## OB1 - <offline>

Name: Family: 0.1
Author: Version: 0.1
Block version: 2
Time stamp Code: 07/11/2023 09:42:51 PM
Interface: 02/15/1996 04:51:12 PM
Lengths (block/logic/data): 02764 02494 00250

Name	Data Type	Address	Comment
TEMP		0.0	
OB1_EV_CLASS	Byte	0.0	Bits $0-3 = 1$ (Coming event), Bits $4-7 = 1$ (Event class 1)
OB1_SCAN_1	Byte	1.0	1 (Cold restart scan 1 of OB 1), 3 (Scan 2-n of OB 1)
OB1_PRIORITY	Byte	2.0	Priority of OB Execution
OB1_OB_NUMBR	Byte	3.0	1 (Organization block 1, OB1)
OB1_RESERVED_1	Byte	4.0	Reserved for system
OB1_RESERVED_2	Byte	5.0	Reserved for system
OB1_PREV_CYCLE	Int	6.0	Cycle time of previous OB1 scan (milliseconds)
OB1_MIN_CYCLE	Int	8.0	Minimum cycle time of OB1 (milliseconds)
OB1_MAX_CYCLE	Int	10.0	Maximum cycle time of OB1 (milliseconds)
OB1_DATE_TIME	Date_And_Time	12.0	Date and time OB1 started

## Block: OB1 "Main Program Sweep (Cycle)"

```
Network: 1 PLC conn. for scada
```

```
M0.0
"PLC OK"

M0.0
"bibolar"

()
```

## Network: 2 voltage and current measuring

```
FC105
Scaling Values
"SCALE"
MO.0
"PLC OK"
  \dashv \vdash
                                                RET_VAL - MW10
                      MW36-IN
                                                     OUT - MD38
              2.200000e+
                       002-HI_LIM
              0.000000e+
000-LO_LIM
                M5.0
"zero
analog
bibolar"—BIPOLAR
                               MUL_I
ENO
                "voltage
sensor
                 analoge"—IN1
                                     OUT - MW36
                         2 -IN2
                                 FC105
Scaling Values
"SCALE"
                      MW42-IN
                                                RET_VAL - MW10
               5.000000e+
                                                     OUT - MD44
                       000-HI_LIM
              0.000000e+
000-LO_LIM
                M5.0
"zero
analog
bibolar"—BIPOLAR
                              MUL_I
ENO
                 PIW5
                "current
                sensor analoge" -IN1 OUT -MW42
                         2-IN2
```

```
Network: 3
                    system run for scada
                     T13
                                                   M2.5
                 "factory reset
                                                 "system
run for
     I0.0
   "start
   system"
                   timer"
                                                  scada"
     \dashv \vdash
                                                    \prec \succ
                                                    T14
                                                 "start
                                                 system
timer"
                                                   S_ODT
                                                          Q
                                  S5T#500MS-TV
                                                         ΒI
                                                        BCD-
```

```
Network: 4 raw pump system operation
```

```
T14
                                T13
                                               T19
                            "factory
"start
                                           "raw pump
                 I0.1
             "LEVsensor
Raw tank"
                              reset
timer"
                                            force
stop t"
                                                              Q0.0
system
timer"
                                                           "raw pump"
 \dashv \vdash
                                                              \prec \succ
                M0.4
             "test raw
               pump
scada"
                                T19
                            "raw pump
                M3.1
              "force
                             force
stop t"
             stop raw
               pump"
                              S_OFFDT
                                      Q
                   S5T#2S TV
                                     BI-
                                    BCD -
                                 T1
                             "AL2SO4
                            open time"
                                            "AL2SO4
                Q0.0
              "raw pump"
                                             valve"
                               S_ODT
                                               \prec \succ
                   S5T#2S TV
                                     ΒI
                                    BCD -
```

```
Network: 5 flash mixer network
```

```
м3.3
                              I1.0
                                             T13
                                                        "force
                          "LEVsensor
                                                                      Q0.2
"flash
mixer"
                                         "factory
                                                         stop
MO.0
                                          reset timer"
               Q0.0
                            flash
                                                         flash
             "raw pump"
                            mixer"
                                                         mixer"
                                                          -1/1
                                                                         \prec \succ
               M0.5
              "test
              flash
              mixer
              scada"
               I1.0
                                            M5.1
            "LEVsensor
                                          "flash
             flash
mixer"
                                          mixer
                                        tank full"
                            "flash
               I1.0
                                            M4.6
            "LEVsensor
                                          "flash
                            mixer
                                          mixer
over"
              flash
                             over
              mixer"
                            sensor"
```

```
Network: 6
                slow mixer network
                          I1.1
"LEVsensor
                                           T13
                                                       M3.4
                                       "factory
                                                     "force
                                                                    Q0.3
  M0.0
"PLC OK"
                 Q0.0
                                                    stop slow
                                                                   "slow
                             slow
                                         reset
                                                      mixer"
                                                                  mixer"
              "raw pump"
                            mixer"
                                         timer"
                              \dashv \vdash
    +
                                           +1
                                                        1/
                                                                    ← >—
                 M0.6
                "test
                slow
               mixer
               scada"
                 +
                 I1.1
                                          M5.2
              "LEVsensor
                                         "slow
                                         mixer
                slow
               mixer"
                                       full tank"
```

```
Network: 7 sludge pump network
```

```
T17
  T14
                T13
                             I1.3
                                           I0.7
                                                      "sludge
            "factory
                                       "sludge H-
"start
                         "sludge L-
                                                        pump
                                                                       Q1.3
                                                                    "sludge
pump"
              reset
timer"
                                         sensor
tank"
system
                           sensor
                                                       force
                                                       stop t"
timer"
                            tank"
 +
                1/
                                            +
                                                                        \leftarrow
                                           Q1.3
                                        "sludge
                                          pump"
                            M0.7
                            "test
                           sludge
                            pump
                            scada"
                             \dashv \vdash
                                            T17
                             M3.5
                                        "sludge
                           "force
                                          pump
                                          force
                            stop
                                         stop t"
                           sludge
                            pump"
                                         S_OFFDT
                                                 Q
                               S5T#2S-TV
                                                ΒI
                                               BCD -
                                           M1.0
                                        "sludge
                             Q1.6
                          "sludge
                                          pipe
                           valve
                          filter1"
                                         scada"
                             \dashv \vdash
                                            \leftarrow
                             Q1.7
                          "sludge
                           valve
                           filter2"
                             +
```

## Network: 8 sludge tank fill

```
"sludge L-
sensor
tank"

M6.2

"sludge H-
sensor
tank"

M6.2

M6.2

"sludge
tank
filling"
```

sludge motor clarifier timer operation  $% \left( 1\right) =\left( 1\right) \left( 1\right)$ 

Network: 9

T20 "clarifier before start t" T2 "clarifier I1.2 "LEVsencla T13 "factory T14 "start т3 "clarifier on time" system timer" rifier buttom" reset timer" 00.0 off time" "raw pump" CMP >I CMP >I S\_ODT S\_ODT Q MW80 S5T#50MS-MW54 -TV MW50 ΒI ΒI "sludge "sludge clarifier BCD BCD - MW58 clarifier off sca"-IN1 on sca"-IN1 0 -IN2 0 - IN2 FC33 S5 Time to IEC Time "S5TI\_TIM" DIV\_R ENO DI\_R ENO ENO OUT - MD70 MD62-IN OUT - MD66 MW58-IN RET\_VAL - MD62 MD66 -IN1 1.000000e+ 003 -IN2 T3 "clarifier "clarifier off time" on time" S\_ODT Q MW84 BI BCD - MW88 FC33 S5 Time to IEC Time "S5TI\_TIM" DI\_R DIV R MM88 —IN MD92-IN OUT - MD96 RET VAL - MD92 MD96 IN1 OUT - MD100 1.000000e+ 003-IN2 "sludge clarifier T2 Т3 "clarifier off time" "clarifier on time" relay" CMP <>I CMP <>I MW50 "sludge 08WM "sludge clarifier clarifier on sca"-IN1 off sca" -IN1 0 -IN2 0 - IN2 FC40
IEC Time to S5 Time
"TIM\_S5TI" MUL\_DI I\_DI\_ ENO LD50-IN1 OUT -LD54 RET VAL - MW54 "sludge clarifier 1000 - IN2 OUT - LD50 off sca" FC40
IEC Time to S5 Time MUL\_DI I\_DI "TIM\_S5TI" ENO ENO LD84 -IN MW80 LD80 IN1 OUT -LD84 RET\_VAL - MW84 "sludge 1000 - IN2 clarifier on sca" OUT - LD80 T18 M3.6 "clarifier "force force stop t" stop clarifier" S\_OFFDT  $\dashv$   $\vdash$ Q S5T#2S-TV ΒI BCD M0.2 T18 "sludge "sludge "clarifier force stop t" clarifier" relay" -1/1- $\dashv \vdash$  $\leftarrow$ M0.3 "test clarifier from scad" -+M0.1 "reset sludge clarifier" MOVE  $\vdash$ -EN ENO — 0 -IN "sludge clarifier OUT - off sca" MOVE EN ENO 0 IN "sludge clarifier OUT - on sca"

```
Network: 10
                    lighting system
    I1.4
"led
                      T13
                                     M4.4
                  "factory reset
                                   "force
                                                     Q1.5
"led"
   photo
                                    stop
                                   light"
                    timer"
   sensor"
                                     —//<del>-</del>
     + +
                                                      \leftarrow
 M1.1
"led test
    from
   scada"
    \dashv \vdash
```

```
Network: 11 treat tank 2
```

```
T13
                                         IO.5
                                                     T23
"treat 2
  T14
                             I1.2
            "factory
"start
                         "LEVsencla
              reset
timer"
system
                           rifier
                                         filter
                                                       dist."
                                                                      Q1.0
timer"
                           buttom"
                                         tank2"
                                                                    "treat2"
                                                        S_ODT
                                                                      \leftarrow
 +
                                                              Q
                                            S5T#3S-TV
                                                             ΒI
                                                            BCD -
                                                         T26
                                                       "enter
                                                                      Q0.6
                                                                    "enter valve
                                                      valve 2
timer"
                                                                   filter2"
                                                        S_ODT
                                                                      \leftarrow
                                            S5T#2S-TV
                                                             вІ
                                                            BCD-
                                                        M1.4
                                                      "traet
                                                       pipe
color"
                                           Q1.0
                                         "treat2"
                                                         \leftarrow
                                           Q0.7
                                         "treat1"
                                          +
```

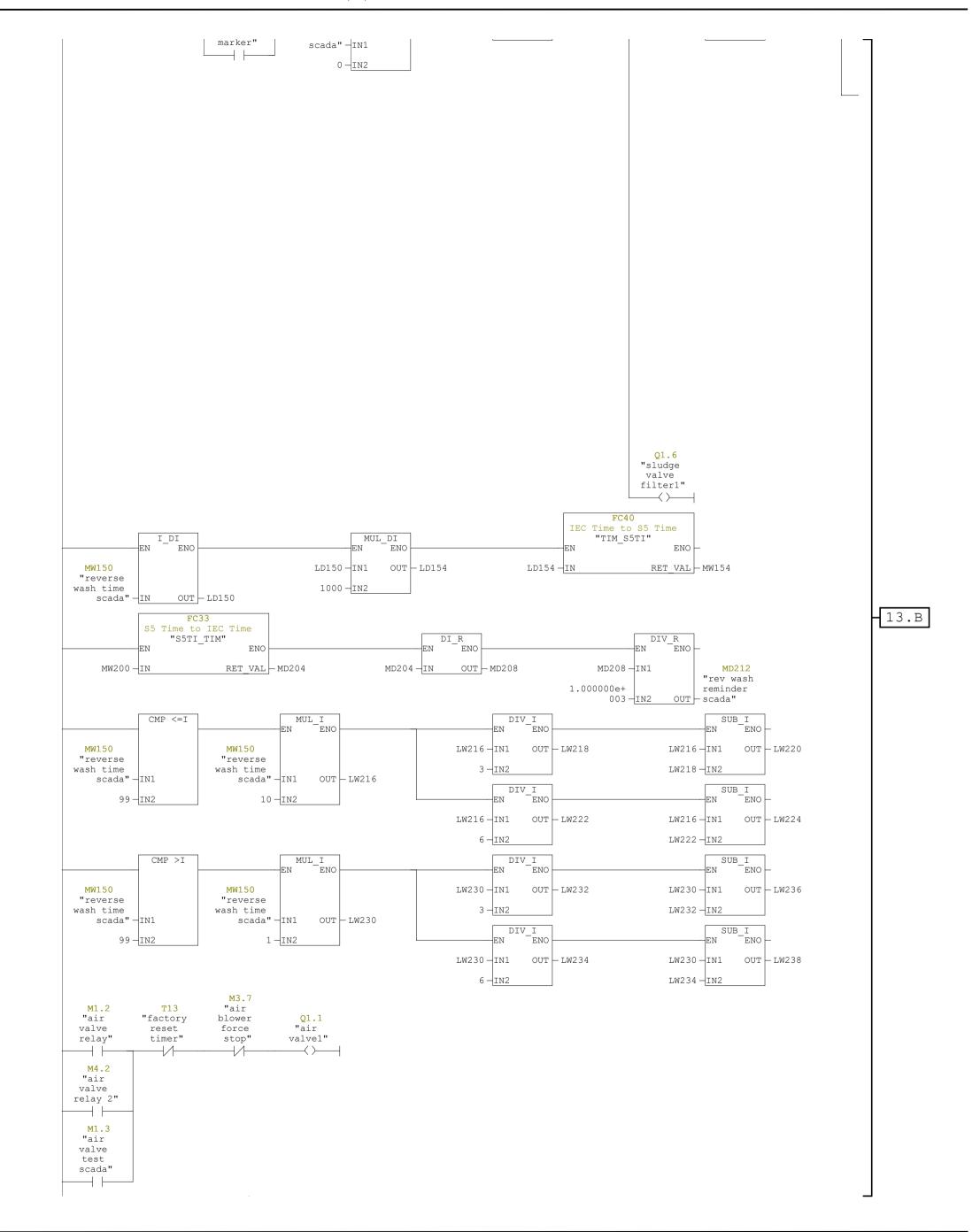
```
Network: 12 filter-1 high signal
```

```
10.3
                                                   M2.6
                                  I0.4
                 "low
                                 "high
                                                "filter
M0.0
"PLC OK"
                filter
tank1"
                                filter
                                               tank H-L
                                                 relay"
                                 tank1"
  \dashv \vdash
                   +
                                   \dashv \vdash
                                                    \leftarrow
                                  M2.6
                                "filter
                               tank H-L
                                 relay"
                                  \dashv \vdash
```

Network: 13

treat tank 1

```
T10
                                                           "enter
  T14
                 T13
                               I1.2
                                                          valve 1
                                                                            Q0.5
                                               Т4
                                                           delay
time"
"start
             "factory
                           "LEVsencla
                                            "high
                                                                          "enter
              reset
timer"
system
                             rifier
                                            treat
                                                                          valve
                                                                         filter1"
timer"
                             buttom"
                                          tank dist"
                                                            S_ODT
                 1/
 \dashv \vdash
                                \dashv \vdash
                                                                            \leftarrow
                                                S5T#2S-TV
                                                                  ΒI
                                                                 BCD
                                                           T4
"high
                                              M2.6
                                           "filter
                                                           treat
                                           tank H-L
                                                         tank dist"
                                            relay"
                                                            S_ODT
                                              \dashv \vdash
                                                                   Q
                                               S5T#2S-
                                                                  ΒI
                                                                 BCD-
                                                            IO.3
                                              Q0.5
                                                                                           T13
                                                                                                          Т9
                                            "enter
                                                                          "high
                                                                                       "factory
                                                                                                       "treat1
                                                          filter
tank1"
                                                                                                                      Q0.7
"treat1"
                                           valve
filter1"
                                                                                         reset
timer"
                                                                                                        dist"
                                                                          treat
                                                                       tank dist"
                                                                                                         S ODT
                                             \dashv \vdash
                                                                                           +\!\!\!/\!\!\!/
                                                                                                                        \prec
                                              M6.0
                                                                            M6.0
                                                                                            S5T#2S-TV
                                                                                                              ΒI
                                             "No
                                                                           "No
                                           restart
marker"
                                                                         restart
                                                                                                             BCD
                                                                         marker"
                                                                            T30
                                                                         "before
                                               Т5
                                            "wash
                                                                         restart
                                            timer
                                                                         message'
                                           process"
                                                                           S_ODT
                                              \dashv \vdash
                                                           S5T#500MS-TV
                                                                                 ΒI
                                                                                BCD-
                                                                            T31
                                                                         "rewash
                                                             M6.0
                                                                          wait
                                                             "No
                                                                          alarm
                                                          restart
marker"
                                                                          timer"
                                                             \dashv \land
                                                                                  Q
                                                                                                                                                                                    13.A
                                                             S5T#10S-TV
                                                                                 BI
                                                                                BCD
                                               T30
                                                             M5.7
                                                                            I0.3
                                                                                          M6.0
                                           "before
                                                             "No
                                                                          "low
                                                                                          "No
                                           restart
                                                          restert
                                                                          filter
                                                                                        restart
                                           message"
                                                           scada"
                                                                          tank1"
                                                                                        marker"
                                              \dashv \vdash
                                                                                           \leftarrow \succ
                                              M6.0
                                              "No
                                           restart
                                            marker"
                                              T31
                                           "rewash
                                            wait
                                            {\tt alarm}
                                            timer"
                                             \dashv
                                               T30
                                                             M6.0
                                                                           M5.6
                                           "before
                                                             "No
                                                                        "restart
                                           restart
                                                          restart
                                                                         reverse
                                                           marker"
                                           message"
                                                                        wash sca"
                                                             1/-
                                                                            \leftarrow
                                             \dashv \vdash
                                              M5.5
                                                              Т5
                                                                            M6.4
                                            "start
                                                           "wash
                                                                          "start
                                           reverse
                                                           timer
                                                                          now
                                          now scada"
                                                          process"
                                                                         marker"
                                                             1/
                                              \dashv \vdash
                                                                            \prec \succ
                                              M6.4
                                            "start
                                             now
                                                                                                                                                       Т8
                                                                                                                                                     delay
time
                                                                                                          T21
                                                                                                                                                    before
                                                                                                       "timer
                                                                                                                                       M8.0
"y⋅
                                                                                                                                                     start
                                                                                                                                                    washing
                                               T4
                                                                                                       before
                                                                                                                                                  "before wash time"
                                            "high
                                                                                                        wash
                                                                                                                                    restart
                                                                                                       proces"
                                            treat
                                                                                                                                   rev wash
                                                                                                                                     scada"
                                          tank dist"
                                                                          CMP >I
                                                                                                        S_ODT
                                                                                                                                                     S_ODT
                                                                                                                                       -1/1-
                                             \dashv \vdash
                                                                                                                                                            Q
                                              M6.4
                                                            MW150
                                                                                            S5T#1S-TV
                                                                                                                                         S5T#1S-TV
                                                                                                              ΒI
                                                                                                                                                           ΒI
                                            "start
                                                           "reverse
                                             now
                                                          wash time
                                                                                                             BCD
                                                                                                                                                          BCD
```

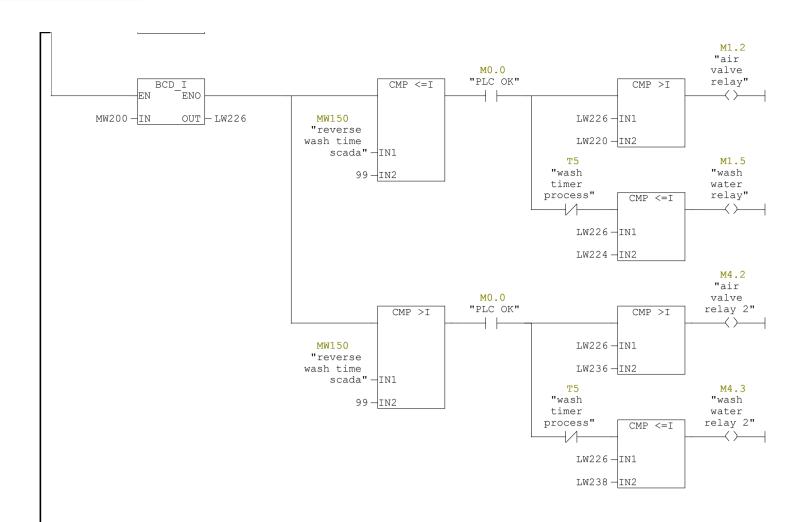


```
M4.0
"wash
pump
force
stop"
                     T13
"factory
reset
timer"
  M1.5
"wash
                                                                   Q1.2
"wash
water1"
 water
relay"
                                                                      \longrightarrow
   \dashv \vdash
                          M4.3
"wash
water
relay 2"
                                                                                                                                                                                                                                                             13.C
  \dashv \vdash
 M1.6
"wash
 water
 test
scada"
   \dashv \vdash
```

13.A T5
"wash
timer
process"
S\_ODT Q1.6 "sludge valve filter1" MW154 -TV ΒI BCD - MW200

SIMATIC

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13.B

13.C

SIMATIC

```
M1.7
                                          "zero
               I0.4
              "high
                                         washing
 M0.0
             filter
                                          time
"PLC OK"
                                         messag"
              tank1"
                           CMP ==I
 \dashv \vdash
                                            \leftarrow \succ
               MW150
              "reverse
             wash time
                 scada" -IN1
                       0 -IN2
               I1.2
                                                                       M2.0
            "LEVsencla
                                                                     "sludge
             rifier
                                                                      time
                                                                    message"
             buttom"
                           CMP ==I
                                                       CMP ==I
                                                                        \prec \succ
               MW50
                                           08WM
               "sludge
                                           "sludge
            clarifier
                                         clarifier
               off sca"-IN1
                                            on sca"-IN1
                       0 -IN2
                                                   0 -IN2
                                            T31
                T30
                             I0.4
                                         "rewash
                                                         M6.1
             "before
                            "high
                                          wait
                                                      "reverse
                           filter
             restart
                                          {\tt alarm}
                                                     wash wait
                           tank1"
            message"
                                          timer"
                                                       messag"
                                            1/1
                                                          \prec \succ
                                           M6.3
               I0.6
                                        "emeergenc
            "emergency pressed"
                                        for scad"
                                            \prec \succ
                                            T25
                                        "raw pump
                             I0.2
                                                         M3.0
                          "raw pump
                                        feedback
                                                      "raw pump
                                          timer"
                                                      feedback
               Q0.0
                             run
            "raw pump"
                         feedback"
                                                        alarm"
                                          S_ODT
                                                          \prec \succ
                                                 Q
                               S5T#2S-
                                                ВΙ
                                               BCD
                                            T24
                                         "flash
                             12.0
                                                         M5.3
                                         mixer
             Q0.2
"flash
                           "flash
                                        feedback
                                                       "flash
                           mixer
                                           tim"
                                                      feedback
                          feedback"
             mixer"
                                                        alarm"
                                          S_ODT
                              1/1
                               S5T#2S-
                                                ВΙ
                                               BCD
                                            T11
                             12.1
                                          "slow
                                                         M6.7
                            "slow
                                                        "slow
               Q0.3
                                        feedback
              "slow
                           mixer
                                          timer"
                                                      feedback
              mixer"
                          feedback"
                                                        alarm"
                                          S_ODT
                              1/1
                +
                                                          \leftarrow
                               S5T#2S-TV
                                                ВΙ
                                               BCD
                                            T15
                                       "clarifier feedback
                                                         M7.0
               Q0.4
            "sludge
                                                      "clarifier
                             I2.2
                          "clarifier
                                          timer"
                                                       feedback
             motor
            clarifier"
                          feedback"
                                                        alarm"
                                          S_ODT
                              1/1-
                                                 Q
                               S5T#2S-
                                                ΒI
                                               BCD
                                            T16
                                         "blower
                                                         M7.1
              Q1.1
"air
                                                       "blower
                             12.3
                                        feedback
                           "blower
                                          timer"
                                                      feedback
             valve1"
                          feedback"
                                                        alarm"
                                          S_ODT
                              +\!\!\!/\!\!\!/
                                                         \prec \succ
                               S5T#2S-TV
                                                ΒI
                                               BCD -
                                            T22
                             12.4
                                          "wash
               Q1.2
                            "wash
                                        feedback
             "wash
                           water
                                         timer"
                                                      feedback
             water1"
                          feedback"
                                                       alarm"
                                          S ODT
                              1/
                                                         \leftarrow
                               S5T#2S-TV
                                                ΒI
                                               BCD
               I2.5
             "flash
                                           M7.3
```

Network: 14

alarms

```
"flash
  mixer
                           over flow
  over
 sensor"
                             alarm"
                               \prec \succ
                               T12
                             "delay
  M1.7
"zero
                 T13
                              time
 washing
              "factory
                             before
               reset
timer"
  time
                             alarm"
 messag"
                              S_ODT
   \dashv
                                     Q
   M2.0
                   S5T#2S-TV
                                    ΒI
 "sludge
  time
                                   BCD-
 message"
    +
   M3.0
"raw pump
feedback
 alarm"
   M6.3
"emeergenc
y mode
for scad"
 I2.5
"flash
 mixer
  over
 sensor"
   +
   T12
 "delay
                 M2.2
               "reset
  time
 before
              hardware
                               Q1.4
                              "alarm"
 alarm"
               alarm"
    +
                  1/
                               \prec \succ
   M3.0
                 M2.1
                               M2.2
"raw pump
               "reset
                             "reset
feedback
                            hardware
               alarm
 alarm"
                scada"
                             alarm"
 M5.3
"flash
                 M2.2
               "reset
feedback
              hardware
  alarm"
               alarm"
                 +
    +
   M6.7
  "slow
feedback
 alarm"
   +
M7.0
"clarifier
 feedback
 alarm"
    +
M7.1
"blower
feedback
 alarm"
   \dashv \vdash
   M7.2
  "wash
feedback
 alarm"
   M3.5
 "force
 stop
sludge
                               M2.3
                           "alarm on
  pump"
                             scada"
   \dashv \vdash
                               \leftarrow
   M3.4
 "force
stop slow
 mixer"
   +
   M3.3
 "force
  stop
  flash
   +
   M3.6
 "force
stop
clarifier"
  -+
   M3.7
  "air
 blower
 force
stop"
   \dashv \vdash
   M4.0
```

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```
"wash
   pump
force
    stop"
      \dashv \vdash
      T12
  "delay
  before alarm"
    \dashv
M6.1
"reverse
wash wait
 messag"
      +
M6.3
"emeergenc
y mode
for scad"
  M3.1
"force
stop raw
pump"
      \dashv
M3.0
"raw pump
feedback
  alarm"
M5.3
"flash
feedback
  alarm"
      \dashv \vdash
M6.7
"slow
feedback
  alarm"
     \dashv \vdash
M7.0
"clarifier
feedback
alarm"
M7.1
"blower
feedback
alarm"
      \dashv \vdash
M7.2
"wash
feedback
alarm"
      \dashv \vdash
  I2.5
"flash
   mixer
   over
  sensor"
```

Network: 15 plant reset

 $\dashv$   $\vdash$ 

```
T13
"factory
   M2.4
"factory
reset
scada"
                               reset
timer"
                               S_OFFDT
   \dashv \vdash
                    S5T#4S-TV
                                      ΒI
                                     BCD
                                 MOVE
                          0 -IN
                                                MW150
                                            "reverse
                                            wash time
                                     OUT — scada'
                             MOVE
                                   ENO
                          0 -IN
                                          "sludge
clarifier
                            MOVE
EN EI
                                  ENO
                          0 -IN
                                               MW80
                                     "sludge
clarifier
OUT on sca"
```

SIMATIC 300(1)\CPU 314C-2 DP\...\OB1 - <offline>

SIMATIC