



Supplementary Document to the Interroll MultiControl User Manual Firmware version 1.2

- ZPA
- I/O device
- Teach-in

This document is valid only in connection with the "Interroll MultiControl" User Manual 2.2
(06/2016)



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Product description

A MultiControl can control up to four RollerDrives with different speed levels, accelerations, and decelerations. Depending on the number of configured outputs, up to eight inputs can be interpreted.

The integrated programs of the MultiControl permit zero pressure accumulation conveying. Each MultiControl controls up to four zones. One zone corresponds to a conveyor section consisting of RollerDrive, rotating rollers, and the corresponding sensors and switches. Depending on the program selected, it is possible to assign up to three slave RollerDrives.

The single release program makes zero pressure accumulation conveying possible, because the zones hold back the goods being conveyed until the logic detects the subsequent zone to be "free". If the goods being conveyed begin to accumulate, a signal is sent to the upstream zone, which causes the goods being conveyed to be held back. There is always a gap between the goods being conveyed; there is no pressure accumulation.

If the ZPA programs (zero pressure accumulation) are not used, then the MultiControl can work as an I/O device.

The combination of a MultiControl and the associated zones, RollerDrive, and sensors is referred to as a "module".

To configure larger conveying systems, multiple modules can be linked together. For this purpose, different IP addresses are assigned to the MultiControls. The connection to additional conveying systems is done by means of configurable inputs/outputs. The data interchange with a master control system (PLC) is provided via the field bus systems "PROFINET", "EtherNet/IP", or "EtherCat".

The MultiControl has an integrated web server, which generates a user interface for configuration of the MultiControl. On a computer connected to the MultiControl, this user interface can be called up in a web browser.

Except for a web browser, no other software has to be installed on the computer.

Use

- ZPA function (zero pressure accumulation) for straight segments and curves
- Start/stop function
- Single release
- Train release
- I/O device without ZPA functions
- Fault analysis
- For EtherCat is only I/O device available.



Network settings in the web browser

| | | | |
|---|--|---|--|
| Bus protocol <input type="radio"/> EtherCAT <input checked="" type="radio"/> PROFINET <input type="radio"/> EtherNet/IP | | Neighbours IP address upstream : <input type="text" value="0.0.0.0"/> IP address downstream : <input type="text" value="0.0.0.0"/> IP address side 1 : <input type="text" value="0.0.0.0"/> IP address side 2 : <input type="text" value="0.0.0.0"/> IP address transfer 1 : <input type="text" value="0.0.0.0"/> IP address transfer 2 : <input type="text" value="0.0.0.0"/> IP address transfer 3 : <input type="text" value="0.0.0.0"/> IP address transfer 4 : <input type="text" value="0.0.0.0"/> | |
| Addresses IP address : <input type="text" value="192.168.0.1"/> Network mask : <input type="text" value="255.255.255.0"/> Gateway : <input type="text" value="0.0.0.0"/> | | | |
| Domains Host name : <input type="text" value="multicontrol"/> Domain name : <input type="text"/> DNS server 1 : <input type="text" value="0.0.0.0"/> DNS server 2 : <input type="text" value="0.0.0.0"/> | | Options <input type="checkbox"/> Big Endian Format | |
| Configuration mode <input checked="" type="radio"/> Static <input type="radio"/> I/O Controller | | | |

If the MultiControl is to be connected to a master control system, the associated “bus protocol” must be selected.

As delivered, the IP address of the MultiControl is 192.168.0.1; it can be changed in the field “IP address”.

All MultiControls must be in the same sub-network; the default setting is 255.255.255.0.

This makes it theoretically possible to set up a conveyor with 253 MultiControls.

For larger conveyors, the “network mask” can be adjusted accordingly.

In the field “Domains-/-Host name”, a name is assigned to the MultiControl. The default name is MultiControl.

The default setting of the “configuration mode” is “static”.

The position in the conveying system is determined under “neighbours”.

“Neighbuors / IP address upstream” is the left neighbor.

“Neighbours / IP address downstream” is the right neighbor.

Additional functions can be used only in connection with Interroll 24V conveyor modules.
(See additional user manual.)

For communication among multiple MultiControls, it is necessary to connect them together with a PROFINET network cable, even if no master control system is used.

Note:

Altered parameters must be transferred to the MultiControl by hitting the “Submit” button.



Example: Conveyor with three MultiControls

First MultiControl

| | |
|---|---------------|
| Bus protocol | |
| <input type="radio"/> EtherCAT | |
| <input checked="" type="radio"/> PROFINET | |
| <input type="radio"/> EtherNet/IP | |
| Addresses | |
| IP address : | 192.168.0.20 |
| Network mask : | 255.255.255.0 |
| Gateway : | 0.0.0.0 |
| Domains | |
| Host name : | multicontrol |
| Domain name : | |
| DNS server 1 : | 0.0.0.0 |
| DNS server 2 : | 0.0.0.0 |
| Configuration mode | |
| <input checked="" type="radio"/> Static | |
| <input type="radio"/> I/O Controller | |

| | |
|--|--------------|
| Neighbours | |
| IP address upstream : | 0.0.0.0 |
| IP address downstream : | 192.168.0.21 |
| IP address side 1 : | 0.0.0.0 |
| IP address side 2 : | 0.0.0.0 |
| IP address transfer 1 : | 0.0.0.0 |
| IP address transfer 2 : | 0.0.0.0 |
| IP address transfer 3 : | 0.0.0.0 |
| IP address transfer 4 : | 0.0.0.0 |
| Options | |
| <input type="checkbox"/> Big Endian Format | |

IP address of the MultiControl 192.168.0.20

IP address upstream 0.0.0.0

IP address downstream 192.168.0.21

Second MultiControl

| | |
|---|---------------|
| Bus protocol | |
| <input type="radio"/> EtherCAT | |
| <input checked="" type="radio"/> PROFINET | |
| <input type="radio"/> EtherNet/IP | |
| Addresses | |
| IP address : | 192.168.0.21 |
| Network mask : | 255.255.255.0 |
| Gateway : | 0.0.0.0 |
| Domains | |
| Host name : | multicontrol |
| Domain name : | |
| DNS server 1 : | 0.0.0.0 |
| DNS server 2 : | 0.0.0.0 |
| Configuration mode | |
| <input checked="" type="radio"/> Static | |
| <input type="radio"/> I/O Controller | |

| | |
|--|--------------|
| Neighbours | |
| IP address upstream : | 192.168.0.20 |
| IP address downstream : | 192.168.0.22 |
| IP address side 1 : | 0.0.0.0 |
| IP address side 2 : | 0.0.0.0 |
| IP address transfer 1 : | 0.0.0.0 |
| IP address transfer 2 : | 0.0.0.0 |
| IP address transfer 3 : | 0.0.0.0 |
| IP address transfer 4 : | 0.0.0.0 |
| Options | |
| <input type="checkbox"/> Big Endian Format | |

IP address of the MultiControl 192.168.0.21

IP address upstream 192.168.0.20

IP address downstream 192.168.0.22

Third MultiControl

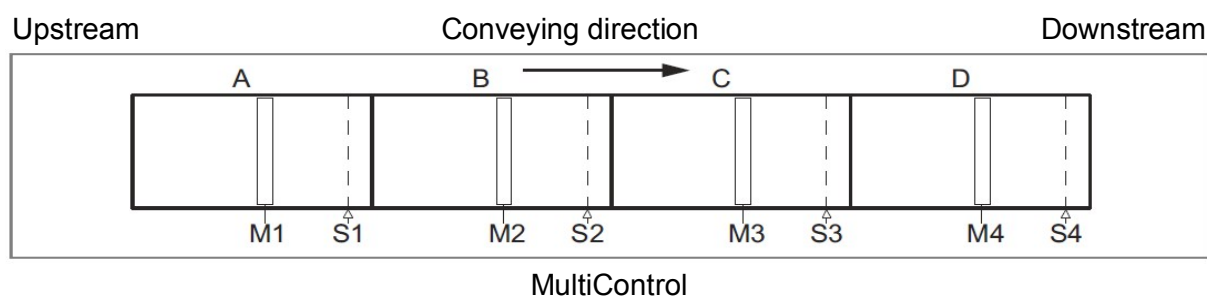
| | | | |
|--|--|---|--|
| Bus protocol <input type="radio"/> EtherCAT <input checked="" type="radio"/> PROFINET <input type="radio"/> EtherNet/IP | | Neighbours IP address upstream : 192.168.0.21 IP address downstream : 0.0.0.0 IP address side 1 : 0.0.0.0 IP address side 2 : 0.0.0.0 IP address transfer 1 : 0.0.0.0 IP address transfer 2 : 0.0.0.0 IP address transfer 3 : 0.0.0.0 IP address transfer 4 : 0.0.0.0 | |
| Addresses IP address : 192.168.0.22 Network mask : 255.255.255.0 Gateway : 0.0.0.0 | | | |
| Domains Host name : multicontrol Domain name : DNS server 1 : 0.0.0.0 DNS server 2 : 0.0.0.0 | | | |
| Configuration mode <input checked="" type="radio"/> Static <input type="radio"/> I/O Controller | | Options <input type="checkbox"/> Big Endian Format | |

IP address of the MultiControl 192.168.0.22

IP address upstream 192.168.0.21

IP address downstream 0.0.0.0

ZPA programs with stop function



S1–S4 = zone sensors, M1–M4 = RollerDrive, A–D = Zone 1–Zone 4

Single release

In the ZPA programs, one MultiControl can control up to four zones. Each zone can be stopped via an input or an PLC.

The conveying process is carried out from upstream to downstream; here from left to right. For a conveying direction from right to left, the MultiControl should be installed on the opposite side of the conveyor. The start zone is always Zone 1; it is not possible to define Zone 2 as start zone.

Depending on the control program selected, the sensors and motors are assigned.

| Number of zones | Control program | Assigned sensors and motors |
|-----------------|--------------------------|--|
| 1 | 1fachStauplatz_Zone_Stop | S1 (for M1, M2, M3, M4) |
| 2 | 2fachStauplatz_Zone_Stop | S1 (for M1 + M3), S2 (for M2 + M4) |
| 3 | 2fachStauplatz_Zone_Stop | S1 (for M1), S2 (for M2), S3 (for M3) |
| 4 | 4fachStauplatz_Zone_Stop | S1 (for M1), S2 (for M2), S3 (for M3), S4 (for M4) |

Free RollerDrive connections can be used as slave motors, as shown in the table.

If there is an active stop signal, the goods to be conveyed are still transported to the zone sensor. The RollerDrive is not stopped immediately. The goods to be conveyed are transported further after the stop signal has been reset, if the downstream zone is free. If the goods to be conveyed are removed from a stopped zone, and the stop signal is reset, the RollerDrive starts, and, after Timer 4 expires, the conveying process is continued. If the goods to be conveyed are placed in the zone sensor before Timer 4 expires, the conveying process starts immediately.

If goods to be conveyed block the zone sensor, the RollerDrive stops after expiration of Timer 2. After a pause, which is equivalent to Timer 2, the RollerDrive restarts. This process repeats itself until the goods to be conveyed have been removed from the zone sensor. As long as the zone sensor is blocked, the upstream zone is stopped.

After leaving the zone sensor, goods to be conveyed must reach the next zone sensor within the time for Timer 2. If Timer 2 is stopped, the upstream zone stops. After expiration of the Timer 2 time, the zone is interpreted as free, and the upstream zone can take in goods. It is assumed that the goods to be conveyed have been removed.

After goods to be conveyed have left the zone sensor, the RollerDrive continues to run as set for Timer 3.

Train release

For Train release, the following programs are available:

| Number of zones | Control program | Assigned sensors and motors |
|-----------------|-----------------------------|--|
| 1 | 1fachStauplatz_TrainRelease | S1 (for M1, M2, M3, M4) |
| 2 | 2fachStauplatz_TrainRelease | S1 (for M1 + M3), S2 (for M2 + M4) |
| 3 | 3fachStauplatz_TrainRelease | S1 (for M1), S2 (for M2), S3 (for M3) |
| 4 | 4fachStauplatz_TrainRelease | S1 (for M1), S2 (for M2), S3 (for M3), S4 (for M4) |

Free RollerDrive connections can be used as slave motors, as shown in the table.

The parameter Timer 1 influences the time-delayed starting of the RollerDrive in Train release.



I/O device

In the “I/O Device” program, it is possible to control the motors and the inputs/outputs using a program created in the master control system.

Assignment of the input and output signals

The assignment of zone sensors 1 to 4 is preset. Additional inputs/outputs can be configured. The speed settings of the motors are made using positive or negative percentage reference settings in the corresponding output bytes. In the master controller, the “Move” command is used for this purpose.

Configuration in the web browser

Control Program Selection

Control Program Selection

Program ID : 3fachStauplatz_Zone_Stop

Version : 2015-02-17-09

Control Timer

Timer #1 (0-30000 ms) : 2000

Timer #2 (0-30000 ms) : 4000

Timer #3 (0-30000 ms) : 5000

Timer #4 (0-30000 ms) : 1000

| ZPA Single release Program ID | ZPA Train release Program ID | No ZPA Program ID |
|----------------------------------|---------------------------------|----------------------|
| 1fachStauplatz_Zone_Stop | 1fachStauplatz_TrainRelease | I/O device |
| 2fachStauplatz_Zone_Stop | 2fachStauplatz_TrainRelease | |
| 3fachStauplatz_Zone_Stop | 3fachStauplatz_TrainRelease | |
| 4fachStauplatz_Zone_Stop | 4fachStauplatz_TrainRelease | |

Additional functions can be used only in connection with Interroll 24V conveyor modules of the Interroll automation system. (See additional user manual for the additional functions.)

Control timer

- Timer #1: Single release: not used
Train release: time-delayed starting of the RollerDrive
- Timer #2: Accumulation monitoring
- Timer #3: After-run of RollerDrive
- Timer #4: Fault reset



The timer parameters apply for all zones. The default parameters must be adapted to the specific conveying system.

In the “I/O Device” program, the timers have no effect.

Note:

Altered parameters must be transferred to the MultiControl by hitting the “Submit” button.

Motor settings

| Motor 1 | | Motor 3 | |
|---|------|---|------|
| <input checked="" type="checkbox"/> Enable | | <input checked="" type="checkbox"/> Enable | |
| Roller diameter (30.0-99.9 mm) : | 50.0 | Roller diameter (30.0-99.9 mm) : | 50.0 |
| Gearing ratio (1-99) : | 16 | Gearing ratio (1-99) : | 16 |
| Direction : <input checked="" type="radio"/> clockwise <input type="radio"/> counterclockwise | | Direction : <input checked="" type="radio"/> clockwise <input type="radio"/> counterclockwise | |
| Normal speed (0.1-1.99 m/s) : | 0.97 | Normal speed (0.1-1.99 m/s) : | 0.97 |
| Alternate speed (0.1-1.99 m/s) : | 0.50 | Alternate speed (0.1-1.99 m/s) : | 0.50 |
| Acceleration (0.0-9.99 m/s²) : | 0.00 | Acceleration (0.0-9.99 m/s²) : | 0.00 |
| Deceleration (0.0-9.99 m/s²) : | 0.00 | Deceleration (0.0-9.99 m/s²) : | 0.00 |

| Motor 2 | | Motor 4 | |
|---|------|---|------|
| <input checked="" type="checkbox"/> Enable | | <input checked="" type="checkbox"/> Enable | |
| Roller diameter (30.0-99.9 mm) : | 50.0 | Roller diameter (30.0-99.9 mm) : | 50.0 |
| Gearing ratio (1-99) : | 16 | Gearing ratio (1-99) : | 16 |
| Direction : <input checked="" type="radio"/> clockwise <input type="radio"/> counterclockwise | | Direction : <input checked="" type="radio"/> clockwise <input type="radio"/> counterclockwise | |
| Normal speed (0.1-1.99 m/s) : | 0.97 | Normal speed (0.1-1.99 m/s) : | 0.97 |
| Alternate speed (0.1-1.99 m/s) : | 0.50 | Alternate speed (0.1-1.99 m/s) : | 0.50 |
| Acceleration (0.0-9.99 m/s²) : | 0.00 | Acceleration (0.0-9.99 m/s²) : | 0.00 |
| Deceleration (0.0-9.99 m/s²) : | 0.00 | Deceleration (0.0-9.99 m/s²) : | 0.00 |

Motors not used must be deactivated, in order to avoid error messages.

“Roller diameter”, “gearing ratio”, and “normal speed” must be set in accordance with the RollerDrive used.

The parameter “direction” is used to adjust the direction of rotation of the RollerDrive for the installation position (direction of rotation, viewed from end of the cable of the RollerDrive).

“Acceleration” and “deceleration” change the start/stop behavior of the RollerDrive.

The parameter “alternate speed” currently has no function.

In the I/O Device program, the speed setting in percent is based on the value set here under “normal speed”.

Note:

Altered parameters must be transferred to the MultiControl by hitting the “Submit” button.



Digital I/O settings

| | |
|---|---|
| <div>Sensor 1</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> | <div>Sensor 3</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> |
| <div>I/O 1</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> <div>Function : <input type="text" value="PLC Input"/></div> | <div>I/O 3</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> <div>Function : <input type="text" value="PLC Input"/></div> |
| <div>Sensor 2</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> | <div>Sensor 4</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> |
| <div>I/O 2</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> <div>Function : <input type="text" value="PLC Input"/></div> | <div>I/O 4</div> <div>Type : <input checked="" type="radio"/> PNP <input type="radio"/> NPN</div> <div>Polarity : <input checked="" type="radio"/> positive <input type="radio"/> negative</div> <div>Function : <input type="text" value="PLC Input"/></div> |

☒ I/O State LEDs enabled

Sensors 1 to 4 are always assigned to the zone sensors. I/O 1 to I/O 4 can be configured.

I/O functions 1 to 4:

| Function | Description |
|------------------|-------------------------------|
| PLC input | Input signal from PLC |
| PLC output | Output signal to PLC |
| Sensor 5 | Start sensor for Zone 1 |
| Control input 1 | Stops Zone 1 |
| Control input 2 | Stops Zone 2 |
| Control input 3 | Stops Zone 3 |
| Control input 4 | Stops Zone 4 |
| Control output 1 | Output signal, Zone 1 blocked |
| Control output 2 | Output signal, Zone 2 blocked |
| Control output 3 | Output signal, Zone 3 blocked |
| Control output 4 | Output signal, Zone 4 blocked |

These functions have no effect on the I/O Device control program.

Additional functions can be used only in connection with Interroll 24V conveyor modules of the Interroll automation system. (See additional user manual for the additional functions.)

Note:

Altered parameters must be transferred to the MultiControl by hitting the “Submit” button.



Example: Start sensor

Sensor 1
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 1
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

Sensor 2
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 2
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

Sensor 3
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 3
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

Sensor 4
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 4
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

I/O 1 function = sensor 5

The sensor connected to I/O 1 is configured as the start sensor.

Example: Stopping Zone 3

Sensor 1
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 1
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

Sensor 2
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 2
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

Sensor 3
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 3
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

Sensor 4
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative

I/O 4
 Type : ☒ PNP ☐ NPN
 Polarity : ☒ positive ☐ negative
 Function :

I/O 2 function = control input 3

The third zone is stopped with a signal to I/O 2.

I/O 4 function = control output 3

The status (zone sensor blocked) of the third zone is output at I/O 4.



Digital I/O states

| | |
|-------------------------|-------------------------|
| Sensor 1 State : Off | Sensor 3 State : Off |
| I/O 1 State : Off | I/O 3 State : Off |
| Sensor 2 State : Off | Sensor 4 State : Off |
| I/O 2 State : Off | I/O 4 State : Off |

Display of the switching states of the connected sensors and I/O. Status changes become visible only after refreshing the web browser (key F5).

Error settings

| System Errors | | Control Errors | |
|-----------------------|-------------|-------------------|----------|
| Network Error | : Warning ▼ | Control Error 1 : | Ignore ▼ |
| Over Voltage Error | : Warning ▼ | Control Error 2 : | Ignore ▼ |
| Under Voltage Error | : Warning ▼ | Control Error 3 : | Ignore ▼ |
| Motor Error | : Warning ▼ | Control Error 4 : | Ignore ▼ |
| General Control Error | : Ignore ▼ | Control Error 5 : | Ignore ▼ |
| | | Control Error 6 : | Ignore ▼ |
| | | Control Error 7 : | Ignore ▼ |
| | | Control Error 8 : | Ignore ▼ |

Network error

Monitoring the communication between MultiControl and PLC.

| | |
|----------------|---|
| Ignore | Error is not displayed |
| Warning | Error is displayed by a 2x-blinking error LED; the conveying process is not interrupted |
| Immediate stop | Conveying process is interrupted; error is displayed by a 2x-blinking error LED |

The default setting is warning.

If the MultiControl is operated without PLC, the ignore setting is recommended.

If the MultiControl is operated with PLC, the immediate stop setting is recommended.

Motor error

Monitoring the motors.

| | |
|----------------|--|
| Immediate stop | Error is displayed by a 3x-blinking error LED. Other motors connected to the MultiControl stop. There is no infeed stop for the upstream MultiControl. |
|----------------|--|



Warning Error is displayed by a 3x-blinking error LED.
Other motors connected to the MultiControl turn.
Once the error is no longer present, the LED goes out.

The control settings for errors 1–8 have no function.
“Immediate Stop” and “Normal Stop” behave in the same way.

Up/download

Download
Bus Config : [download](#)
Application Config : [download](#)

Upload
Bus Config : [upload](#)
Application Config : [upload](#)
Software-Update : [upload](#)

The download function can be used to download configuration data from a MultiControl and store it on the PC.

The upload function makes it possible to read data into a MultiControl.
“Bus config” saves the data of the network settings. “Application config” saves the program data.

Saving the data

Place the mouse cursor on the “Download” button and open the menu with a right mouse click. Select the save location using “Save target as”.

Uploading the data

Click on the “Upload” button. Select the save file in the target directory. Clicking on the “Upload” button transfers the data to the MultiControl.

Teach-in process

The teach-in process provides for automatic addressing of multiple MultiControls. Furthermore, it provides the option of transferring configurations from one MultiControl to others.

In this process, the following settings are transferred or specified:

- The number of motors connected to each MultiControl
- The number of zones for each MultiControl
- The sensor configuration (type PNP/NPN and switching logic normally open/closed)
- Assignment of a network address to each MultiControl
- Assignment of a name for each MultiControl
- The neighbour relationships of the MultiControl
- Direction of rotation of the motors for the desired transport direction



Prerequisites

All MultiControls are in the delivery state.

The sensors matches the default setting of the MultiControl “PNP normally closed”.

(See “Configuring the sensors”.)

No goods are on the conveyor.

The process goes through multiple steps:

Step 1: Reading in the motor configuration

Step 2: Assigning the “slave RollerDrive”

Step 3: Ending the “teach-in” process

Basic setting of the MultiControl

The name and IP address of the first MultiControl can be changed before the teach-in process. The names and IP addresses of the additional connected MultiControls are increased by 1 during the teach-in process.

Reading in the motors

To start the “teach-in” process, the magnetic sensor must be actuated. When the magnetic sensor detects the magnet, the “Fault” LED lights up continuously.

After one second, running lights start on the LED bar on the left side of MultiControl.

As soon as LED “RD2” lights up, remove the magnet and wait until the running lights start in the right LED bar. Re-actuate the magnetic sensor. When LED “I/O3” lights up, remove the magnet.

The RollerDrives connected to the first MultiControl turn; with a slight delay, all the RollerDrives of the conveyor system also begin to turn.

Assigning the slave RollerDrive

With the magnet, again select the LED “RD2” on the left side, remove the magnet, and wait until the running lights start in the right LED bar. Re-actuate the magnetic sensor. When LED “RD4” lights up, remove the magnet.

If RollerDrives are connected to a MultiControl, but no corresponding zone sensors, they are detected as slave RollerDrives. The slave RollerDrives of a zone turn in a pulsing fashion. The slave RollerDrives are assigned by activating the corresponding zone sensor.

| Program | Assigned sensors and motors |
|-----------------|--|
| 4fach-Stauplatz | S1 (for M1), S2 (for M2), S3 (for M3), S4 (for M4) |
| 3fach-Stauplatz | S1 (for M1), S2 (for M2), S3 (for M3) |
| 2fach-Stauplatz | S1 (for M1 + M3), S2 (for M2 + M4) |
| 1fach-Stauplatz | S1 (for M1+M2+M3+M4) |



After all the slave RollerDrives have been assigned, the RollerDrive of the first zone begins to turn in an alternating fashion.

As soon as the RollerDrive begins to turn in the conveying direction, place an item into the zone sensor of the first zone. The teach-in process now runs automatically. If the direction of rotation of a RollerDrive does not match the conveying direction, it is changed. (Item shuttles.) Due to the necessary data transfer, there are pauses in the transitions from one MultiControl to the next.

After the item has reached the last zone sensor, the “teach-in” process can be concluded. To do so, actuate the magnetic sensor. When the magnetic sensor detects the magnet, the “Fault” LED lights up continuously.

After one second, running lights start on the LED bar on the left side of MultiControl.

As soon as LED “RD2” lights up, remove the magnet and wait until the running lights start in the right LED bar. Re-actuate the magnetic sensor. When LED “I/O4” lights up, remove the magnet.

Aborting the teach-in process

In order to abort the teach-in process, the magnetic sensor must be actuated. When the magnetic sensor detects the magnet, the “Fault” LED lights up continuously.

After one second, running lights start on the LED bar on the left side of MultiControl.

As soon as LED “RD2” lights up, remove the magnet and wait until the running lights start in the right LED bar. Re-actuate the magnetic sensor. When LED “Sensor 3” lights up, remove the magnet. All MultiControls must be set to the factory settings before the teach-in process is started.

Configuring the sensors

If the sensors do not match the factory settings of the MultiControl, it is possible to change them using the magnet.

To do so, actuate the magnetic sensor. When the magnetic sensor detects the magnet, the “Fault” LED lights up continuously.

After one second, running lights start on the LED bar on the left side of MultiControl.

As soon as LED “I/O1” lights up, remove the magnet and wait until the running lights start in the right LED bar. Re-actuate the magnetic sensor.

When LED of the desired sensor type lights up, remove the magnet.

| Sensor type | LED MultiControl |
|---------------------|------------------|
| PNP normally closed | Sensor 3 |
| NPN normally closed | I/O3 |
| PNP normally open | RD3 |
| NPN normally open | RD4 |

Appendix

Illustration from the cyclical process image

Inputs (observing and analyzing)

Process image "Universal Full"

| Byte | Bit | Category | Description | Type | Comment |
|------|-----|---|-------------|---------|--------------|
| 0 | .0 | Sensors | Sensor 1 | BOOLEAN | |
| 0 | .1 | Sensors | Sensor 2 | BOOLEAN | |
| 0 | .2 | Sensors | Sensor 3 | BOOLEAN | |
| 0 | .3 | Sensors | Sensor 4 | BOOLEAN | |
| 0 | .4 | Sensors | Sensor 5 | BOOLEAN | Start sensor |
| 0 | .5 | Sensors | Sensor 6 | BOOLEAN | |
| 0 | .6 | Sensors | Sensor 7 | BOOLEAN | |
| 0 | .7 | Sensors | Sensor 8 | BOOLEAN | |
| 1 | .0 | Digital I/Os PLC input PLC output Handshakes: In Up In Out Out Up Out Down | I/O 1 | BOOLEAN | |
| 1 | .1 | Digital I/Os PLC input PLC output Handshakes: In Up In Out Out Up Out Down | I/O 2 | BOOLEAN | |



| | | | | |
|------|---|---------------|---------|---|
| 1 .2 | Digital I/Os PLC input PLC output Handshakes: In Up In Out Out Up Out Down | I/O 3 | BOOLEAN | |
| 1 .3 | Digital I/Os PLC input PLC output Handshakes: In Up In Out Out Up Out Down | I/O 4 | BOOLEAN | |
| 2 .0 | MotorStates RD1 | Error1 | BOOLEAN | High = motor error, low = motor OK |
| 2 .1 | MotorStates RD2 | Error2 | BOOLEAN | |
| 2 .2 | MotorStates RD3 | Error3 | BOOLEAN | |
| 2 .3 | MotorStates RD4 | Error4 | BOOLEAN | |
| 3 | MotorStates RD1 | Speed1 | SINT | Speed 0–100 (0 = stop, 100 = max speed), Negative sign reverses the direction |
| 4 | MotorStates RD2 | Speed2 | SINT | |
| 5 | MotorStates RD3 | Speed3 | SINT | |
| 6 | MotorStates RD4 | Speed4 | SINT | |
| 8 | MotorStates RD1 | Motorcurrent1 | INT | Average current in mA |
| 10 | MotorStates RD2 | Motorcurrent2 | INT | |
| 12 | MotorStates RD3 | Motorcurrent3 | INT | |
| 14 | MotorStates RD4 | Motorcurrent4 | INT | |

| | | | | |
|-------|------------------|-----------------|---------|--|
| 16 | SystemState | Voltage_Motor | INT | Voltage "Motor Power" in mV |
| 18 | SystemState | Voltage_Logic | INT | Voltage "Power Logic + Sensors" in mV |
| 20 | SystemState | Temperature | INT | Temperature in 0.1°C |
| 22 | SystemState | SystemUpTime | DINT | Operating time in seconds since the last start/restart |
| 26 .0 | ControllInputs | ControllInput 1 | BOOLEAN | Stop Zone 1 |
| 26 .1 | ControllInputs | ControllInput 2 | BOOLEAN | Stop Zone 2 |
| 26 .2 | ControllInputs | ControllInput 3 | BOOLEAN | Stop Zone 3 |
| 26 .3 | ControllInputs | ControllInput 4 | BOOLEAN | Stop Zone 4 |
| 28 .0 | ControlOutputs | ControlOutput1 | BOOLEAN | Zone 1 blocked = 1 |
| 28 .1 | ControlOutputs | ControlOutput2 | BOOLEAN | Zone 2 blocked = 1 |
| 28 .2 | ControlOutputs | ControlOutput3 | BOOLEAN | Zone 3 blocked = 1 |
| 28 .3 | ControlOutputs | ControlOutput4 | BOOLEAN | Zone 4 blocked = 1 |
| 29 .0 | HandshakeSignals | In_Up | BOOLEAN | Start signal first zone |
| 29 .1 | HandshakeSignals | In_Down | BOOLEAN | Start signal end zone |
| 29 .4 | HandshakeSignals | Out_Up | BOOLEAN | High/low = zone free/busy |
| 29 .5 | HandshakeSignals | Out_Down | BOOLEAN | High/low = zone busy/free |
| 31 | ZoneStates | ZoneError1 | SINT | 0 = OK, ≠ 0 = zone error |
| 32 | ZoneStates | ZoneError2 | SINT | 0 = OK, ≠ 0 = zone error |
| 33 | ZoneStates | ZoneError3 | SINT | 0 = OK, ≠ 0 = zone error |
| 34 | ZoneStates | ZoneError4 | SINT | 0 = OK, ≠ 0 = zone error |



Outputs (control)

Process image "Universal Full"

| Byte | Bit | Category | Description | Type | Comment |
|------|-----|------------------------------|----------------|---------|--|
| 0 | .0 | Digital Outputs PLCOutput | Output1 | BOOLEAN | |
| | .1 | Digital Outputs PLCOutput | Output2 | BOOLEAN | |
| 0 | .2 | Digital Outputs PLCOutput | Output3 | BOOLEAN | |
| 0 | .3 | Digital Outputs PLCOutput | Output4 | BOOLEAN | |
| 1 | | Motor RD1 | Speed1 | SINT | Speed 0–100 (0 = stop, 100 = max speed), Negative sign reverses the direction |
| 2 | | Motor RD2 | Speed2 | SINT | Speed 0–100 (0 = stop, 100 = max speed), Negative sign reverses the direction |
| 3 | | Motor RD3 | Speed3 | SINT | Speed 0–100 (0 = stop, 100 = max speed), Negative sign reverses the direction |
| 4 | | Motor RD4 | Speed4 | SINT | Speed 0–100 (0 = stop, 100 = max speed), Negative sign reverses the direction |
| 5 | .0 | Control Inputs Overwrite | ControllInput1 | BOOLEAN | Stop Zone 1 |
| 5 | .1 | Control Inputs Overwrite | ControllInput2 | BOOLEAN | Stop Zone 2 |
| 5 | .2 | Control Inputs Overwrite | ControllInput3 | BOOLEAN | Stop Zone 3 |
| 5 | .3 | Control Inputs Overwrite | ControllInput4 | BOOLEAN | Stop Zone 4 |

| | | | | |
|------|--------------------------------|----------|---------|--------------------------|
| 8 .0 | Handshake Signals Overwrite | In Up | BOOLEAN | In_Up, start first zone |
| 8 .1 | Handshake Signals Overwrite | In Down | BOOLEAN | In_Down, start last zone |
| 8 .4 | Handshake Signals Overwrite | Out Up | BOOLEAN | Not used |
| 8 .5 | Handshake Signals Overwrite | Out Down | BOOLEAN | Not used |

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