoir
6               Date:               2024 January 14
7
8               Summary:        ST_OutputConveyor extends ST_StationConveyor.
9       *)
10      TYPE ST_StationOutput EXTENDS  ST_StationConveyor  :
11      STRUCT
12          bBuzzer    : BOOL ;
13      END_STRUCT
14      END_TYPE
15
```

2   Dossier: PW_POU

2.1 POU: FB_Drive

```
1      (*
2              www.hevs.ch
3              Institut Systemes Industriels
4              Project:        Projet No: PW_02
5              Author:             Cedric Lenoir
6              Date:               2024 January 16
7
8              Summary:        Manage drive for motor conveyor.
9      *)
10     FUNCTION_BLOCK  FB_Drive
11     VAR_INPUT
12         Enable  :  BOOL ;
13     END_VAR
14     VAR_IN_OUT
15         ioDrive          :  ST_MotorConveyor ;
16         stationOne       :  FB_Station ;
17         stationTwo       :  FB_Station ;
18         stationThree     :  FB_Station ;
19         stationOut       :  FB_OutStation ;
20     END_VAR
21     VAR_OUTPUT
22     END_VAR
23     VAR
24     END_VAR
25
```

```
1      IF  Enable  THEN
2          ioDrive . bK_ActivatePositiveDirection  :=  NOT ( stationOne . stop    OR
3                                                            stationTwo . stop    OR
4                                                            stationThree . stop  OR
5                                                            stationOut . stop ) ;
6      END_IF
7
```

2.2 POU: FB_OutStation

```
1      (*
2              www.hevs.ch
3              Institut Systemes Industriels
4              Project:        Projet No: PW_02
5              Author:             Cedric Lenoir
6              Date:               2024 January 16
7
8              Summary:        Manage One station for a conveyor.
9      *)
10     FUNCTION_BLOCK  FB_OutStation
11     VAR_INPUT
12         Enable       :  BOOL ;
13     END_VAR
14     VAR_IN_OUT
15         ioStation   :  ST_StationOutput ;
16     END_VAR
```

```
17      VAR_OUTPUT
18          diCounter  : DINT ;
19          stop       : BOOL ;
20          release    : BOOL ;
21      END_VAR
22      VAR
23          // Used to count the number of inputs in station
24          rTrigIn    : R_TRIG ;
25          // Reset Counte if TON for more that 2 seconds
26          tonResetCounter : TON ;
27      END_VAR
28
```

```
1       IF Enable THEN
2           rTrigIn ( CLK := ioStation . bSensor ) ;
3
4           IF rTrigIn . Q THEN
5               diCounter := diCounter + 1 ;
6               release := FALSE ;
7               stop := TRUE ;
8           END_IF
9           IF ioStation . bButton THEN
10              release := TRUE ;
11              stop := FALSE ;
12          END_IF
13          ioStation . bLed := stop ;
14
15          tonResetCounter ( IN := ioStation . bButton ,
16                            PT := T#2S ) ;
17
18          IF tonResetCounter . Q THEN
19              diCounter := 0 ;
20          END_IF
21
22          ioStation . bBuzzer := stop ;
23      END_IF
24
```

2.3 POU: FB_Station

```
1       (*
2               www.hevs.ch
3               Institut Systemes Industriels
4               Project:        Projet No: PW_02
5               Author:             Cedric Lenoir
6               Date:               2024 January 16
7
8               Summary:        Manage One station for a conveyor.
9       *)
10      FUNCTION_BLOCK FB_Station
11      VAR_INPUT
12          Enable      : BOOL ;
13      END_VAR
14      VAR_IN_OUT
15          ioStation   : ST_StationConveyor ;
```

```
16        END_VAR
17        VAR_OUTPUT
18            diCounter   :  DINT ;
19            stop        :  BOOL ;
20            release     :  BOOL ;
21        END_VAR
22        VAR
23            // Used to count the number of inputs in station
24            rTrigIn     :  R_TRIG ;
25            // Reset Counte if TON for more that 2 seconds
26            tonResetCounter :  TON ;
27        END_VAR
28
```

```
1         IF  Enable  THEN
2             rTrigIn ( CLK  :=  ioStation . bSensor ) ;
3
4             IF  rTrigIn . Q  THEN
5                 diCounter  :=  diCounter  +  1 ;
6                 release  :=  FALSE ;
7                 stop  :=  TRUE ;
8             END_IF
9             IF  ioStation . bButton  THEN
10                release  :=  TRUE ;
11                stop  :=  FALSE ;
12            END_IF
13            ioStation . bLed  :=  stop ;
14
15            tonResetCounter ( IN  :=  ioStation . bButton ,
16                              PT  :=  T#2S ) ;
17
18            IF  tonResetCounter . Q  THEN
19                diCounter  :=  0 ;
20            END_IF
21        END_IF
22
```

3 POU: PRG_Student

```
1         (*
2             Practical Work 01 / Write your first PLC Code here
3
4             www.hevs.ch
5             Institut Systemes Industriels
6             Project:      HEVS Pack 2022
7             Author:           Cedric Lenoir / Christophe Truffer
8             Date:             2025 January 29
9         *)
10        PROGRAM  PRG_Student
11        VAR
12            diMyLoop                 :  DINT ;
13            emConveyor               :  ST_Conveyor ;
14            testMode                 :  BOOL ;
15
```

```
16        fbStationOne              : FB_Station ;
17        fbStationTwo              : FB_Station ;
18        fbStationThree            : FB_Station ;
19        fbOutStation              : FB_OutStation ;
20        fbDrive                   : FB_Drive ;
21    END_VAR
22
```

```
1     diMyLoop := diMyLoop + 1 ;
2
3     //
4     // Manage inputs
5     //
6     // cm01
7     emConveyor . cm01 . bButton := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_0 ;
8     emConveyor . cm01 . bSensor := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_4 ; // UA_DigitalInput_32_Input_0_4;
9     // cm02
10    emConveyor . cm02 . bButton := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_1 ;
11    emConveyor . cm02 . bSensor := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_5 ;
12    // cm03
13    emConveyor . cm03 . bButton := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_2 ;
14    emConveyor . cm03 . bSensor := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_6 ;
15    // cmOut
16    emConveyor . cmOut . bButton := GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_3 ;
17    emConveyor . cmOut . bSensor := NOT GVL_Abox . uaAboxInterface . uaDigitalIn .
      Input_0_7 ; // Signal inverted
18
19
20    // Execute Control Modules
21    fbStationOne ( Enable := NOT testMode ,
22            ioStation := emConveyor . cm01 ) ;
23    fbStationTwo ( Enable := NOT testMode ,
24            ioStation := emConveyor . cm02 ) ;
25    fbStationThree ( Enable := NOT testMode ,
26            ioStation := emConveyor . cm03 ) ;
27
28    fbOutStation ( Enable := NOT testMode ,
29            ioStation := emConveyor . cmOut ) ;
30
31
32    fbDrive ( Enable := NOT testMode ,
33            ioDrive := emConveyor . cmDrive ,
34            stationOne := fbStationOne ,
35            stationTwo := fbStationTwo ,
36            stationThree := fbStationThree ,
37            stationOut := fbOutStation ) ;
38
39    //
```

```
40      // Manage outputs
41      //
42      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_0  :=  emConveyor . cm01 .
        bLed ;
43      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_1  :=  emConveyor . cm02 .
        bLed ;
44      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_2  :=  emConveyor . cm03 .
        bLed ;
45      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_3  :=  emConveyor . cmOut .
        bLed ;
46      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_4  :=  emConveyor . cmDrive .
        bK_ActivatePositiveDirection ;
47      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_5  :=  emConveyor . cmDrive .
        bK_ActivateNegativeDirection ;
48      GVL_Abox . uaAboxInterface . uaDigitalOut . Output_0_6  :=  emConveyor . cmOut .
        bBuzzer ;
49
50
```

4 : Project Settings

Analyse statique Light:

Variables non-utilisées (#33): 0
Zones de mémoire chevauchées (#28): 0
Accès simultané (#6): 0
Accès en écriture multiple sur la sortie (#4): 0
Usage multiple du nom (#27): 0
Rapport instances temporaires de bloc fonctionnel (#167): 0
Opération suspecte sur chaîne (#175): 0