

FB112 - <offline>

```

"FB_VerticaalConveyor"      Verticaal conveyor
Name:                        Family:
Author:  JA                  Version: 0.1
                               Block version: 2
Time stamp Code:            09/09/2014 08:10:51 AM
                               Interface:
                               04/07/2014 09:12:25 AM
Lengths (block/logic/data): 01848 01360 00014

```

Name	Data Type	Address	Initial Value	Comment
oFaultProdReleaseSensor	Bool	34.7	FALSE	Fault sensor product release (sensor not triggered)
oFaultProductOnOutfeed	Bool	35.0	FALSE	Fault product on outfeed conveyor present
oFaultProductInfeedtime	Bool	35.1	FALSE	Fault Overtime box inserted
oFaultMonitorRotation	Bool	35.2	FALSE	
IN_OUT		0.0		
STAT		0.0		
sDelayForwardReverse	TON	36.0		
sDelayRelease	TOF	58.0		
sTimeDelayInfeed_B7	TON	80.0		
sTimeMonitorInfeed	TON	102.0		
sDelayProrunnerEmpty	TON	124.0		
sDelayCheckOutfeed	TOF	146.0		
sTimeCheckReleaseSensor	TON	168.0		
sTimeCheckTimeFrameSenso	TON	190.0		
sTimeMonitorRotation	TON	212.0		
sTimeDelayMonitotRotatio	TON	234.0		
sCounters	Struct	256.0		
CountedProducts	DInt	256.0	L#0	
sHM_FP	Struct	260.0		
Reset	Bool	260.0	FALSE	
ProductRelease	Bool	260.1	FALSE	
CheckRotation	Bool	260.2	FALSE	
CheckDropOffPosition	Bool	260.3	FALSE	
sHM_FN	Struct	262.0		
ProductReleased	Bool	262.0	FALSE	
ProductLeftOutfeed_B9	Bool	262.1	FALSE	
CheckRotation	Bool	262.2	FALSE	
TimeFrameOutfeed	Bool	262.3	FALSE	
sManualActive	Bool	264.0	FALSE	
sProductOnOutfeed	Bool	264.1	FALSE	
sStopLiftProdOnOutfeed	Bool	264.2	FALSE	
sEmptyVerticaalConveyor	Bool	264.3	FALSE	
sProductInserted	Bool	264.4	FALSE	
sExtendedRelease	Bool	264.5	FALSE	
TEMP		0.0		
tAutomaticTerms	Bool	0.0		
tAutomatic	Bool	0.1		
tManual	Bool	0.2		
tSignalToDelay	Bool	0.3		
tEnableMotorOn	Bool	0.4		
tEnableMotorForward	Bool	0.5		
tEnableMotorReverse	Bool	0.6		
tProrunnerRunning	Bool	0.7		
tProrunnerRotating	Bool	1.0		

Name	Data Type	Address	Initial Value	Comment
tMonitorRotatioEnabled	Bool	1.1		
tFP	Struct	2.0		
Reset	Bool	2.0		
Productrelease	Bool	2.1		
CheckDropOffPosition	Bool	2.2		
CheckRotation	Bool	2.3		
tFN	Struct	4.0		
ProductReleased	Bool	4.0		
ProductLeftOutfeed_B9	Bool	4.1		
CheckRotation	Bool	4.2		
TimeFrameOutfeed	Bool	4.3		

Block: FB112 Verticaal conveyor

When Init is activated, the prorunner must be empty.
all memory bits will be reset and the prorunner will start all over.

Network: 1 Init

```
A      #iInit          #iInit          -- Initialising the Prorunner
JCN    NoIn

SET
R      #sProductOnOutfeed      #sProductOnOutfeed
R      #sEmptyVerticaalConveyor #sEmptyVerticaalConveyor
R      #sProductInserted       #sProductInserted
R      #sStopLiftProdOnOutfeed  #sStopLiftProdOnOutfeed

NoIn: NOP    0
```

Network: 2 Reset

```
A      #iReset      #iReset      -- Pushbutton Reset
FP      #sHM_FP.Reset  #sHM_FP.Reset
=      #tFP.Reset     #tFP.Reset
```

Network: 3 Release manual/automatic

```
A      #iEnableAutomatic      #iEnableAutomatic -- Enable mode automatic
A      #iEnableElevator        #iEnableElevator  -- Enable clearence emergengystop, thermal etc.
AN     #iEnableManual          #iEnableManual    -- FALSE = Mode manual, TRUE = Mode automatic
=      #tAutomaticTerms        #tAutomaticTerms

A      #tAutomaticTerms        #tAutomaticTerms
AN     #oFaultMonitorRotation  #oFaultMonitorRotation
AN     #oFaultProdReleaseSensor #oFaultProdReleaseSensor -- Fault sensor product release (sensor not
trigged)
AN     #oFaultTimeFrameSensor  #oFaultTimeFrameSensor -- Fault Time frame sensor (sensor not trigger
ed)
AN     #sEmptyVerticaalConveyor #sEmptyVerticaalConveyor
=      #tAutomatic            #tAutomatic

A      #iEnableElevator        #iEnableElevator  -- Enable clearence emergengystop, thermal etc.
A      #iEnableManual          #iEnableManual    -- FALSE = Mode manual, TRUE = Mode automatic
AN     #iManualForward         #iManualForward  -- Pushbutton Manual forward (normal run)
```

```
AN    #iManualReverse      #iManualReverse    -- Pushbutton Manual reverse
S     #sManualActive       #sManualActive

ON    #iEnableElevator     #iEnableElevator   -- Enable clearence emergengystop, thermal etc.
ON    #iEnableManual       #iEnableManual     -- FALSE = Mode manual, TRUE = Mode automatic
R     #sManualActive       #sManualActive

A     #sManualActive       #sManualActive
AN    #oFaultMonitorRotation #oFaultMonitorRotation
=     #tManual             #tManual
```

Network: 4	Empty verticaal conveyor
------------	--------------------------

```
AN    #iProductReadyForInfeed #iProductReadyForInfeed -- Photocel in front of infeed
AN    #iEndInfeedConveyor_B7  #iEndInfeedConveyor_B7 -- Photocell on infeedconveyor
AN    #iProductOnOutfeed_B8    #iProductOnOutfeed_B8 -- Dropoff position diagonal occupied
AN    #iProductLeftOutfeed_B9  #iProductLeftOutfeed_B9 -- Dropoff position straight occupied
A     #oProrunnerForward      #oProrunnerForward -- Forward vertical conveyor
=     #tProrunnerRunning      #tProrunnerRunning

CALL  #sDelayProrunnerEmpty    #sDelayProrunnerEmpty
IN:=#tProrunnerRunning        #tProrunnerRunning
PT:=#iEmptyTimeEnabled        #iEmptyTimeEnabled -- Empty time enabled
Q :=#sEmptyVerticaalConveyor  #sEmptyVerticaalConveyor
ET:=

A     #sEmptyVerticaalConveyor #sEmptyVerticaalConveyor
S     #oProrunnerIsEmpty      #oProrunnerIsEmpty -- Vertical conveyor is empty

A     #iProductReadyForInfeed  #iProductReadyForInfeed -- Photocel in front of infeed
O     #iEndInfeedConveyor_B7   #iEndInfeedConveyor_B7 -- Photocell on infeedconveyor
O     #iProductOnOutfeed_B8    #iProductOnOutfeed_B8 -- Dropoff position diagonal occupied
O     #iProductLeftOutfeed_B9  #iProductLeftOutfeed_B9 -- Dropoff position straight occupied
R     #oProrunnerIsEmpty      #oProrunnerIsEmpty -- Vertical conveyor is empty
```

Network: 5	Monitoring outfeed conveyor for next carrier
------------	--

When a product is put on the outfeedconveyor, it must be put in photocel -B8.
this photocell sets a memory bit, so the software knows there is a product
present on the outfeed conveyor even if this product is not in the photcell -B8
anymore.
The product will travel in photocell -B9, and on a negative edge of this
photocell the memory bit is reset.
When the next carrier of the Prorunner activates sensor -B3 a time frame will
start. when this time is past and the memory bit ProductOnOutfeed is still
present, the Prorunner must stop until this memory bit is reset.

```
A     #iStartTimeFrame_B3      #iStartTimeFrame_B3 -- Sensor Forksecurity for outfeed
FP    #sHM_FP.CheckDropOffPosition #sHM_FP.CheckDropOffPosition
=     #tFP.CheckDropOffPosition #tFP.CheckDropOffPosition

CALL  #sDelayCheckOutfeed      #sDelayCheckOutfeed
IN:=#tFP.CheckDropOffPosition  #tFP.CheckDropOffPosition
PT:=#iTimeCheckOutfeed        #iTimeCheckOutfeed -- Time off delay on B3, when time is past ou
                                tfeed must be empty, if not lift stop
Q :=#sDelayCheckOutfeed.Q      #sDelayCheckOutfeed.Q
ET:=

A     #sDelayCheckOutfeed.Q     #sDelayCheckOutfeed.Q
FN    #sHM_FN.TimeFrameOutfeed  #sHM_FN.TimeFrameOutfeed
=     #tFN.TimeFrameOutfeed     #tFN.TimeFrameOutfeed

A     #iProductLeftOutfeed_B9   #iProductLeftOutfeed_B9 -- Dropoff position straight occupied
FN    #sHM_FN.ProductLeftOutfeed_B9 #sHM_FN.ProductLeftOutfeed_B9
=     #tFN.ProductLeftOutfeed_B9 #tFN.ProductLeftOutfeed_B9

A     #iProductOnOutfeed_B8     #iProductOnOutfeed_B8 -- Dropoff position diagonal occupied
O     #iProductLeftOutfeed_B9   #iProductLeftOutfeed_B9 -- Dropoff position straight occupied
```

```

S      #sProductOnOutfeed      #sProductOnOutfeed

AN     #iProductOnOutfeed_B8    #iProductOnOutfeed_B8 -- Dropoff position diagonal occupied
A      #tFN.ProductLeftOutfeed_B9 #tFN.ProductLeftOutfeed_B9
R      #sProductOnOutfeed      #sProductOnOutfeed

A      #sProductOnOutfeed      #sProductOnOutfeed
A      #tFN.TimeFrameOutfeed    #tFN.TimeFrameOutfeed
S      #sStopLiftProdOnOutfeed  #sStopLiftProdOnOutfeed

AN     #sProductOnOutfeed      #sProductOnOutfeed
R      #sStopLiftProdOnOutfeed  #sStopLiftProdOnOutfeed

AN     #sEmptyVerticaalConveyor #sEmptyVerticaalConveyor
A      #oOutfeedConveyor        #oOutfeedConveyor -- Outfeed conveyor in Prorunner
A      #sProductOnOutfeed      #sProductOnOutfeed
A      #tFN.TimeFrameOutfeed    #tFN.TimeFrameOutfeed
S      #oFaultProductOnOutfeed  #oFaultProductOnOutfeed -- Fault product on outfeed conveyor pre
                                sent

A      #iReset                  #iReset -- Pushbutton Reset
O(
AN     #sProductOnOutfeed      #sProductOnOutfeed
AN     #iProductOnOutfeed_B8    #iProductOnOutfeed_B8 -- Dropoff position diagonal occupied
AN     #iProductLeftOutfeed_B9  #iProductLeftOutfeed_B9 -- Dropoff position straight occupied
)
R      #oFaultProductOnOutfeed  #oFaultProductOnOutfeed -- Fault product on outfeed conveyor pre
                                sent

```

Network: 6	Delay rotation when changing rotation CW or CCW
------------	---

```

AN     #oProrunnerForward      #oProrunnerForward -- Forward vertical conveyor
AN     #oProrunnerReverse      #oProrunnerReverse -- Reverse vertical conveyor
=      #tSignalToDelay          #tSignalToDelay

CALL   #sDelayForwardReverse   #sDelayForwardReverse
IN:=#tSignalToDelay            #tSignalToDelay
PT:=T#1S
Q :=#tEnableMotorOn            #tEnableMotorOn
ET:=

O      #tEnableMotorOn          #tEnableMotorOn
O      #oProrunnerForward      #oProrunnerForward -- Forward vertical conveyor
=      #tEnableMotorForward     #tEnableMotorForward

O      #tEnableMotorOn          #tEnableMotorOn
O      #oProrunnerReverse      #oProrunnerReverse -- Reverse vertical conveyor
=      #tEnableMotorReverse     #tEnableMotorReverse

```

Network: 7	Motor verticaal conveyor
------------	--------------------------

```

A      #tAutomatic              #tAutomatic
AN     #oFaultProductInfeedtime #oFaultProductInfeedtime -- Fault Overtime box inserted
AN     #sStopLiftProdOnOutfeed  #sStopLiftProdOnOutfeed
A      #tEnableMotorForward     #tEnableMotorForward
O
A      #tManual                  #tManual
A      #tEnableMotorForward     #tEnableMotorForward
A      #iManualForward           #iManualForward -- Pushbutton Manual forward (normal run)
=      #oProrunnerForward       #oProrunnerForward -- Forward vertical conveyor

A      #tManual                  #tManual
A      #tEnableMotorReverse     #tEnableMotorReverse
A      #iManualReverse           #iManualReverse -- Pushbutton Manual reverse
=      #oProrunnerReverse       #oProrunnerReverse -- Reverse vertical conveyor

```

Network: 8 Release new product in Prorunner
--

```
A      #iProductRelease_B1      #iProductRelease_B1 -- Sensor infeedproduct
FP     #sHM_FP.ProductRelease    #sHM_FP.ProductRelease
=      #tFP.Productrelease       #tFP.Productrelease

A      #iProductReadyForInfeed   #iProductReadyForInfeed -- Photocel in front of infeed
FN     #sHM_FN.ProductReleased   #sHM_FN.ProductReleased
=      #tFN.ProductReleased      #tFN.ProductReleased

CALL   #sDelayRelease            #sDelayRelease
IN:=#tFP.Productrelease          #tFP.Productrelease
PT:=#iTimeInfeedAllowed          #iTimeInfeedAllowed -- Time of window infeed allowed
Q :=#sExtendedRelease            #sExtendedRelease
ET:=

A      #tFN.ProductReleased      #tFN.ProductReleased
JCN    pkvp

L      #sCounters.CountedProducts #sCounters.CountedProducts
+      L#1
T      #sCounters.CountedProducts #sCounters.CountedProducts
```

pkvp: NOP 0

Network: 9 Motor supply conveyor

```
A      #tAutomatic              #tAutomatic
A      #oInfeedConveyor         #oInfeedConveyor -- Infeed conveyor in Prorunner
AN     #sProductInserted        #sProductInserted
AN     #iEndInfeedConveyor_B7   #iEndInfeedConveyor_B7 -- Photocell on infeedconveyor
O
A      #tAutomatic              #tAutomatic
AN     #iProductReadyForInfeed   #iProductReadyForInfeed -- Photocel in front of infeed
=      #oSupplyConveyor         #oSupplyConveyor -- Supply conveyor before Prorunner
```

Network: 10 Motor infeed conveyor

```
CALL   #sTimeDelayInfeed_B7     #sTimeDelayInfeed_B7
IN:=#iEndInfeedConveyor_B7      #iEndInfeedConveyor_B7 -- Photocell on infeedconveyor
PT:=#iTimeProductOnInfeed       #iTimeProductOnInfeed -- Time for delay on B7
Q :=#sTimeDelayInfeed_B7.Q      #sTimeDelayInfeed_B7.Q
ET:=

A      #tAutomatic              #tAutomatic
AN     #oProrunnerIsEmpty       #oProrunnerIsEmpty -- Vertical conveyor is empty
AN     #sTimeDelayInfeed_B7.Q   #sTimeDelayInfeed_B7.Q
AN     #oFaultProductInfeedtime #oFaultProductInfeedtime -- Fault Overtime box inserted
=      #oInfeedConveyor         #oInfeedConveyor -- Infeed conveyor in Prorunner
```

Network: 11 Monitoring product infeed time
--

```
A      #tFN.ProductReleased      #tFN.ProductReleased
A      #tAutomatic              #tAutomatic
S      #sProductInserted         #sProductInserted

A      #sProductInserted         #sProductInserted
A(
O      #iEndInfeedConveyor_B7    #iEndInfeedConveyor_B7 -- Photocell on infeedconveyor
O      #tFP.Reset                #tFP.Reset
)
R      #sProductInserted         #sProductInserted
```

```
CALL #sTimeMonitorInfeed      #sTimeMonitorInfeed
IN:=#sProductInserted        #sProductInserted
PT:=#iTimeMonitorInfeed      #iTimeMonitorInfeed -- Time monitoring of product infeed
Q :=#sTimeMonitorInfeed.Q     #sTimeMonitorInfeed.Q
ET:=

A      #sTimeMonitorInfeed.Q   #sTimeMonitorInfeed.Q
S      #oFaultProductInfeedtime #oFaultProductInfeedtime -- Fault Overtime box inserted

A      #tFP.Reset              #tFP.Reset
O      #iEndInfeedConveyor_B7  #iEndInfeedConveyor_B7 -- Photocell on infeedconveyor
R      #oFaultProductInfeedtime #oFaultProductInfeedtime -- Fault Overtime box inserted
```

Network: 12	Motor outfeed conveyor
-------------	------------------------

```
A      #tAutomatic              #tAutomatic
AN      #oProrunnerIsEmpty      #oProrunnerIsEmpty -- Vertical conveyor is empty
A      #iDischargeConveyorReady #iDischargeConveyorReady -- input Discharge conveyor is running an re
=      #oOutfeedConveyor        #oOutfeedConveyor -- Outfeed conveyor in Prorunner
```

Network: 13	Monitoring product release and time frame sensor
-------------	--

```
A      #oProrunnerForward        #oProrunnerForward -- Forward vertical conveyor
A      #tAutomatic              #tAutomatic
AN      #iProductRelease_B1      #iProductRelease_B1 -- Sensor infeedproduct
AN      #oFaultProdReleaseSensor #oFaultProdReleaseSensor -- Fault sensor product release (sensor
=      #sTimeCheckReleaseSensor.IN #sTimeCheckReleaseSensor.IN

CALL #sTimeCheckReleaseSensor    #sTimeCheckReleaseSensor
IN:=#sTimeCheckReleaseSensor.IN  #sTimeCheckReleaseSensor.IN
PT:=#iTimeCheckSensors           #iTimeCheckSensors -- Delay check sensors in 0,1 sec.
Q :=#sTimeCheckReleaseSensor.Q   #sTimeCheckReleaseSensor.Q
ET:=

A      #sTimeCheckReleaseSensor.Q #sTimeCheckReleaseSensor.Q
S      #oFaultProdReleaseSensor    #oFaultProdReleaseSensor -- Fault sensor product release (sensor
not triggered)

A      #oProrunnerForward        #oProrunnerForward -- Forward vertical conveyor
A      #tAutomatic              #tAutomatic
AN      #iStartTimeFrame_B3      #iStartTimeFrame_B3 -- Sensor Forksecurity for outfeed
AN      #oFaultTimeFrameSensor    #oFaultTimeFrameSensor -- Fault Time frame sensor (sensor not tri
=      #sTimeCheckTimeFrameSenso.IN #sTimeCheckTimeFrameSenso.IN

CALL #sTimeCheckTimeFrameSenso    #sTimeCheckTimeFrameSenso
IN:=#sTimeCheckTimeFrameSenso.IN  #sTimeCheckTimeFrameSenso.IN
PT:=#iTimeCheckSensors           #iTimeCheckSensors -- Delay check sensors in 0,1 sec.
Q :=#sTimeCheckTimeFrameSenso.Q   #sTimeCheckTimeFrameSenso.Q
ET:=

A      #sTimeCheckTimeFrameSenso.Q #sTimeCheckTimeFrameSenso.Q
S      #oFaultTimeFrameSensor    #oFaultTimeFrameSensor -- Fault Time frame sensor (sensor not tri
gged)
```

Network: 14	check bottom sprocket for rotation
<p>Fist mak a positive and negative edge of the sensor on the bottom sprocket. The monitoring can be delayed at the start of the motor for a variable time. The monitoring can be disabled if time is 0 ms. When the monitoring is enabled the sensor resets the timer at every edge. When the time is past there is a fault warning and the Prorunner will stop rotating.</p>	

```

A      #iMonitorRotation      #iMonitorRotation -- Sensor on bottom sprocket(Not standard)
FP     #sHM_FP.CheckRotation  #sHM_FP.CheckRotation
=      #tFP.CheckRotation      #tFP.CheckRotation

A      #iMonitorRotation      #iMonitorRotation -- Sensor on bottom sprocket(Not standard)
FN     #sHM_FN.CheckRotation  #sHM_FN.CheckRotation
=      #tFN.CheckRotation      #tFN.CheckRotation

O      #oProrunnerForward     #oProrunnerForward -- Forward vertical conveyor
O      #oProrunnerReverse     #oProrunnerReverse -- Reverse vertical conveyor
=      #tProrunnerRotating     #tProrunnerRotating

CALL   #sTimeDelayMonitotRotatio  #sTimeDelayMonitotRotatio
IN:=#tProrunnerRotating          #tProrunnerRotating
PT:=#iTimeDelayMonitorRotatio    #iTimeDelayMonitorRotatio -- Time to delay monitor rotation at sta
rtup
Q :=#sTimeDelayMonitotRotatio.Q  #sTimeDelayMonitotRotatio.Q
ET:=

A(
L      #iTimeMonitorRotation    #iTimeMonitorRotation -- Time for monitoring of rotation bottom sp
rocket(0 = disabled)
L      T#0MS
<>I
)
A      #sTimeDelayMonitotRotatio.Q  #sTimeDelayMonitotRotatio.Q
=      #tMonitorRotatioEnabled     #tMonitorRotatioEnabled

A      #tProrunnerRotating        #tProrunnerRotating
A      #tMonitorRotatioEnabled    #tMonitorRotatioEnabled
A      #iEnableElevator           #iEnableElevator -- Enable clearence emergengystop, thermal et
c.
AN     #oFaultMonitorRotation     #oFaultMonitorRotation
AN     #iReset                    #iReset -- Pushbutton Reset
AN     #tFP.CheckRotation          #tFP.CheckRotation
AN     #tFN.CheckRotation          #tFN.CheckRotation
=      #sTimeMonitorRotation.IN    #sTimeMonitorRotation.IN

CALL   #sTimeMonitorRotation      #sTimeMonitorRotation
IN:=#sTimeMonitorRotation.IN      #sTimeMonitorRotation.IN
PT:=#iTimeMonitorRotation         #iTimeMonitorRotation -- Time for monitoring of rotation bottom sp
rocket(0 = disabled)
Q :=#sTimeMonitorRotation.Q       #sTimeMonitorRotation.Q
ET:=

A      #sTimeMonitorRotation.Q     #sTimeMonitorRotation.Q
S      #oFaultMonitorRotation      #oFaultMonitorRotation

A      #tFP.Reset                 #tFP.Reset
R      #oFaultMonitorRotation      #oFaultMonitorRotation

```

Network: 15		Reset failures
A	#tFP.Reset	#tFP.Reset
R	#oFaultProdReleaseSensor	#oFaultProdReleaseSensor -- Fault sensor product release (sensor not triggered)
R	#oFaultTimeFrameSensor	#oFaultTimeFrameSensor -- Fault Time frame sensor (sensor not triggered)
R	#oFaultProductOnOutfeed	#oFaultProductOnOutfeed -- Fault product on outfeed conveyor present

R #oFaultProductInfeedtime #oFaultProductInfeedtime -- Fault Overtime box inserted