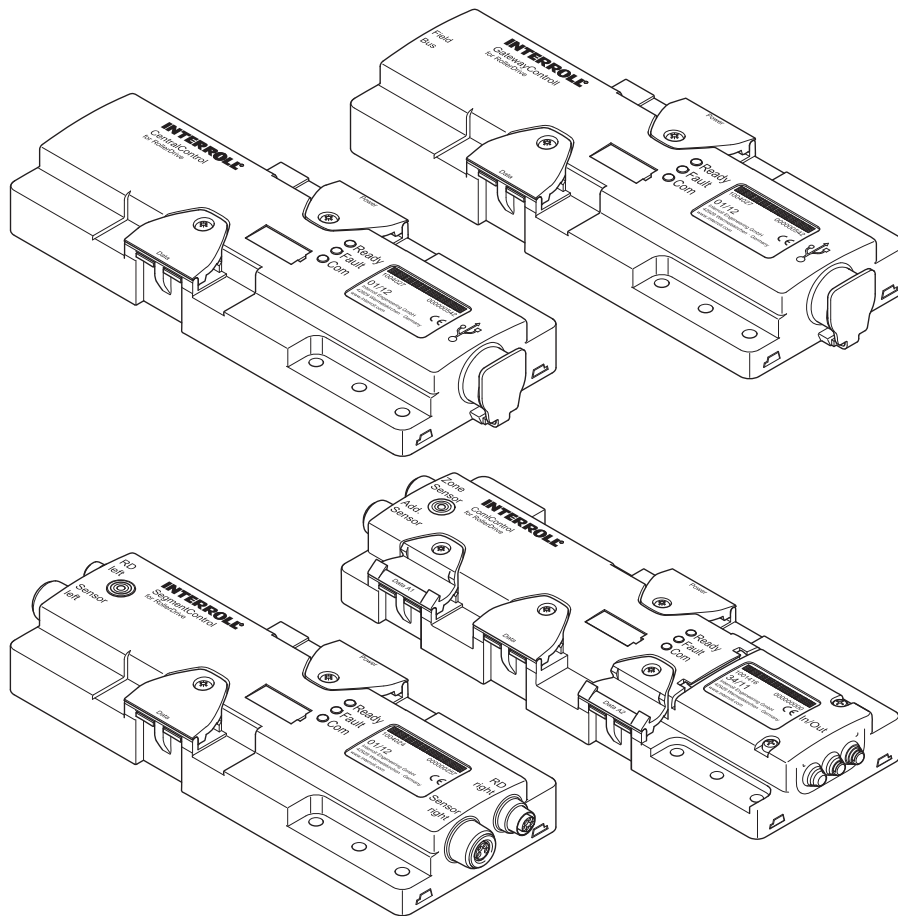


INSPIRED BY EFFICIENCY



# User Manual

## Interroll

### ConveyorControl system

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**Contents**

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## Table of contents

<b>Introduction.....</b>	<b>9</b>
Information about the manual.....	9
Contents.....	9
The manual is part of the product.....	9
Warning notices in this manual.....	9
Symbols.....	9
<b>Safety .....</b>	<b>10</b>
State of the art.....	10
Intended use .....	10
Personnel qualification .....	10
Operators .....	10
Service personnel.....	10
Electricians.....	10
Dangers.....	11
Bodily injury .....	11
Electricity.....	11
Working environment .....	11
Faults during operation .....	11
Maintenance.....	11
Accidental motor start .....	11
Interfaces to other devices.....	12
Operating modes .....	12
Normal mode.....	12
Special mode.....	12
<b>Product information .....</b>	<b>13</b>
Product description .....	13
CentralControl .....	13
GatewayControl.....	13
SegmentControl.....	14
ComControl .....	14
Configurator .....	14
Accessories.....	14
Description of functions.....	15
Zero pressure accumulation conveying.....	15
Initialization.....	16
Energy recovery/overvoltage protection .....	16
Temperature protection.....	16
Interfaces to other systems .....	17
Time-outs .....	17
Time-out when exiting the zone sensor (TimeOut1) .....	17
Time-out when reaching the zone sensor (TimeOut2) .....	17
Run-on time of RollerDrive (run-on).....	17
Removes a material from the detection area of the zone sensor (PermissionDelay).....	18
Structure .....	19



# Interroll ConveyorControl

## Table of contents

CentralControl .....	19
GatewayControl.....	19
SegmentControl.....	20
ComControl .....	20
Scope of delivery .....	21
CentralControl .....	21
GatewayControl.....	21
SegmentControl.....	21
ComControl .....	21
Label.....	21
Technical data .....	22
Profibus .....	22
Profinet .....	23
I&M (Identification and Maintenance) for Profibus/Profinet.....	24
Diagnostics and alarms for Profibus/Profinet .....	24
Ethernet.....	24
Dimensions.....	25
CentralControl .....	25
GatewayControl.....	25
SegmentControl.....	26
ComControl .....	26
<b>Transport and storage .....</b>	<b>27</b>
Ambient conditions for transport and storage.....	27
Transport.....	27
Storage .....	27
<b>Planning .....</b>	<b>28</b>
General information .....	28
Install software .....	28
Basic information .....	28
Operating instructions .....	29
Definition of terms.....	29
Starting the Configurator.....	30
Creating a new project .....	31
Loading the last project.....	31
Loading an existing project .....	31
Import .....	31
Cancel .....	31
User interface .....	32
Menu bar.....	33
USB connection status.....	34
Functional concept .....	34
Construct .....	34
Prepare to address.....	34
Address .....	34
Parameterize.....	34
Download.....	34

# Interroll ConveyorControl

## Table of contents

Constructing the conveyor line .....	35
Positioning zones.....	35
Changing the zone designation .....	36
Allocating modules.....	37
Assigning CentralControl or GatewayControl to the conveyor system.....	37
Report function.....	38
Prepare to address .....	38
Parameterizing modules .....	40
Limiting the parameters.....	41
Setting parameters .....	42
Overview of parameters.....	43
Zone .....	43
RollerDrive, slave RollerDrive .....	45
Sensor.....	45
Modules .....	46
In 1, In 2, and In 3.....	46
Out 1, Out 2, and Relay .....	48
CentralControl .....	48
Profibus GatewayControl .....	48
Profinet GatewayControl.....	49
EtherNet/IP GatewayControl .....	49
<b>Assembly and installation .....</b>	<b>51</b>
Warning notices for installation.....	51
Installation of the ConveyorControl modules .....	51
Initial installation.....	51
Re-installation .....	51
Warning notices for electrical installation .....	52
Electrical installation .....	53
Laying the flat cables .....	53
Changing the installation side.....	54
Overview of connections .....	55
Power supply and bus communication .....	56
RollerDrive.....	57
Sensors.....	57
ComControl inputs and outputs.....	58
USB port .....	60
GatewayControl Profibus connection .....	60
GatewayControl Profinet connection.....	61
GatewayControl EtherNet/IP connection .....	61
Ensuring protection rating IP54.....	62
Connection example for ConveyorControl system.....	63
<b>Initial startup and operation.....</b>	<b>65</b>
Initial startup .....	65
Checks before initial startup .....	65
Checks before each startup .....	65
Addressing modules.....	65



# Interroll ConveyorControl

## Table of contents

Addressing a replacement module .....	68
Downloading parameters .....	69
Self-test.....	70
'Ready' LED for SegmentControl without address.....	71
Operation.....	71
Start .....	72
Stop.....	72
<b>Maintenance and cleaning.....</b>	<b>73</b>
Warning notices about maintenance and cleaning .....	73
Maintenance .....	73
Checking the ConveyorControl.....	73
Replacing ConveyorControl modules .....	73
Cleaning.....	74
<b>Troubleshooting.....</b>	<b>75</b>
Meaning of the LEDs .....	75
GatewayControl and CentralControl .....	75
Error signaling for GatewayControl and CentralControl.....	76
SegmentControl and ComControl .....	76
Error signaling for SegmentControl and ComControl.....	77
LED display when using the addressing magnet .....	78
Behavior in case of an error .....	79
Troubleshooting.....	81
<b>Decommissioning and disposal .....</b>	<b>83</b>
Decommissioning .....	83
Disposal.....	83
<b>Appendix .....</b>	<b>84</b>
Accessories .....	84
Possible wiring of the inputs.....	85
Not used .....	85
Zone sensor/'In1' .....	85
Start sensor/'In2' .....	85
Start D one zone .....	86
Start Z one zone .....	86
Single release .....	87
Train release .....	89
Stop D one zone .....	91
Stop D all zones .....	91
Stop Z one zone.....	91
Stop Z all zones.....	91
Clear.....	92
Clear reverse.....	92
Alternative speed.....	92
Conveyor direction .....	92
System restart .....	93
Prioritizing of signals.....	93

# Interroll ConveyorControl

## Table of contents

Possible wiring of the ComControl outputs .....	94
Not used .....	94
Error signal.....	94
Aux RD start.....	94
ZoneStatus .....	94
Sensor signal .....	96
Input signal 2, input signal 3.....	96
Glossary of parameters.....	97
PB1 .....	97
PB2 .....	97
PB3 .....	97
PB4 .....	97
PB5 .....	97
PB6 .....	97
PB7 .....	97
PB8 .....	97
PB10 .....	97
PB11 .....	97
PB12.....	98
PB13.....	98
PB14.....	98
PD1.....	98
PD2.....	98
PD3.....	98
PD4.....	98
PD5.....	98
PD6.....	99
PD7.....	99
PG1 .....	99
PIN1 .....	100
PIN2 .....	100
PIN3 .....	100
PIN4 .....	100
POUT1.....	100
POUT2.....	100
POUT3.....	100
POUT4.....	100
PZ2 .....	101
PZ3 .....	101
PZ4 .....	101
PZ5 .....	101
PZ6 .....	101
PZ7 .....	102
PZ8 .....	102
PZ9 .....	102
PZ10 .....	102
PZ11 .....	102
PZ12 .....	103



## Interroll ConveyorControl

---

### Table of contents

PZ13 .....	103
PZ14 .....	103
PZ15 .....	103
PZ16 .....	103
PZ17 .....	104
PZ18 .....	104
PZ19 .....	104
PZ20 .....	104
PZ21 .....	105
Control Mode.....	105
MACAddress .....	105
NodeID.....	105
ProductKey.....	105
Serial.....	105
PLC process map – Cyclical data.....	106
Setting values/errors – Acyclical process data.....	110
Slot assignment for Profibus/Profinet .....	113
CIP objects for EtherNet/IP .....	114
Identity Object .....	114
Assembly Object .....	114
Connection Manager Object.....	115
Adapter Object .....	115
TCP/IP Interface Object .....	116
EtherNet Link Object.....	117
Electrical data of connections .....	119
Lock time with bouncing level .....	121
Declaration of Conformity .....	122



## Introduction

### Information about the manual

#### Contents

This instruction manual contains important notes and information about the various operating phases of the ConveyorControl system.

The instruction manual describes the product as it is delivered by Interroll.

In addition to this instruction manual, special contractual agreements and technical documents apply to special versions.

#### The manual is part of the product

- ▶ For trouble-free, safe operation and compliance with possible warranty claims, read the manual first and follow the instructions.
- ▶ Keep the manual close to the product.
- ▶ Pass the manual on to any subsequent operator or owner.
- ▶ **NOTICE! The manufacturer does not accept any liability for faults or defects due to non-observance of this instruction manual.**
- ▶ If you have any questions after reading the operating instructions, please contact the Interroll customer service. Contact persons close to you can be found on the Internet under [www.interroll.com/contact](http://www.interroll.com/contact).

### Warning notices in this manual

The warning notices refer to risks that may arise while using the product. They are available in four danger levels identified by the signal word:

Signal word	Meaning
DANGER	Identifies a danger with high risk that will result in death or serious injury if it is not avoided.
WARNING	Identifies a danger with medium risk that could result in death or serious injury if it is not avoided.
CAUTION	Identifies a danger with low risk that could result in minor or medium injury if it is not avoided.
NOTICE	Identifies a danger that results in property damage.

### Symbols



This symbol marks useful and important information.

Requirement:

- This symbol represents a prerequisite to be met prior to assembly and maintenance work.
- ▶ This symbol marks the steps to be carried out.

## Safety

### State of the art

The product has been built to comply with the state of the art and is reliable in operation as delivered. Nevertheless, hazards may arise during its use.



Disregarding the notices in this manual may lead to serious injury.

- ▶ Carefully read the manual and follow its content.

### Intended use

The ConveyorControl system may only be used for industrial applications and in an industrial environment to control the RollerDrive EC310.

The ConveyorControl system must be integrated into a conveyor module or conveyor system. Any other use is considered inappropriate.

Any modifications that affect the safety of the product are not permitted.

The product may only be operated within the defined operating limits.

Deviating applications require the approval of Interroll.

### Personnel qualification

Unqualified personnel cannot recognize risks and, as a result, is subject to greater dangers.

- ▶ Authorize only qualified personnel to perform the activities described in these instructions.
- ▶ The operating company must ensure that personnel follow locally applicable regulations and rules about safety and hazards while working.

The following target groups are addressed in these instructions:

#### **Operators**

Operators have been instructed in the operation and cleaning of the product, and follow the safety guidelines.

#### **Service personnel**

The service personnel features a technical training and performs the maintenance and repair tasks.

#### **Electricians**

Persons working on electrical installations must have the pertinent technical training. They require suitable training, suitable education and experience that enables them to detect risks and avoid dangers which could originate from the electricity. (IEC 60204-1)

## Interroll ConveyorControl

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### Safety

### Dangers



The following list informs you about the various types of danger or damage that may occur while operating the product.

#### **Bodily injury**

- ▶ Work on the device must be performed only by authorized electricians in accordance with applicable regulations.
- ▶ Before using the product, ensure that no unauthorized personnel is in the vicinity of the conveyor.

#### **Electricity**

- ▶ Only perform installation and maintenance work in the de-energized state.
- ▶ Secure the device against inadvertent activation.

#### **Working environment**

- ▶ Do not use the product in explosive environments.
- ▶ Remove material that is not required and unnecessary objects from the workspace.

#### **Faults during operation**

- ▶ Regularly check the product for visible damage.
- ▶ If you notice smoke, switch off the power immediately and ensure that it cannot be switched on again accidentally.
- ▶ Immediately contact an electrician and have that person determine the cause of the fault.

#### **Maintenance**

- ▶ Because the product does not require maintenance, you only need to inspect all components regularly for visible damage and check that all cables and screws are firmly in place.

#### **Accidental motor start**

- ▶ Ensure that a connected motor cannot start accidentally, particularly for assembly, maintenance work and troubleshooting.



## Interroll ConveyorControl

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### Safety

#### Interfaces to other devices

Hazard zones may occur while installing the product in a complete system. These zones are not part of this manual and have to be analyzed during the design, installation and startup of the complete system.

- ▶ After installing the product in a conveyor system, check the complete system for new potential hazard zones before switching on the conveyor.
- ▶ Additional construction measures may be required.

#### Operating modes

##### Normal mode

Operation of the installed device at the end customer's as a component in a conveyor in a complete system.

##### Special mode

Special operation refers to all operating modes which are required to guarantee and maintain regular operation.

Special operating mode	Explanation	Comment
Transport/storage	Loading and unloading, transport and storage	-
Assembly/Initial start-up	Installation at the end customer and performing the test run	-
Cleaning	External cleaning without removing protective devices	In the de-energized state
Maintenance/Repairs	Maintenance and inspection tasks	In the de-energized state
Troubleshooting	Troubleshooting in the event of a fault	-
Fault elimination	Eliminating the fault	In the de-energized state
Decommissioning	Removing from the complete system	In the de-energized state
Disposal	Removing from the complete system and disassembly	In the de-energized state

### Product information

#### Product description

The ConveyorControl system is a control system for conveyor systems that allows for setting many parameters, which makes it very flexible to use. It can work completely independently. Following successful addressing and parameterization, no external control computer or PLC is required.

The system can be connected to Profibus, Profinet or EtherNet/IP fieldbuses. With the help of the Configurator, a conveyor system with up to 100 ConveyorControl modules can be planned, addressed and parameterized. The maximum overall length of the bus communication can be 200 m.

The ConveyorControl system consists of the following components:

- CentralControl or GatewayControl
- SegmentControl
- ComControl
- Configurator
- Accessories:
  - Flat cable
  - Power supply
  - Addressing magnet
  - Terminating resistor
  - Cable bridge

#### CentralControl

The CentralControl monitors the correct connection and function of the individual ConveyorControl modules. It is connected to these modules via the bus communication and can thus recognize and assess various system error types. Errors that occurred are indicated by LEDs.

The CentralControl can be connected at any point of the bus line. Both ends of the bus line must be terminated by a ComControl with activated terminating resistor or by a terminating resistor. Each conveyor system can only have one CentralControl.

#### GatewayControl

The GatewayControl has the same function as a CentralControl. In addition, it can be connected to a higher-level control system (PLC) using the Profibus, Profinet or EtherNet/IP fieldbuses. It is implemented as an I/O adapter (slave) and supports implicit (cyclical) and explicit (acyclical) data exchange. The GatewayControl can be connected at any point of the bus line. Both ends of the bus line must be terminated by a ComControl with activated terminating resistor or by a terminating resistor.

A GatewayControl can be operated in two different **control system modes**:

- **I/O PLC control**: In this control system mode, SegmentControls and ComControls control the conveying process. The master PLC can monitor and influence the conveying process using the process map for individual zones or the entire conveyor system (start, stop, reversal of direction).

## Interroll ConveyorControl

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### Product information

- **Full PLC control:** In this control system mode, the master PLC controls the conveying process. The process map of the PLC shows the current states of the sensors and the RollerDrive, and individual RollerDrives can be switched on or off. In this control system mode, the ConveyorControl system does not offer a zero pressure accumulation control logic – that logic must be programmed via the PLC.

Mixing control modes is possible. To do so, the corresponding mode must be set in the SegmentControls and ComControls (PG 1).

### SegmentControl

The SegmentControl can control one or two zones in a conveyor system. For each zone, one sensor is analyzed and one RollerDrive is controlled. SegmentControl functionality is flexibly adjustable, e.g. the sensor logic, RollerDrive parameters, and conveyor logic parameters can be set.

Errors that occurred, e.g. at the RollerDrive, the sensors or in the conveyor logic, are indicated via LEDs or in the control registers. When an error occurs or after an error has been remedied, the SegmentControl performs a defined response that depends on the particular error and can be set.

If two drives per zone are required in a conveyor system, a second RollerDrive can be connected to the SegmentControl. It is called a "Slave RollerDrive" and receives the same commands as the first RollerDrive, if it is parameterized accordingly.

In order to function within the ConveyorControl system, a SegmentControl requires at least one CentralControl or GatewayControl and two terminating resistors.

### ComControl

The ComControl controls one zone. For each zone, one sensor is analyzed and one RollerDrive is controlled. In addition, two more inputs and three outputs can be connected. The ComControl functionality is flexibly adjustable.

The bus line can be branched off at the connections *Data A1* and *Data A2*. If the ComControl is installed at the end of the bus line, the internal terminating resistor can be switched on.

Errors that occurred, e.g. at the RollerDrive, the sensors or the conveyor logic, are indicated via LEDs or in the control registers. When an error occurs or after an error has been remedied, ComControl performs a defined response that depends on the particular error and can be set.

In order to function within the ConveyorControl system, a ComControl requires at least one CentralControl or GatewayControl and one terminating resistor.

### Configurator

The ConveyorControl Configurator software is used for addressing and parameterizing the individual modules in the ConveyorControl system. The conveyor system can be recreated virtually and configured according to requirements.

### Accessories

- In addition to the ConveyorControl modules, additional accessories are available from Interroll:
- Only the PowerControl power supply offered by Interroll may be used for the voltage supply of the modules.
  - Only the flat cable from Interroll may be used for the power supply and for bus communication.

## Interroll ConveyorControl

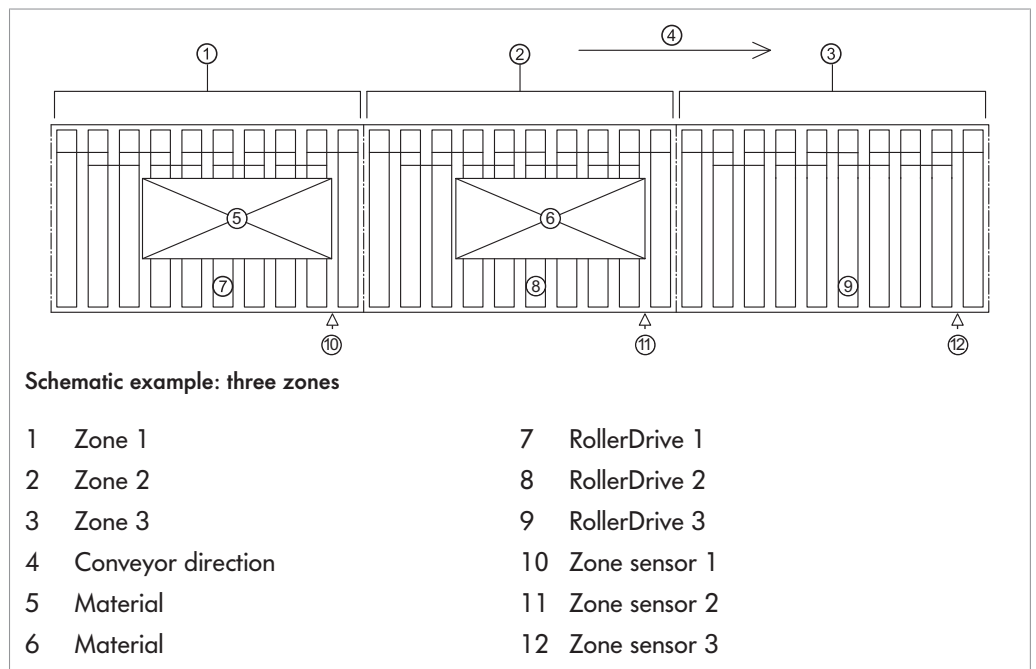
### Product information

### Description of functions

#### Zero pressure accumulation conveying

The ConveyorControl system enables zero pressure accumulation conveying. This means that material is transported without coming into contact with other material. For this purpose, the conveyor line is divided into zones. A zone consists of a RollerDrive, several idler rollers, a control module, and the corresponding sensors.

Zero pressure accumulation is possible because only one material is in each zone, and the zones keep the material until the corresponding zone sensor detects that the downstream zone is "unblocked". When accumulation of material occurs, a signal is transmitted to the upstream zone to keep the next material. A gap is always left between the materials so that no accumulation pressure occurs.



A material is conveyed until it either reaches the last zone on the conveyor line or the last unblocked zone before another material. In both cases, it is stopped in the corresponding zone.

In the example above, material 6 is automatically transported to zone 3. When the rear edge of material 6 leaves zone sensor 2, RollerDrive 1 is started immediately, and material 5 is transported to zone 2 (single release). As soon as material 5 leaves zone sensor 1, the run-on time starts (see "Run-on time of RollerDrive (run-on)", page 17).

When the conveyor is operated in train release mode, after a start signal for the front material all materials are simultaneously transported forward to the next zone. Using parameter PZ12, a delayed start of the individual zones can be set.

If one material each is located in all three zones and the material in zone 2 was removed manually, RollerDrive 2 turns immediately. If zone sensor 2 is not blocked again, the zone is defined as unblocked after a delay period expires. The delay period is defined by parameter PZ11 ("PermissionDelay") between 0 and 25 seconds. If the parameter is set to 0, the package would be transported directly from zone 1 to zone 2 once zone sensor 2 is unblocked.

## Interroll ConveyorControl

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### Product information

#### Initialization

Initialization serves to switch the conveyor line to a defined state. This is achieved as follows: In all zones where the zone sensor is unblocked, the RollerDrives turn until the front edge of a material is detected by the zone sensor. As soon as a material is detected, the RollerDrive in the corresponding zone stops. If no material is detected by a zone sensor during initialization, the corresponding zone is considered unblocked. In all zones where the zone sensor is blocked at the start of initialization, the RollerDrives are not started.

Initialization occurs in the following cases:

- following the successful downloading of parameters
- when the conveyor system is started (operating voltage is switched on)
- when an error is remedied or canceled
- after removal of control signals, such as *Clear* or *Stop D*
- by activating the function *System Restart*

The specified parameters are used during initialization. This means that, e.g. the RollerDrive turns at the specified speed or the sensor transmits the signals in the selected switching logic.

The initialization time can be set using the parameters (PZ14) global and PZ15 (local). If a parameter is set to 0 seconds, the corresponding initialization is switched off.

There are two different types of initialization:

- Global initialization: all zones in the conveyor system perform initialization at the same time
- Local initialization: only certain zones perform the initialization procedure (e.g. zones in which an error was remedied)



If all zones are empty during initialization, all RollerDrives must turn. If individual RollerDrives do not turn, even though the zone is unblocked, the sensors may have been set incorrectly (PNP/NPN or normally open/normally closed).

#### Energy recovery/ overvoltage protection

If the RollerDrive is stopped or the speed is abruptly reduced, the kinetic energy of the material is converted into electrical energy by the RollerDrive acting as a generator. This energy is fed back into the ConveyorControl system where it can be used by other RollerDrives.

If energy recovery is higher than energy demand, the excess energy is converted to heat by a brake chopper resistor in the ComControl or SegmentControl. The brake chopper resistor is activated when the voltage exceeds 26 V. This prevents excessively high voltages within the ConveyorControl system.

#### Temperature protection

If operating conditions cause the brake chopper to be switched on so often that the upper temperature limit of approx. 90 °C (measured internally) is reached, the SegmentControl/ComControl switches off. An active temperature protection is shown on the LED display or in the control register. When the SegmentControl/ComControl has cooled down, the RollerDrive restarts automatically when a start signal is pending. This temperature protection cannot be avoided with a voltage reset; even then you must wait until the temperature has fallen sufficiently.



## Interroll ConveyorControl

### Product information



### ⚠ CAUTION

#### Inadvertent startup of RollerDrive after cooling of SegmentControl/ComControl

Danger of crushing of limbs and property damage

- ▶ Ensure that no start signal is pending during the cooling-down process.

### Interfaces to other systems

With the help of inputs at the ComControl, signals of upstream systems can be used and processed further (see "Possible wiring of the inputs", page 85), e.g. an external signal can be analyzed as a start signal for the first zone.

In the same vein, signals of the last zone (e.g. the zone status) can be output via the ComControl outputs to provide them to downstream systems (see "Possible wiring of the ComControl outputs", page 94).

If a GatewayControl is used, the signals of the zones can be transmitted to a PLC via the fieldbus. This applies to SegmentControls and ComControls (see "PLC process map – Cyclical data", page 106).

### Time-outs

The following delays or time-outs can be used:

#### Time-out when exiting the zone sensor (TimeOut1)

This time-out allows for monitoring whether packages are jammed and thus can no longer be transported.

After starting the transport of a material, the blocked zone sensor must become unblocked after a specified time (can be set with parameter PZ6). If the sensor is still blocked after this time expires, TimeOut1 occurs. Parameter PZ7 can be used to set whether conveying is to be stopped in this case. If parameter PZ7 = *Ignore error*, the RollerDrive will turn until the sensor becomes unblocked and the subsequent switch-off delay period has expired.

The error can be reset by pushing the material manually into the detection area of the zone sensor in the downstream zone. After resetting, the downstream zone runs a local initialization. The error can also be reset by a Stop command and the local initialization resulting from it.

#### Time-out when reaching the zone sensor (TimeOut2)

This time-out allows for monitoring whether material has been removed manually, has fallen down or is blocked. As soon as a material has left the detection area of a zone sensor, the time required until it reaches the next zone sensor is measured. If this time exceeds a specified time (can be set with parameter PZ8), TimeOut2 occurs. Parameter PZ9 can be used to set whether conveying is to be stopped or continued in this case. If parameter PZ9 = *Ignore error*, the RollerDrive will turn until another material blocks the zone sensor.

The error can be reset by blocking the zone sensor in question. The error can also be reset by a Stop command and the local initialization resulting from it.

#### Run-on time of RollerDrive (run-on)

If a material leaves the sensor area of a zone, the RollerDrive of this zone continues to run for up to 25 seconds (can be set with parameter PZ10). After this time expires, the RollerDrive stops if no new material is transferred from the upstream zone.

This feature provides the following benefits:

- Avoids unnecessary start/stop operation if there are short gaps between the materials.



## Interroll ConveyorControl

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### Product information

- Energy is saved by switching off the RollerDrive when no additional material has to be transported.

**Removes a material from  
the detection area of the  
zone sensor  
(PermissionDelay)**

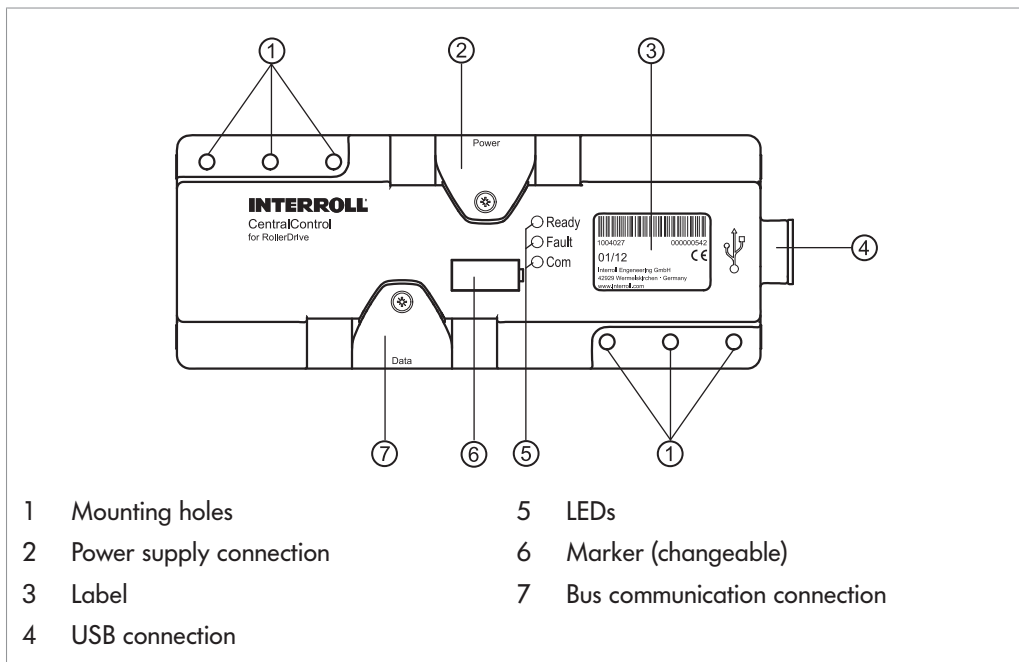
If the zone sensor becomes unblocked through manual intervention (resetting or removing an already stopped material), the RollerDrive of this zone continues to run for up to 25 seconds (can be set with parameter PZ11) to transport the material again into the detection area of the zone sensor. During this time a signal is not sent to the upstream zone stating that the zone is unblocked. This is to prevent another material from moving into the zone. If the sensor is not re-blocked during this time, an "unblocked" message is sent to the upstream zone.

# Interroll ConveyorControl

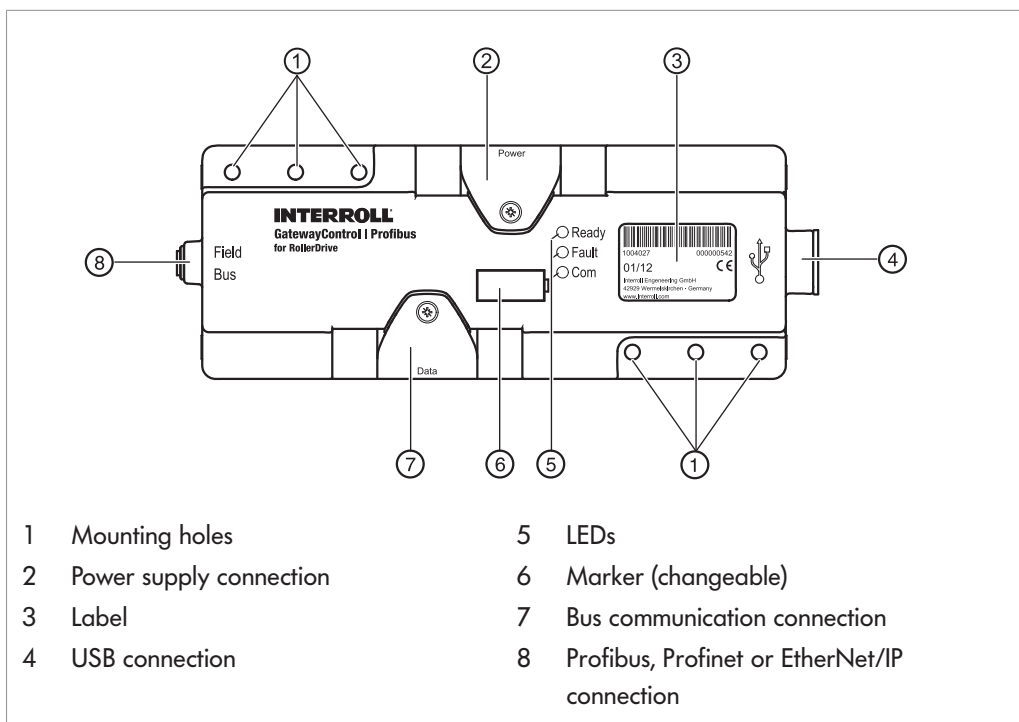
## Product information

### Structure

#### CentralControl



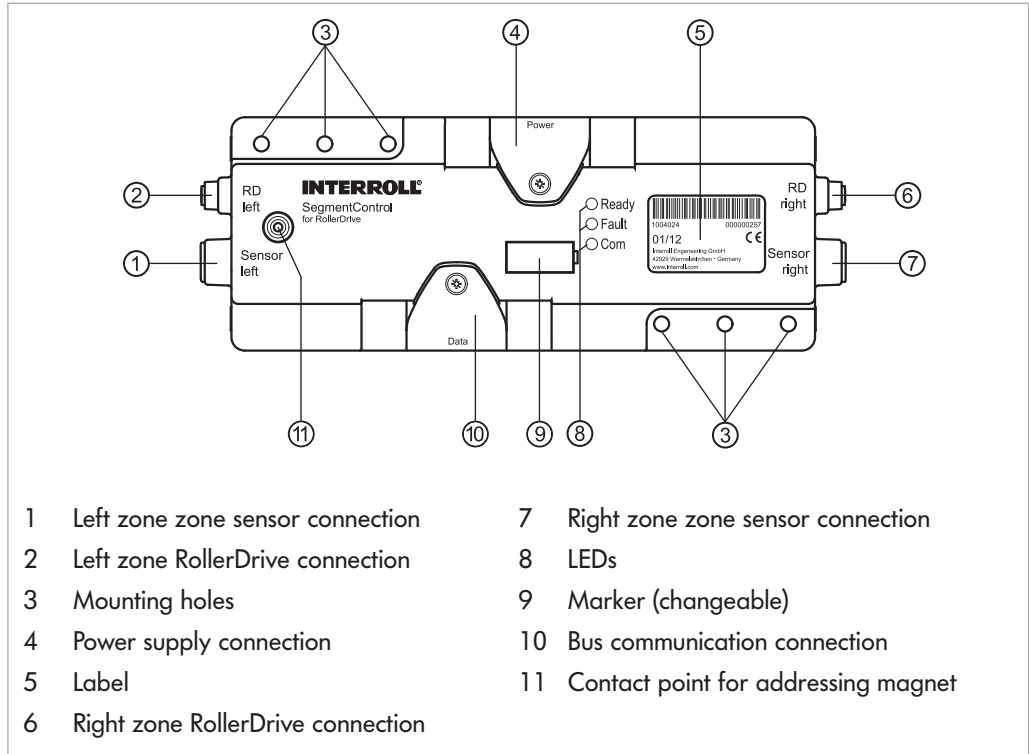
#### GatewayControl



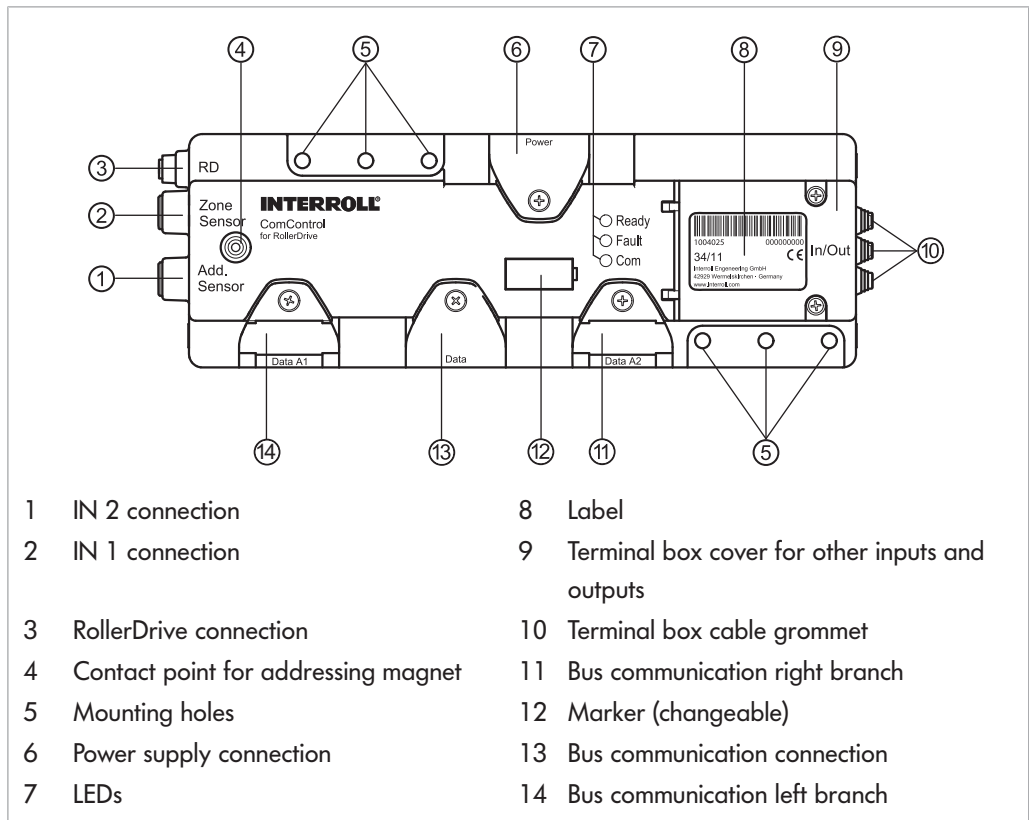
# Interroll ConveyorControl

## Product information

### SegmentControl



### ComControl



## Interroll ConveyorControl

### Product information

#### Scope of delivery

- CentralControl** The scope of delivery of the CentralControl contains the following components:
- CentralControl
  - 2 end caps to terminate the flat cable - left design
  - 2 end caps to terminate the flat cable - right design
  - USB stick with ConveyorControl Configurator software
  - Addressing magnet
  - Terminating resistor
- GatewayControl** The scope of delivery of the GatewayControl contains the following components:
- GatewayControl
  - 2 end caps to terminate the flat cable - left design
  - 2 end caps to terminate the flat cable - right design
  - USB stick with ConveyorControl Configurator software
  - Addressing magnet
  - Terminating resistor
- SegmentControl** The scope of delivery of the SegmentControl contains the following components:
- SegmentControl
  - M8 blind cap for a sensor connection
  - M8 blind cap for a RollerDrive connection
  - End cap to terminate the flat cable - left design
  - End cap to terminate the flat cable - right design
- ComControl** The scope of delivery of the ComControl contains the following components:
- ComControl
  - M8 blind cap for the input connection IN 1 or IN 2
  - 2 short flat cables with two sealed ends
  - 3 end caps to terminate the flat cable - left design
  - 3 end caps to terminate the flat cable - right design

### Label

The information on the label is used to identify the module.





## Interroll ConveyorControl

### Product information

### Technical data

Rated voltage	24 V DC Protected extra-low voltage PELV (IEC 60204-1)
Temporarily permissible voltage range	19 to 26 V DC
Protection rate	IP54
Weight	approx. 370 g
Ambient temperature in operation	-30 to +40 °C
Max. temperature change	1 K/min, 3 h, 2 cycles (IEC 60068-2-14)
Relative humidity	93 % at +40 °C 14 days, non-condensing (IEC 60068-2-78)
Max. installation height above sea level	1000 m The installation in systems at an altitude above 1000 m is possible in principle. However, this may result in a reduction of the performance values.
Mechanical stress	IEC 60068-2-27 15 g / 6 ms; 10 g / 11 ms EC 60068-2-6 2-500 Hz ±1.6 mm / 2 g IEC 60068-2-64 2-500 Hz ±1.6 mm / 2 g

The following data differ for the modules listed:

Current consumption	CentralControl/GatewayControl:	approx. 0.15 A
	SegmentControl/ComControl:	approx. 0.05 A + connected sensors and actuators
	Rated current per RollerDrive:	approx. 2 A
	Startup current per RollerDrive:	approx. 4 A

### Profibus

Transmission technology	RS 485 according to ANSI TIA/EIA 485-A
Bit rates	9.6 Kbit – 12 Mbit, automatic bit rate detection recommended
Protocol	Profibus DP with DPV1 expansion
Node class	DPV1 slave
Node configuration	Modular slave with 11 permanently assigned modules

## Interroll ConveyorControl

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### Product information

Transmission service	MSO for cyclical data: 202 bytes input data 202 bytes output data FAILSAFE function supported SYNC and FREEZE modes not supported
	MS1/MS2 for acyclical data I&M0 (65000): Device-specific basic information Read error status and conveying parameters Write conveying parameters Diagnostics alarms

### Profinet

Transmission technology	100BASE-TX, full duplex
Bit rate	100 Mbit/s
Protocol	Profinet IO, PN-RT_CLASS_1
Node class	I/O device
Node configuration	Modular slave with 11 permanently assigned modules
Transmission service	IO Data CRt for cyclical data: 202 bytes input data 202 bytes output data FAILSAFE function supported SYNC and FREEZE modes not supported
	Record Data CR for acyclical data: I&M0 (65000): Device-specific basic information Read error status and conveying parameters Write conveying parameters
	Alarm CR for acyclical alarm data: Diagnostics alarms



## Interroll ConveyorControl

---

### Product information

#### I&M (Identification and Maintenance) for Profibus/Profinet

The GatewayControl supports I&M data level 0. These data allow identifying the device via Profibus.

The following information is transmitted:

- Name of manufacturer
- Vendor ID
- Order ID
- Serial number of device
- Hardware and software version
- Product type (in the form of 2 profile IDs)

#### Diagnostics and alarms for Profibus/Profinet

The GatewayControl provides expanded diagnostics according to Profibus/Profinet standard.

The manufacturer-specific diagnostics data consist of 4 bytes with the following content:

- 2 bytes, global error register (ERR)
- 2 bytes, extended error register (ERR\_EXT)

The content of the ERR and ERR\_EXT registers is described in the appendix (see "*Setting values/errors – Acyclical process data*", page 110).

The slot assignment for the data modules is described in the appendix (see "*Slot assignment for Profibus/Profinet*", page 113).

### Ethernet

Transmission technology	100BASE-TX, full duplex
Bit rate	10/100 Mbit/s
Protocol	CIP
Node class	Communications adapter
Transmission service	Implicit Messages for cyclical data: 202 bytes input data 202 bytes output data Explicit Messages for acyclical data: Device-specific basic information Read error status and conveying parameters Write conveying parameters
Additional services	UCMM, ACD, BOOTP, DHCP

The data for EtherNet/IP is managed via communication objects (see "*CIP objects for EtherNet/IP*", page 114). The data format is specified as Little Endian, i.e. the lowest-value bytes of numeric values are transmitted first.

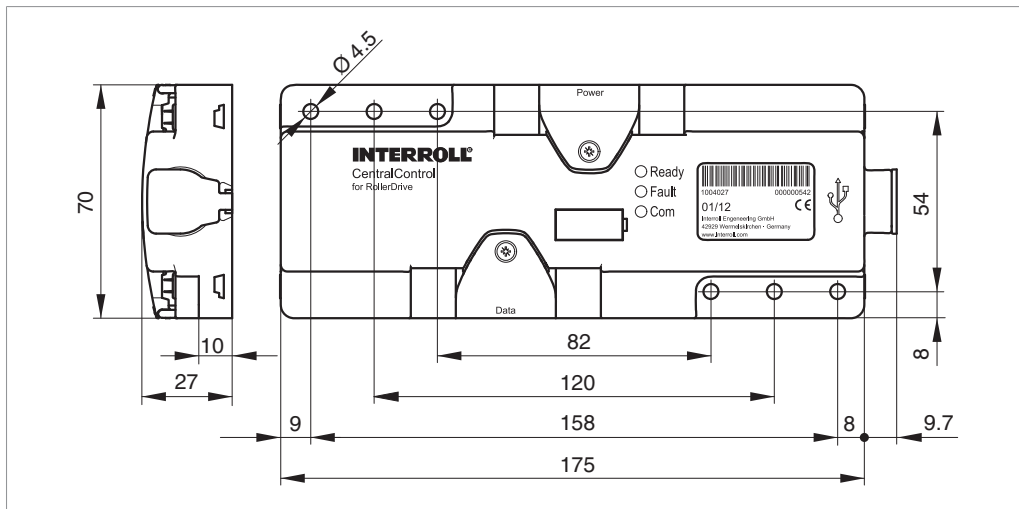


# Interroll ConveyorControl

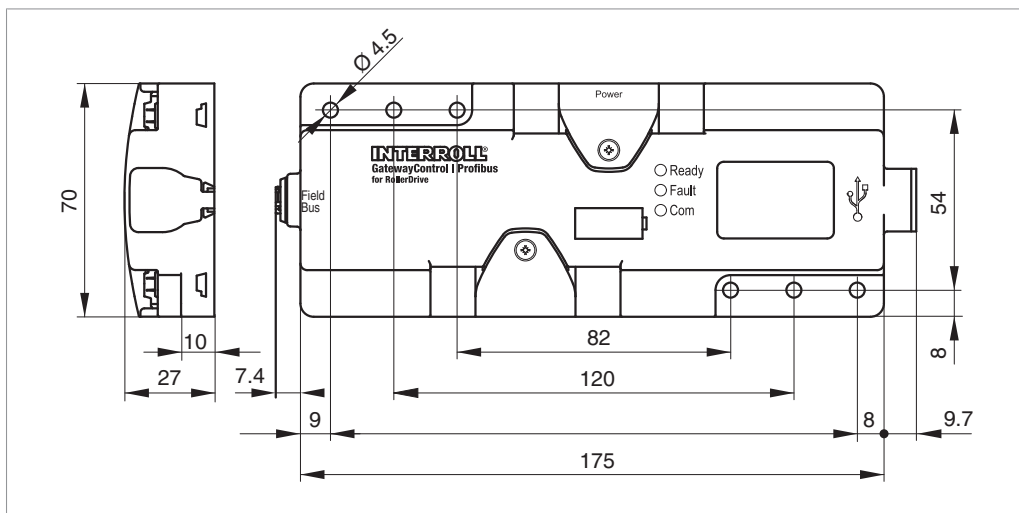
## Product information

## Dimensions

### CentralControl



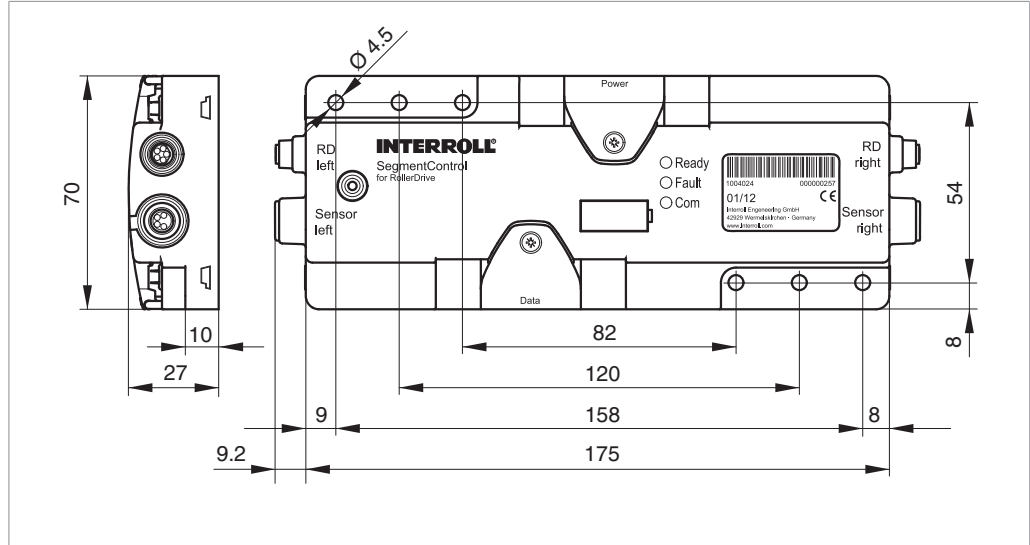
### GatewayControl



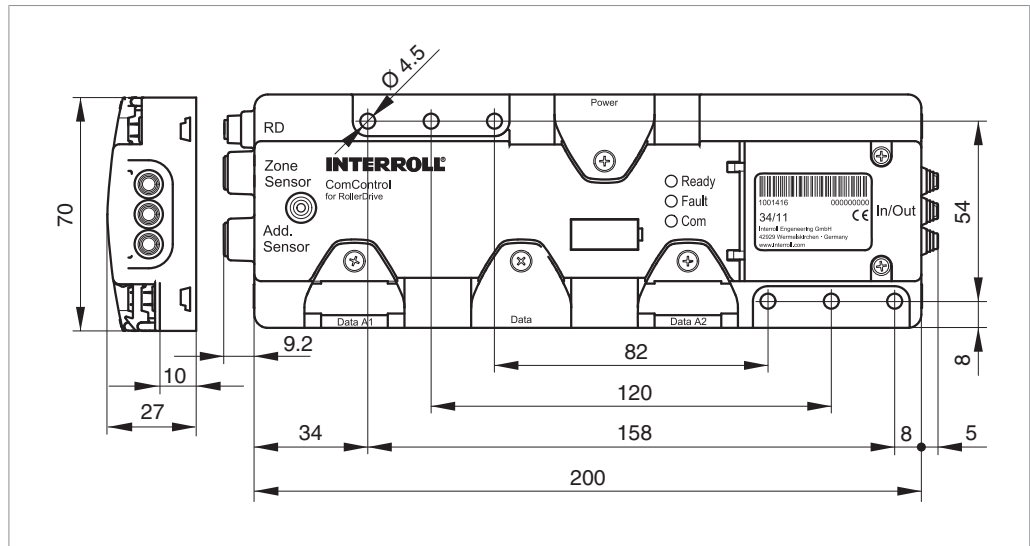
# Interroll ConveyorControl

## Product information

### SegmentControl



### ComControl



## Transport and storage

### Ambient conditions for transport and storage

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Permissible ambient temperature	-40 to +85 °C
Max. relative humidity	93 % at +40 °C 14 days, non-condensing (IEC 60068-2-78)
Max. temperature change	1 K/min, 3 h, 2 cycles (IEC 60068-2-14)

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### Transport

- Each module is packaged in its own cardboard box.
- 

### **NOTICE**

#### **There is a risk of damage to property if transported incorrectly**

- ▶ Transport-related tasks should only be carried out by qualified and authorized persons.
  - ▶ Observe the following notes.
- 
- ▶ Avoid heavy impacts during transport.
  - ▶ Inspect each module for visible damage after transport.
  - ▶ In the event of damage, take photos of the damaged parts.
  - ▶ Report any damage caused by transport immediately to the transport company and Interroll, to maintain warranty.
  - ▶ Do not expose the modules to large temperature fluctuations as this could result in condensation.

### Storage

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### **NOTICE**

#### **Risk of damage to property due to improper storage**

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- ▶ Inspect each module for damage after storage.

### Planning

The conveyor system can be virtually planned in advance using the ConveyorControl Configurator (called Configurator below). All module parameters can be set offline and then downloaded in a batch to the conveyor system.

#### General information

The Configurator has been developed for use with the Microsoft Windows 7, 8, or 10 operating system.

The Configurator can be used in English and German. Some system-based information is always shown in the language used by the operating system regardless of the language set. For some technical terms a translation has not been provided in order to aid understanding of the content.

The ConveyorControl system does not implement any safety functions related to the operation of a conveyor system, neither for personal protection, nor for protection of the system or the material. The user is responsible for ensuring that dangerous operating states cannot arise under any circumstances.

Changes to the software, including reverse engineering, are not permitted.

Liability for any damage to the user or third parties resulting from the installation and use of this software is ruled out.

#### Install software

The Configurator is included on a USB stick with each CentralControl and each GatewayControl. The USB stick cannot be purchased separately. The most current version of the Configurator can also be downloaded from [www.interroll.com](http://www.interroll.com).



When connecting for the first time to a CentralControl or GatewayControl supplied with operating voltage, the driver for the relevant USB port is installed. To this end, administrator rights are necessary.

- ▶ Ensure that administrator rights are available on the computer.
- ▶ Insert the USB stick into the computer.
- ▶ If the autorun function is activated on the computer, installation starts automatically.
- ▶ Follow the instructions in the installation dialog.



The Configurator can be installed any number of times on any number of computers.

#### Basic information

In the Configurator, the conveyor system is called a project. Any number of projects can be created. Only one conveyor system can be planned for each project. Planning comprises five steps. These steps are shown by gray arrows in the upper section. The selected step is shown in yellow.

## Interroll ConveyorControl

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### Planning

Mapping the conveyor system, preparing the addressing and parameterization of the modules can be performed without an existing connection to the conveyor system. There must be a USB connection to the conveyor system for addressing and to download the parameters to the modules.

A conveyor system must consist of several ConveyorControl modules. Each of these modules can be parameterized individually. All parameter values have upper and lower limits; some values are subject to a plausibility check. If decimals are entered as parameter values, a decimal comma must be used in the German setting, and a decimal point must be used in the English setting.



The project file is transferred to the ConveyorControl system by the Configurator. It can be exported again using the import function of the Configurator. The project file should be backed up for subsequent changes. If an existing system is changed, this project file can be used.

### Operating instructions

The operation of the Configurator is based on the functionalities for graphical user interfaces. Elements can be selected by a mouse click or via a selection frame drawn with the mouse. Several elements can be selected if they are clicked while the CTRL key is pressed. All elements are selected with the key combination CTRL + A. Selected elements are shown in yellow.

Fields that cannot be changed are shown in light gray. Buttons that cannot be used are either hidden or shown in light gray.

Operating and function errors are indicated by corresponding screen messages. Work with the Configurator can only continue once the cause of the error has been remedied and the logical order of the operating steps has been adhered to or once all input conditions have been satisfied.

The size of the elements in the working area can be changed by zooming; to do so, move the mouse wheel while pressing the CTRL key.

### Definition of terms

- **Zone:** The conveyor line is divided into zones. The zone length is based on the length of the longest package. A zone consists of a RollerDrive, several idling rollers, a control module, and a zone sensor (see "*Zero pressure accumulation conveying*", page 15). In the Configurator, a zone is symbolized by a gray rectangle (see "*Constructing the conveyor line*", page 35).
- **Slave RollerDrive:** For some applications, the use of an additional RollerDrive per zone is required. The ConveyorControl system allows for connecting a second RollerDrive (slave RollerDrive) to a SegmentControl. This is only possible if the SegmentControl within the Configurator has been assigned to one zone only. The parameter PZ4 allows for selecting the SegmentControl to which the slave RollerDrive is connected. The properties of the slave RollerDrive can be set separately, but it is recommended that the same parameters be used for the slave RollerDrive and RollerDrive. The error response of a slave RollerDrive follows that of the regular RollerDrive of the zone. An error display occurs at the module to which the slave RollerDrive is connected, as well as at the module that controls the slave RollerDrive.
- **Module:** Component of the ConveyorControl system (ComControl, SegmentControl, CentralControl or GatewayControl)

## Interroll ConveyorControl

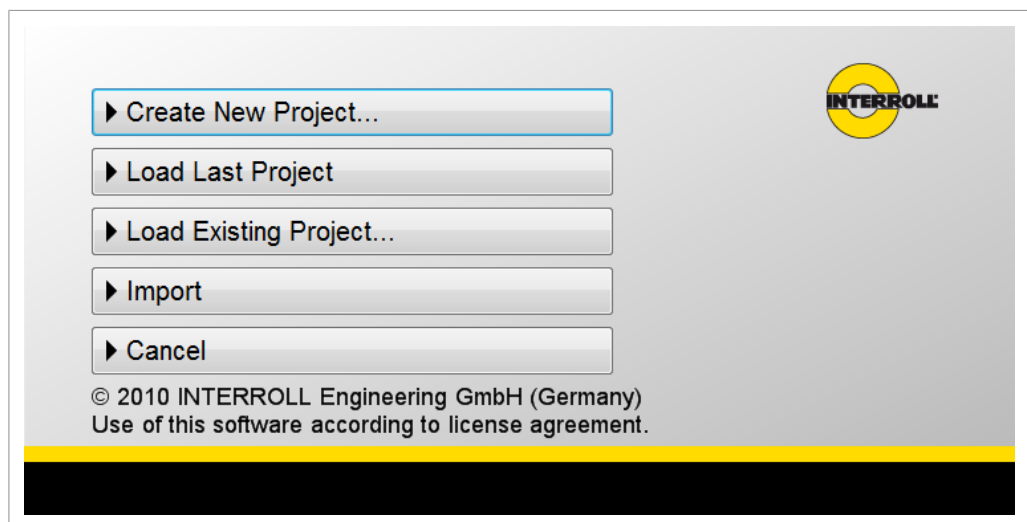
### Planning

- **Conveyor line:** A conveyor line consists of any number of zones (max. 200) that are connected to each other. There is only one start and one end zone.
- **Conveyor system:** A conveyor system can consist of several conveyor lines. As such there are several start and end zones. In terms of the conveyor logic, the conveyor lines work independently. Global signals, such as *Clear* or *Conveyor direction switch*, always refer to the entire conveyor system.
- **Power reset:** Turns off the power supply to the entire conveyor system and then turns it on again (after a minimum of 3 seconds). If a conveyor system is fed by several power supplies, all power supplies must be switched on within a window of no more than 10 seconds.
- **System restart:** A system error can be reset with a system restart.

### Starting the Configurator

- ▶ Start the ConveyorControl Configurator program.

The start screen appears in which a yellow progress bar shows the loading progress. Once the Configurator has been fully loaded, the following selection window appears:



- ▶ Select the desired option.

## Interroll ConveyorControl

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### Planning

#### Creating a new project

A new project should be created for every conveyor system.

- ▶ Enter the project name.
- ▶ Click the button behind the *Storage path* field to select the storage path.
- ▶ Enter the country of application.
- ▶ Click the OK button.



When creating/opening a project file, a temporary, hidden lock file with the name "lock.projectname.xml" is created. This serves to prevent the project file from being opened by several users simultaneously and also to automatically save the project content every two minutes. When the project file is closed properly, the temporary file is automatically deleted. If the Configurator is not exited properly, the lock file is not deleted and prevents any further editing of the project file.

- ▶ If the changes made before the program termination should not be saved, delete the file "lock.projectname.xml". If the file is not shown, activate the option to display hidden files in the file manager.
- ▶ If the changes made before the program termination should be saved, rename the file "lock.projectname.xml" to "projectname.xml". If the file is not shown, activate the option to display hidden files in the file manager. If necessary also rename or delete the old project file.

#### Loading the last project

This option opens the project that was last edited. This is the data on mapping, address planning, as well as the parameters as last edited.

#### Loading an existing project

This option opens the Windows dialog window for selecting files.

- ▶ Search for and select the desired project file.

#### Import

This option exports the project file stored in the modules.

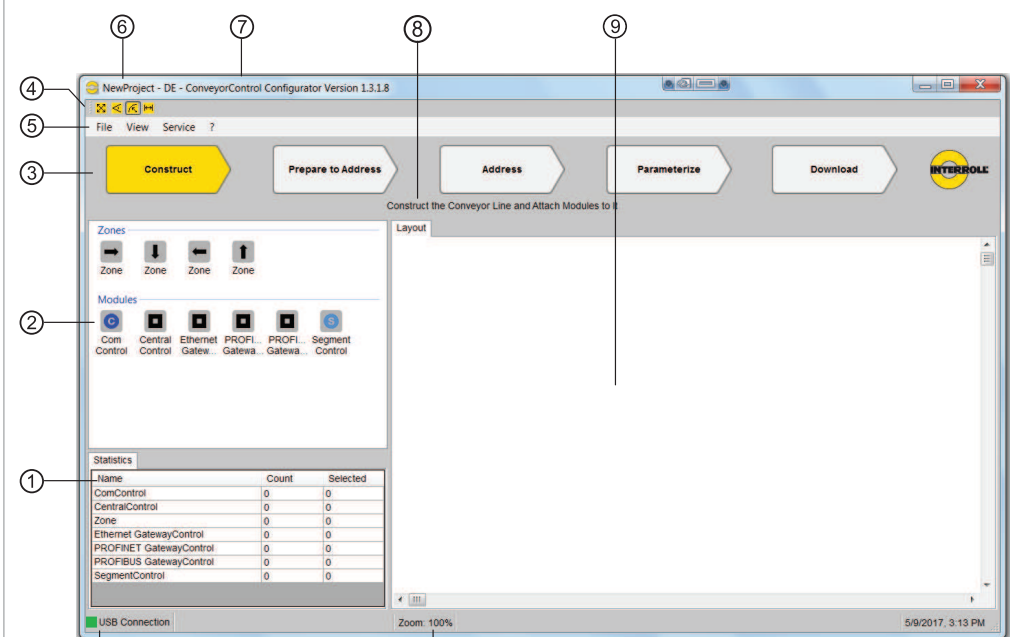
#### Cancel

Closes the Configurator.

# Interroll ConveyorControl

## Planning

### User interface



The screenshot shows the 'NewProject - DE - ConveyorControl Configurator Version 1.3.1.8' window. The interface includes a menu bar (5), a step bar (3) with buttons for 'Construct', 'Prepare to Address', 'Address', 'Parameterize', and 'Download', and a main work area (9). On the left, there are sections for 'Zones' (6) and 'Modules' (2). At the bottom left, a 'Statistics' table (1) displays counts for various components. A 'USB Connection' indicator (11) is at the bottom left, and a 'Zoom: 100%' display (10) is at the bottom center. The project name (6) and software name/version (7) are shown at the top left. A step description (8) is located below the step bar. The Interroll logo is in the top right corner.

.Name	Count	Selected
ComControl	0	0
CentralControl	0	0
Zone	0	0
Ethernet GatewayControl	0	0
PROFIBUS GatewayControl	0	0
SegmentControl	0	0

- 1 Statistics field (shows the number of used and selected zones and modules)
- 2 Function area (depending on the activated step, the available elements/functions are shown)
- 3 Step bar
- 4 Button bar (buttons for processing the zone geometry)
- 5 Menu bar
- 6 Project name
- 7 Name and version of the software
- 8 Step description (information on the corresponding active step)
- 9 Work area
- 10 Zoom display
- 11 Connection status (indicates whether the computer is connected to a CentralControl or a GatewayControl)



## Interroll ConveyorControl

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### Planning

#### Menu bar

The functions in the *File* menu are common in Windows (*New, Open, Save, Save as, Close*). In addition, the zone designations can be exported here.

In the *View* menu, the following functions are available:

- *Language*: After installation English is set, each time the program is called up, the language last used is set.
- *Show zone corner points*: The marking points are shown at the zone symbol corner points. \*
- *Show zone docking points*: Circles are displayed at the possible docking points of the zone symbols as snap points. \*
- *Zones show Node ID / Zones show user zone designation*: Switches between visualization of the actual zone address and the zone designation assigned by the user. By default, the user zone designation is shown, the node ID is required for determining the zone address (see "*PLC process map – Cyclical data*", page 106).

\* graphical display see "*Constructing the conveyor line*", page 35

The *Service* menu offers the following functions:

- *Report*: The parameter settings of the modules and zones can be displayed in table form. Various templates are available. The tables can be saved in the .csv format.
- *Global commands*: The functions *System Restart*, *Conveyor System Start/Stop* and *Conveyor System Clear* can be activated.
- *Ping*: Checks the bus communication of the modules.
- *Diagnostics*: If system errors occur, the cause of the error can be determined with the diagnostics function. Before you use the function, please contact Interroll.



The diagnostics function is enabled by clicking the *Fault Events On* button. After finishing the diagnostics, the function must be disabled.

- *FW Update*: Files for a firmware update are provided by Interroll. Before you use the function, please contact Interroll.
- *Import*: Reads out the project file from the modules.

## Interroll ConveyorControl

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### Planning

#### USB connection status

This symbol indicates whether the computer is connected to a CentralControl or a GatewayControl.



**Connected**



**Disconnected**

### Functional concept

The Configurator is divided into five steps that are based on the order of the steps when configuring a conveyor system:

- *Construct* (see "*Constructing the conveyor line*", page 35)
- *Prepare to address* (see "*Prepare to address*", page 38)
- *Address* (see "*Addressing modules*", page 65)
- *Parameterize* (see "*Parameterizing modules*", page 40)
- *Download* (see "*Downloading parameters*", page 69)

The individual steps are selected by clicking the corresponding button on the step bar. Deviations from the specified order of processing are possible. The steps *Construct*, *Prepare to address* and *Parameterize* can be executed in preparation without the computer connected to the conveyor system. Once the connection is established, the steps *Address* and *Download* can be executed.

#### **Construct**

In the *Construct* step, the conveyor system is replicated in a graphical interface from individual zones and modules. The length of the zones can be randomly changed and/or they can be bent.

#### **Prepare to address**

For communication of the modules, each module must have a unique address. The addressing order is specified in this step.

#### **Address**

The modules are addressed in this step. Since the computer has to be connected to the conveyor system for this purpose, this step is described in the chapter "Startup" (see "*Addressing modules*", page 65).

#### **Parameterize**

Parameters must be assigned to each module. All parameters are set with meaningful standard values. At least the following parameters must be adjusted for a functioning system: RollerDrive speed, gear ratio, and direction of rotation.

#### **Download**

Once all parameters have been set, the settings must be downloaded to the modules. Since the computer has to be connected to the conveyor system for this purpose, this step is described in the chapter "Startup" (see "*Downloading parameters*", page 69).

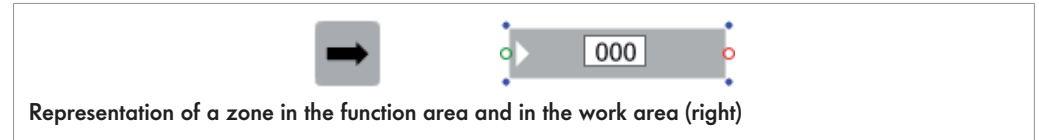
## Interroll ConveyorControl

### Planning

#### Constructing the conveyor line

The conveyor line is replicated in the Configurator in this step. Virtual zones with different conveyor directions and ConveyorControl modules are available for this purpose.

In the Configurator, a zone is symbolized by a rectangle:




The arrow shows the conveyor direction. The red and green circles are snap points; these can be used to connect several zones. The blue dots show the corner points. The snap and corner points can be hidden (see "Menu bar", page 33). The number is the zone designation (the last three digits of the zone designation are always shown).


A zone contains at least one RollerDrive and one zone sensor, but these are not represented separately. Zones that have been selected are highlighted in yellow.


#### Positioning zones

- ▶ Drag a zone from the function area to the work area with the mouse button pressed.
- ▶ To change the shape of the zone, click one of the zone's snap points and drag it with the mouse button pressed. Reshaping can be restricted by using the button bar as follows:

 Zone can be freely shaped

 Shaping with a constant angle of curvature

 Shaping with a constant radius

 Shaping with a constant length

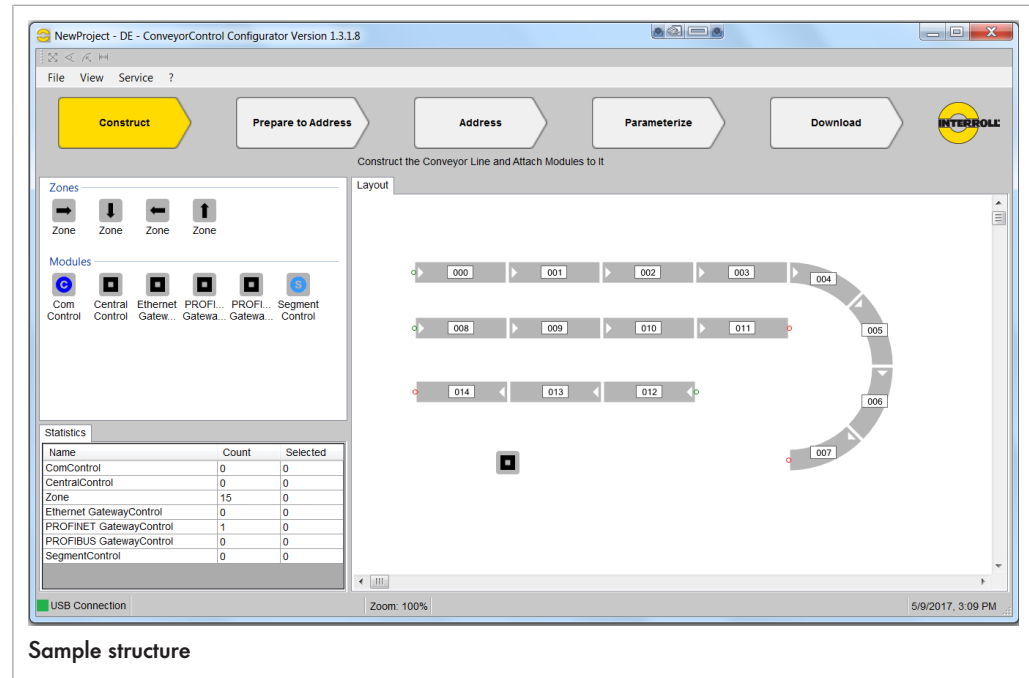
- ▶ To change the angle of curvature in a controlled manner, click the zone with the mouse wheel.  
This causes the zone to be curved by 15° with each click.
- ▶ Attach further zones in the same way.
- ▶ To connect two zones, merge their snap points.  
The zones are docked together.



Zones that are to be connected, must have the same conveyor direction. Only zones that have been docked together are functionally connected.

- ▶ To release docked zones, move these quickly with the mouse button pressed. Slow dragging does not result in separation to avoid accidental break-up of a zone connection.
- ▶ To delete one or several zones, mark these and press the DEL key or right-click the marked zone and select *Delete object*.

## Planning



### Changing the zone designation

The zone designation is shown as a threedigit number by default; that number is automatically incremented. The zones can be renamed, if necessary, in order to use custom, more appropriate designations.

- ▶ Click the zone designation.
- ▶ Enter an alternative zone designation (max. 16 characters) and confirm using the Return key. In the Configurator, the last three characters of the zone designation are shown.
- ▶ To cancel renaming, press the ESC key.

Even if the zone designation is changed, the actual zone address in the background remains the same. If necessary, an allocation matrix can be exported in which the actual zone address for each user zone designation is listed.

- ▶ To export the matrix, select the command *Export zone designation....* in the *File* menu. The allocation matrix is shown as a two-column table. The first column contains the user zone designation and the second column the actual zone address.
- ▶ To save the matrix in the same folder as the project, click *OK*.
- ▶ To save the matrix in another folder, click the *...* button, select the relevant folder and confirm with *OK*.

## Interroll ConveyorControl

### Planning

#### Allocating modules

Once all zone symbols have been placed in the work area, the ComControl or SegmentControl modules must be allocated to the symbols. Allocation must be identical to the actual conveyor system.

- ▶ Drag a module (ComControl or SegmentControl) from the function area to the work area with the mouse button pressed.
- ▶ Drag the module to the center of the long side of a zone to link it to this zone. If a SegmentControl is to be linked to two zones, drag the SegmentControl between the two zones.



The connection is symbolized by a line on the long side of the zone. This line is the color of the corresponding module (light blue for SegmentControl and dark blue for ComControl).



The module can be allocated to only one side of the zone. The side on which the module is positioned is designated by a blue line. The position must correspond to the actual installation position on the conveyor, otherwise the left and right zones of a SegmentControl will be reversed.

To simplify electrical installation, if possible all modules should be positioned on the same side of the conveyor line. In the case of curves, wherever possible the modules should be placed on the outside conveying radius of the curve as the RollerDrive connection is on that side.

- ▶ Ensure that all zones in the work area are connected to a module.  
Zones and modules without a connection are shown in red when moving to the next step.
- ▶ Delete zones and modules that are not used.

If modules are positioned on different sides, the following points must be taken into account:

- The direction of rotation of the RollerDrive must be correctly parameterized (see *"Parameterizing modules"*, page 40).
- When laying the flat cable for bus communication and the power supply to the other side, more flat cable is used (see *"Changing the installation side"*, page 54). This must be taken into account during planning to avoid exceeding the maximum permissible length (200 m).
- ▶ To release the connection, mark the blue line (it turns yellow) and drag it away with the mouse button pressed.  
A zone can also be moved, reshaped or deleted along with its allocated module.

#### Assigning CentralControl or GatewayControl to the conveyor system

A CentralControl or GatewayControl is required for every conveyor system. It is not connected to any zone.

## Interroll ConveyorControl

### Planning

- ▶ Drag a CentralControl or GatewayControl from the function area to the work area with the mouse button pressed.  
It can be positioned anywhere in the work area.



If no CentralControl or GatewayControl exists in the work area, an error message is displayed when moving to the *Address* step.  
Only one CentralControl or GatewayControl can be assigned to the conveyor system at a time. If a selection is incorrect, the incorrect module must first be deleted in the work area before it can be replaced with the correct one.

Name	Count	Selected
ComControl	3	0
CentralControl	0	0
Zone	15	0
Ethernet GatewayControl	0	0
PROFINET GatewayControl	1	0
PROFIBUS GatewayControl	0	0
SegmentControl	6	0

**Zones with allocated modules**

The following points must be considered for concentricity:

- The ends of the bus line must not be connected with each other.
- The conveyor must have a defined start and end zone in the *Construct* step. This means there must be a point at which two zones are not connected to each other.

### Report function

The module information and system parameters can be saved for documentation in the .csv file format. The report function is located in the *Service* menu. Various templates are available for a better overview. The layout of the columns can be changed within the templates and saved. Columns can be shown and hidden by right-clicking in the report window.

### Prepare to address

The addressing sequence is planned in this step. Details about the addressing step see "*Addressing modules*", page 65.

Each conveyor line must be addressed separately. If several conveyor lines belong to one conveyor system and are thus planned in the Configurator in one project, the addressing must be prepared individually for each route.

## Interroll ConveyorControl

### Planning



The difference between a zone and a module must be observed. Only modules are addressed and not zones. A SegmentControl can be connected to two zones, but it receives only one address.

Prerequisites:

- All zones in a conveyor line must be docked to each other.
- Each module (SegmentControl or ComControl) must be allocated to at least one zone.
- A conveyor line must have a start and an end zone.
- Address planning is only possible in the conveyor direction.

▶ Click the *New Route* button.

A new route is shown in the route list.

▶ Select the module that is to be addressed first.

The zone's conveyor direction display changes from white to black.

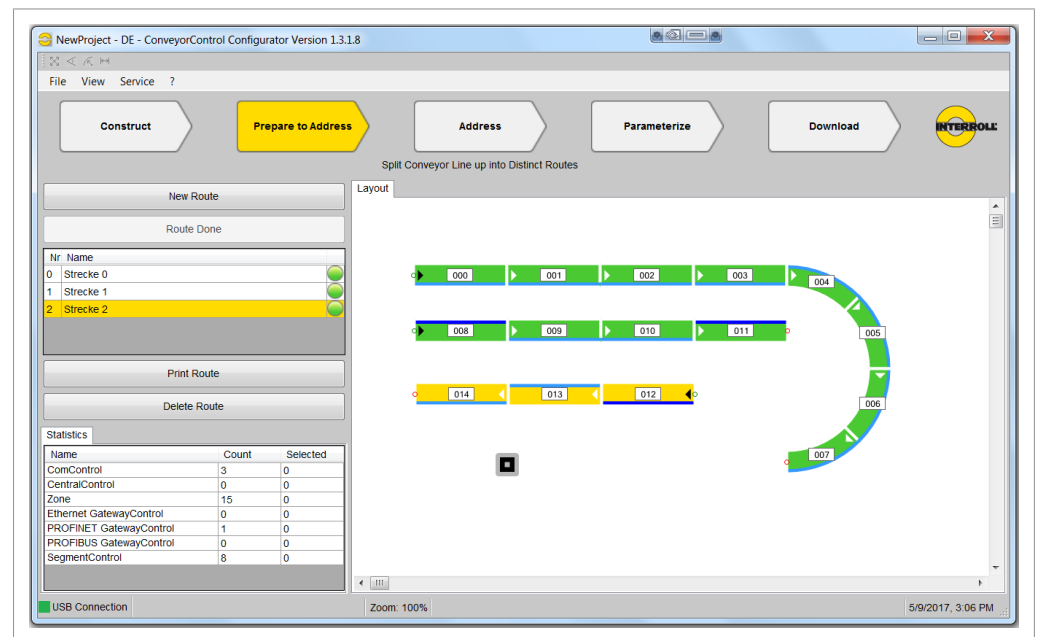
▶ Select the module to be addressed last. The end module selection can be changed any number of times.

The selected route is shown in light brown.

▶ Click the *Route Done* button.

The route is now completely defined and is shown in green. The conveyor line can be divided into several addressing spans. The addressing lines are consecutively numbered during their creation. The route name can be changed by clicking it.

▶ If addressing is to be changed, mark the route in the route list, click the *Delete Route* button and create the route again.



The button *Print Route* is only available if a route has been completed and is selected in the route list. In complex conveyor systems, printing a route can provide a better overview and thus facilitate addressing.

## Interroll ConveyorControl

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### Planning

Downloading the addresses to the modules is described in the chapter Startup (see "Addressing modules", page 65).

### Parameterizing modules

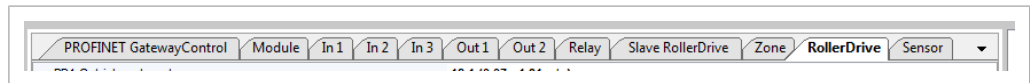
Given the numerous possible applications, the individual modules have to be parameterized to determine which functions the conveyor system has to perform.

In this step the settings for the various parameters can be determined. But the parameters only take effect once they have been downloaded to the modules (see "Downloading parameters", page 69).

The parameters are combined into groups:

- *Zone*
- *RollerDrive*
- *Sensor*
- *Module*
- *Slave RollerDrive*
- *In 1* (module label: Zone Sensor)
- *In 2* (module label: Add Sensor)
- *In 3*
- *Out 1*
- *Out 2*
- *Relay*
- *CentralControl*
- *GatewayControl*

These groups are shown in the function area as tabs.

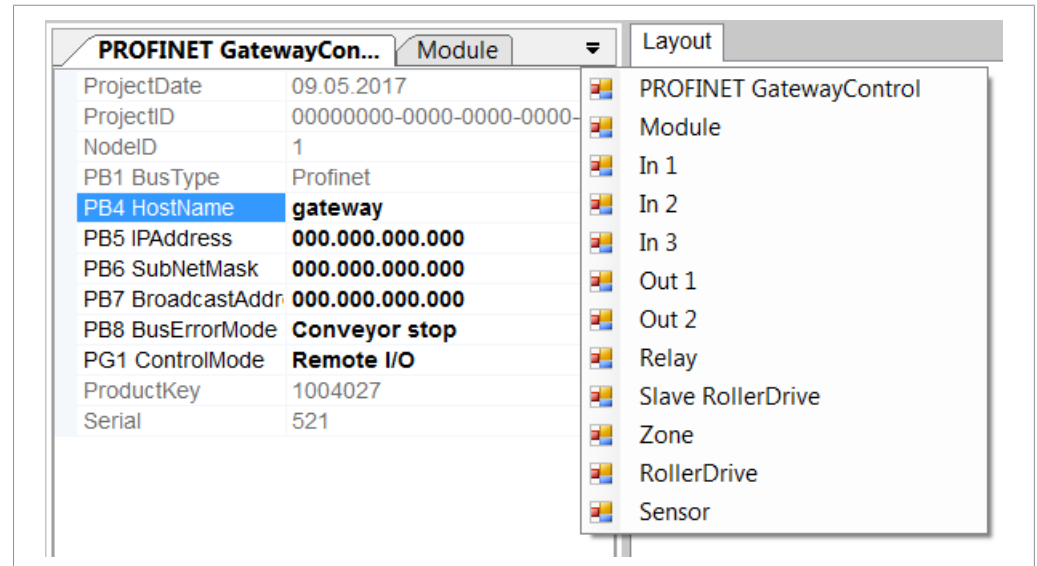


The hidden tabs can be called up with the arrow to the right of the tabs.



## Interroll ConveyorControl

### Planning



- ▶ To position tabs in the work area, drag the name of the tab to any position while pressing the left mouse button.

The tabs are only shown after selecting a module.

#### Limiting the parameters

The parameters are determined via selection lists or by entering values. The upper and lower limits of the selection lists ensure that the settings of the parameters are meaningful. The meaningful interplay of the settings of all parameters is the responsibility of the user since it depends on various boundary conditions (specific dimensioning of the conveyor system, properties of the material, sensors and RollerDrive used, interface signals, etc.).

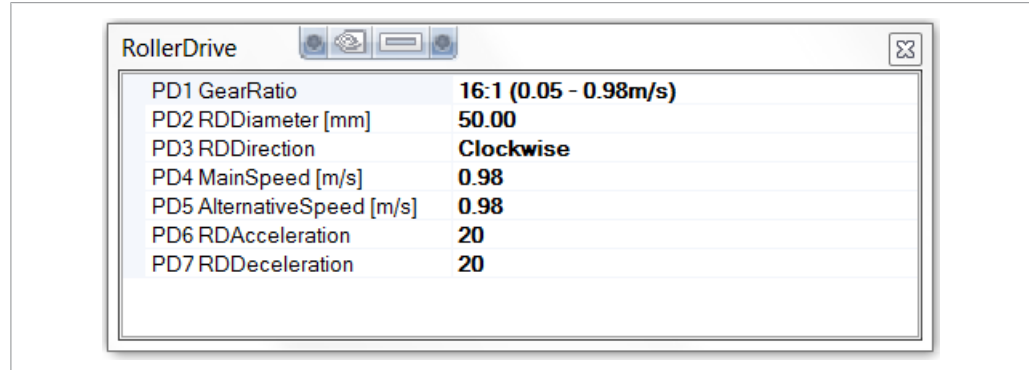
Only the following parameters from the tabs *RollerDrive* and *Slave RollerDrive* are subject to a plausibility check:

- *PD1 GearRatio*
- *PD2 RDDiameter*
- *PD4 MainSpeed*
- *PD5 AlternativeSpeed*

## Interroll ConveyorControl

### Planning

Example:



Parameter	Value
PD1 GearRatio	16:1 (0.05 - 0.98m/s)
PD2 RDDiameter [mm]	50.00
PD3 RDDirection	Clockwise
PD4 MainSpeed [m/s]	0.98
PD5 AlternativeSpeed [m/s]	0.98
PD6 RDAcceleration	20
PD7 RDDeceleration	20

After entering a gear ratio, the possible speed range is shown in parentheses. This value is influenced by the RollerDrive diameter entered. For this reason, both values must be determined before entering the speed. An entry of speeds outside the displayed range is not possible.

In case of conical RollerDrives, the median diameter of the cones must be entered as the diameter.

#### Setting parameters

Prerequisites for setting the parameters:

- The conveyor line was completely mapped in the Configurator (see "Constructing the conveyor line", page 35).
- The following information is available:
  - Position and switching properties of the zone sensors
  - Arrangement of the modules in the conveyor system and the connection layout
  - Type of RollerDrives used (gear ratio, diameter, etc.)
  - Characteristics of the packages (for possible delay times, speed setting, time-out settings, acceleration/deceleration settings etc.)
  - Information about all inputs and outputs and their electrical parameters
  - Additional information, e.g. use of slave RollerDrive

▶ On the step bar, click the *Parameterize* button.

▶ Select one or more modules and/or zones.

The specified parameter values are assigned to each of the selected modules/zones. In most cases we recommend that you select several modules/zones and then change the parameters.

▶ Change the parameters according to requirements. To this end, click the value of the parameter and enter the desired value or select an entry from the drop-down list that is displayed.

If the parameter name is shown in gray, the value cannot be changed.

▶ To reset all parameters of the selected modules/zones to factory settings, click the *Reset Parameters* button.

When creating a new project, all parameters should be checked in principle and, if necessary, adapted.

## Interroll ConveyorControl

### Planning

The following parameters of the connected sensors should be checked:

- *PIN1 SwitchingLogic* (PNP or NPN)
- *PIN2 SwitchType* (normally closed/normally open)



The project file can be read out from the conveyor system at any time by using the import function of the Configurator. To be on the safe side, save the project file and retain it.



The parameters only take effect once they have been downloaded to the modules (see "Downloading parameters", page 69).



The *Reset Parameters* button only affects the previously selected modules.

### Overview of parameters

Below, the setting options of the individual parameters are shown in the order of the tabs.

A detailed explanation of the parameters is listed in the appendix (see "Glossary of parameters", page 97).

#### Zone

This tab includes information about numbering of the previous and next zones, selection of the conveyor logic, the setting of all time parameters, the setting of error responses, and the selection of the number of a SegmentControl to which a second RollerDrive (slave RollerDrive) can be connected.

ID	Name	Meaning	Value range	Default setting
PG1	<i>ControlMode</i>	Centralized or decentralized conveyor control	I/O PLC control Full PLC control	I/O PLC control
PZ2	<i>UpStreamAdr</i>	Address of the upstream zone	Cannot be set	–
PZ3	<i>DownStreamAdr</i>	Address of the downstream zone	Cannot be set	–
PZ4	<i>AdrSlaveRD</i>	Address of the Slave RollerDrive allocated to the zone	No Slave RD	No Slave RD
PZ5	<i>Conveyor logic</i>	Conveyor logic type	Single release Train release	Single release
PZ6	<i>TimeOut1</i>	Time window from the start of the RollerDrive until the sensor becomes unblocked.	1 – 25 s in 0.1-s increments 0 = no time-out	5
PZ7	<i>TimeOut1Reaction</i>	Response when TimeOut1 is exceeded	Ignore error Zone stop + LED flashing	Zone stop + LED flashing
PZ8	<i>TimeOut2</i>	Time from when the sensor in the upstream zone becomes unblocked until own sensor is blocked	1 – 25 s in 0.1-s increments 0 = no time-out	5
PZ9	<i>TimeOut2Reaction</i>	Response when TimeOut2 is exceeded	Ignore error Zone stop + LED flashing Zone unblocked	Zone unblocked

## Interroll ConveyorControl

### Planning

ID	Name	Meaning	Value range	Default setting
PZ10	<i>AfterRunTime</i>	Time from unblocking the sensor until the RollerDrive stops when no additional material follows	1 – 25 s in 0.1-s increments 0 = no run-on	4
PZ11	<i>PermissionDelay</i>	Time between the following statuses: <ul style="list-style-type: none"> <li>• Sensor blocked, zone in status blocked (material halted). Change to unblocked status (sensor unblocked) following removal of the material</li> <li>• Sensor unblocked, "Clear" message to upstream zone</li> </ul>	1 – 25 s in 0.1-s increments 0 = no run-on	2
PZ12	<i>TrainReleaseDelay</i>	Delay in train release	0.1 – 25 s in 0.1-s increments 0 = no delay	0.2
PZ13	<i>SensorDelay</i>	Delay in sensor signal (If the zone has to convey in both directions, the sensor is positioned in the center of the zone and the RollerDrive has to run on for a specified time to allow the material to be transported to the end of the conveyor zone.)	0.1 – 25 s in 0.1-s increments 0 = no delay	0
PZ14	<i>GlobalInitTime</i>	Time for global initialization	1 – 25 s in 0.1-s increments 0 = no initialization	4
PZ15	<i>LocalInitTime</i>	Time for local initialization	1 – 25 s in 0.1-s increments 0 = no initialization	4
PZ16	<i>RDErrorMode</i>	Response in the event of a RollerDrive error	<i>Ignore error</i> <i>LED flashing</i> (RollerDrive is still controlled) <i>Zone stop + LED flashing</i>	<i>Zone stop + LED flashing</i>
PZ17	<i>RDErrorRecovery</i>	Action after remedying a RollerDrive error	<i>No Init</i> <i>Local Init</i>	<i>Local Init</i>
PZ18	<i>SensorErrorMode</i>	Response in the event of sensor low gain	<i>Ignore error</i> <i>LED flashing</i> <i>Zone stop + LED flashing</i>	<i>Zone stop + LED flashing</i>
PZ19	<i>SensorErrorRecovery</i>	Action after remedying a sensor low gain	<i>No Init</i> <i>Local Init</i>	<i>No Init</i>

## Interroll ConveyorControl

### Planning

ID	Name	Meaning	Value range	Default setting
PZ20	<i>TemperatureRecovery</i>	Action when the switch-on temperature is reached after the switch-off temperature has been exceeded	<i>No Init</i> <i>Local Init</i> <i>Power reset required</i>	<i>Power reset required</i>
PZ21	<i>PowerErrorMode</i>	Response in the event that the power supply voltage is too low or too high	<i>Ignore error</i> <i>LED flashing</i> <i>System error</i>	<i>System error</i>

#### **RollerDrive, slave RollerDrive**

This tab includes all parameters for defining the function of the RollerDrive.

A SegmentControl can assume the control of a slave RollerDrive. The data of the slave RollerDrive are set on a separate tab.

ID	Name	Meaning	Value range	Default setting
PD1	<i>Gear ratio</i>	Gear ratio	<ul style="list-style-type: none"> <li>• 9:1</li> <li>• 12:1</li> <li>• 16:1</li> <li>• 20:1</li> <li>• 24:1</li> <li>• 36:1</li> <li>• 48:1</li> <li>• 64:1</li> <li>• 96:1</li> </ul>	12:1
PD2	<i>RDDiameter</i>	Effective drive diameter (with conical RollerDrive, determine the median diameter and enter it)	50 – 80 mm (integers only)	50
PD3	<i>RDDirection</i>	Direction of rotation on cable side	<i>Clockwise</i> <i>Counterclockwise</i>	<i>Clockwise</i>
PD4	<i>MainSpeed</i>	Speed of the RollerDrive	0.01 m/s – 1.75 m/s (max. 2 decimal places)	1.3
PD5	<i>AlternativeSpeed</i>	Alternative conveying speed (can be controlled via a digital input)	0.01 m/s – 1.75 m/s (max. 2 decimal places)	1.3
PD6	<i>RDAcceleration</i>	Acceleration	0 – 20* (integers only) 20 = maximum acceleration	20
PD7	<i>RDDeceleration</i>	Deceleration	0 – 20* (integers only) 20 = maximum delay	20

\* The values that can be set are guidelines. For an overview see "PD6", page 99 and see "PD7", page 99.

#### **Sensor**

This tab includes the parameters for the sensors of a SegmentControl. The function is restricted to the connection of a zone sensor.

## Interroll ConveyorControl

### Planning



One SegmentControl can control two zones. Each zone can be parameterized separately. While setting the parameters, pay attention to whether only one zone or both zones of a SegmentControl have been selected. The specified parameters only apply to the selected zone(s).

ID	Name	Meaning	Value range	Default setting
PIN1	<i>LogicType</i>	Input type		
PIN2	<i>SwitchType</i>	Switch type	<i>Normally open</i> <i>Normally closed</i>	<i>Normally closed</i>
PIN3	<i>LowgainInput</i>	Low gain monitoring	<i>Without</i> <i>With</i>	<i>Without</i>

#### Modules

The parameters of the Modules tab cannot be set, the parameters can only be read out.

ID	Name	Meaning	Value range	Default setting
	<i>NodeID</i>	Numbering	Cannot be set	–
	<i>ProductKey</i>	Article number of the module *	Cannot be set	–
	<i>Serial</i>	Serial number of the module *	Cannot be set	–

\* only displayed after addressing

#### In 1, In 2, and In 3

This tab includes the parameters for the inputs of the ComControl. A zone sensor must be connected to one of the ComControl inputs. The parameter *DigitallInputFunction* must be set to the value "Zone Sensor" for the corresponding input. The tabs are assigned to the connections of the ComControl as follows:

Tab	ComControl connection labeling
<i>In 1</i>	Zone Sensor
<i>In 2</i>	Add. Sensor
<i>In 3</i>	In/Out (terminal box)

ID	Name	Meaning	Value range	Default setting
PIN1	<i>LogicType</i>	Output type	NPN PNP	PNP
PIN2	<i>SwitchType</i>	Switch type	<i>Normally open</i> <i>Normally closed</i>	<i>Normally closed</i>
PIN3	<i>LowgainInput</i>	Low gain monitoring (not available for <i>In 3</i> )	<i>Without</i> <i>With</i>	<i>Without</i>

## Interroll ConveyorControl

### Planning

ID	Name	Meaning	Value range	Default setting
PIN4	<i>Function</i>	Function assignment sensor input* (not available for SegmentControl, function = Zone Sensor)	<i>Not used</i> <i>Zone Sensor</i> <i>Start Sensor</i> <i>Start D one zone</i> <i>Start Z one zone</i> <i>Stop D one zone</i> <i>Stop D all zones</i> <i>Stop Z one zone</i> <i>Stop Z all zones</i> <i>Clear</i> <i>Clear reverse</i> <i>Alternative speed</i> <i>Conveyor direction</i> <i>System restart</i>	In 1 = Zone Sensor In 2 = <i>Not used</i> In 3 = <i>Not used</i>

\* Exactly one input must be parameterized for the *Zone Sensor* function. The *Start Sensor* function may be connected only to an input of the ComControl that controls the first zone of the conveyor. If functions (e.g. *Stop D all zones*) are defined for several inputs, they are linked with **OR**.

## Interroll ConveyorControl

### Planning

**Out 1, Out 2, and Relay** This tab includes the parameters for the outputs of the ComControl in the terminal box.

ID	Name	Meaning	Value range	Default setting
POUT1	<i>LogicType</i> (only with <i>Out 1</i> and <i>Out 2</i> )	Output type	PNP (cannot be set)	PNP
POUT2	<i>SwitchType</i>	Switch type	<i>Normally open</i> <i>Normally closed</i>	Normally open
POUT3	<i>Function</i>	Function assignment	<i>Not used</i> <i>Error signal</i> <i>Aux RD start*</i> <i>Zone status</i> <i>Sensor signal</i> <i>Input signal In 2</i> <i>Input signal In 3</i>	<i>Not used</i>
POUT4	<i>SignalDelay</i>	Switch delay	1 – 25 s in 0.1-s increments 0 = no delay	0

\* Output is switched parallel to the RollerDrive.

#### CentralControl

The CentralControl does not have to be parameterized, the parameters can only be read out.

ID	Name	Meaning	Value range	Default setting
PG1	<i>ControlMode</i>	Centralized or decentralized conveyor control	Cannot be set	Decentralized
	<i>NodeID</i>	Numbering	Cannot be set	–
	<i>ProductKey</i>	Article number of the module	Cannot be set	–
	<i>Serial</i>	Serial number of the module	Cannot be set	–

#### Profibus GatewayControl

This tab includes the parameters for defining the functions of the Profibus GatewayControl.

ID	Name	Meaning	Value range	Default setting
PB1	<i>BusType</i>	Name of the bus system	Cannot be set	<i>Profibus</i>
PB2	<i>BusBitrate</i>	Transfer speed of the Profibus	<i>Autodetect</i> <i>9.6 kbit</i> <i>19.2 kbit</i> <i>93.75 kbit</i> <i>187.5 kbit</i> <i>500 kbit</i> <i>1.5 Mbit</i> <i>12 Mbit</i>	<i>Autodetect</i>
PB3	<i>BusAddress</i>	Profibus node address of the GatewayControl		2



## Interroll ConveyorControl

### Planning

ID	Name	Meaning	Value range	Default setting
PB8	BusErrorResponse	System response in case of faults	LED display System error System stops	System stops
PG1	ControlMode	Centralized or decentralized conveyor control	I/O PLC control Full PLC control	I/O PLC control
	ProductKey	Article number of the module	Cannot be set	–
	Serial	Serial number of the module	Cannot be set	–

**Profinet GatewayControl** This tab includes the parameters for defining the functions of the Profinet GatewayControl.

ID	Name	Meaning	Value range	Default setting
PB1	BusType	Name of the bus system	Cannot be set	Profinet
PB4	HostName	Name of the GatewayControl in the network		gateway
PB5	IPAddress	Internet protocol address of the GatewayControl in the network		0.0.0.0
PB6	SubnetMask	Relevant bits for the network prefix of the Internet protocol address		0.0.0.0
PB7	BroadcastAddress	Broadcast address of the GatewayControl		0.0.0.0
PB8	BusErrorResponse	System response in case of faults	LED display System error System stops	System stops
PG1	ControlMode	Centralized or decentralized conveyor control	I/O PLC control Full PLC control	I/O PLC control
	ProductKey	Article number of the module	Cannot be set	–
	Serial	Serial number of the module	Cannot be set	–

**EtherNet/IP GatewayControl** This tab includes the parameters for defining the functions of the EtherNet/IP GatewayControl.

ID	Name	Meaning	Value range	Default setting
PB1	BusType	Name of the bus system	Cannot be set	Ethernet
PB4	HostName	Name of the GatewayControl in the network		gateway
PB5	IPAddress	Internet protocol address of the GatewayControl in the network		0.0.0.0

## Interroll ConveyorControl

### Planning

ID	Name	Meaning	Value range	Default setting
PB6	<i>SubnetMask</i>	Relevant bits for the network prefix of the Internet protocol address		0.0.0.0
PB7	<i>BroadcastAddress</i>	Broadcast address of the GatewayControl		0.0.0.0
PB8	<i>BusErrorResponse</i>	System response in case of faults	<i>LED display</i> <i>System error</i> <i>System stops</i>	<i>System stops</i>
PB10	<i>DomainName</i>	Domain name of the GatewayControl		
PB11	<i>DNS ServerAddress</i>	IP address of the responsible primary DNS server		0.0.0.0
PB12	<i>DNS ServerAddress2</i>	IP address of the alternative DNS server		0.0.0.0
PB13	<i>NetworkConfigMode</i>	Network settings	<i>Static</i> <i>BootP</i> DHCP	DHCP
PB14	<i>PortSettings</i>	Operating mode and transfer speed of the Ethernet port	<i>Half duplex 10 Mbps</i> <i>Full duplex 10 Mbps</i> <i>Half duplex 100 Mbps</i> <i>Full duplex 100 Mbps</i> <i>Auto</i>	<i>Auto</i>
PG1	<i>ControlMode</i>	Centralized or decentralized conveyor control	<i>I/O PLC control</i> <i>Full PLC control</i>	<i>I/O PLC control</i>
	<i>ProductKey</i>	Article number of the module	Cannot be set	–
	<i>Serial</i>	Serial number of the module	Cannot be set	–
	<i>MACAddress</i>	Ethernet hardware address of the GatewayControl	Cannot be set	–

More detailed description of the parameters see "Glossary of parameters", page 97.

# Assembly and installation

## Warning notices for installation

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### NOTICE

#### Risk of property damage that may cause failure or shortened service life

- ▶ Check each ConveyorControl module before installation for visible damage.
  - ▶ Ensure that the modules are not warped during the installation (no bending or torsion stress).
  - ▶ Do not drill additional mounting holes in the housing or enlarge any existing ones.
  - ▶ Do not drop the modules to avoid internal damages.
- 

### Installation of the ConveyorControl modules

#### Initial installation

The modules are fastened to the conveyor frame with 2 screws (max. diameter 4 mm, not part of the scope of delivery). There are 3 mounting holes at each module fastening point. The left-hand holes should be used for initial assembly.



To simplify electrical installation, if possible all modules should be installed on the same side of the conveyor. In the case of curves, wherever possible the modules should be installed on the outside conveying radius as the RollerDrive connection is on this side.

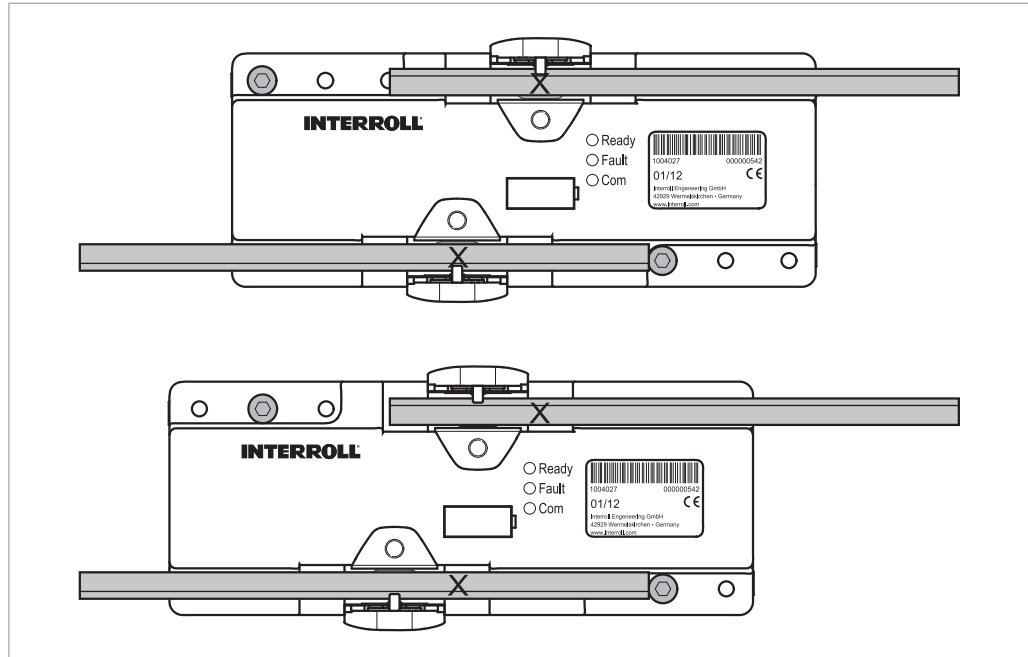
- ▶ Identify a flat area on the conveyor system frame on which the modules are to be installed. Ensure that there is approx. 40 mm space to the left of the designated area to ensure that the module can be moved at a later date if necessary.
- ▶ Use the module as a template and mark the center of each of the left-hand mounting holes. For the distance between the holes, see "*Dimensions*", page 25.
- ▶ Drill two holes with a diameter of 4.5 mm at the markings on the conveyor system frame.
- ▶ Screw the module into the frame.

#### Re-installation

If an already connected flat cable had to be removed from a module, the flat cable must not be pierced at the same point as otherwise a proper contact cannot be ensured. To avoid the flat cable having to be removed and repositioned on all modules, the ConveyorControl module can be attached via the center or right-hand mounting hole in that case. Consequently, the position of the module relative to the flat cable changes, and the flat cable can be pierced at a different point. The insulation is self-healing which means protection rating IP54 is achieved.

## Interroll ConveyorControl

### Assembly and installation



In the top picture, the module is attached via the left mounting hole, in the bottom picture via the central mounting hole. The point at which the flat cable was pierced is marked with X.

### Warning notices for electrical installation



Improper electrical installation can lead to damage of the ConveyorControl.

- ▶ Only have an electrician undertake electrical installation work.
- ▶ Observe national regulations for the electrical installation. Within the EU, IEC 60204-1 must be adhered to at a minimum.
- ▶ Before installing, wiring or removing the ConveyorControl module, de-energize it and ensure that it cannot be started accidentally.
- ▶ The modules may be operated only with DC voltage with a rated voltage of 24 V and a maximum permissible deviation of  $\pm 8\%$ .
- ▶ The modules may be operated only with a protected extra-low voltage (PELV in accordance with IEC 60204-1).
- ▶ Never operate the modules with AC voltage since this will lead to irreparable damage to the device.
- ▶ When connecting the modules, observe the correct polarity of the voltage supply. Reversing the polarity causes irreparable damage to the device and the connected motors.
- ▶ Place all voltage supplies used on a common ground potential to avoid equalizing currents via the modules or the bus line.
- ▶ Ensure that the RollerDrives and voltage sources connected to the ConveyorControl system, as well as the entire conveyor system, are correctly grounded. Incorrect grounding can result in the build-up of static charge, causing the modules to malfunction or fail prematurely.

## Interroll ConveyorControl

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### Assembly and installation

- ▶ Ensure that no hazardous voltage can come into contact with the connections or the housing, not even in the event of a malfunction.
- ▶ Do not use ground connections or grounding wires as a protective conductor (PE).
- ▶ Do not apply too much tension or pressure to the plug. When bending the cable at the plug, the insulation of the cable may be damaged and the modules may fail.
- ▶ Use suitable switching equipment to ensure safe operation.
- ▶ Only apply operating voltage when all cables have been connected.
- ▶ Ensure that the existing electrical installation does not interfere with the ConveyorControl system.
- ▶ Use only cables that are sufficiently dimensioned for the specific operating conditions.
- ▶ Do not forget to observe the calculations for voltage drop on electrical lines.
- ▶ Observe the regulations for routing cables.

### Electrical installation

#### Laying the flat cables

- ▶ Do not bundle the flat cable with other control voltage cables or high-voltage lines. Laying system C or E in accordance with IEC 60204-1 is preferred.
- ▶ Ensure that the overall bus line is no longer than 200 m (including all branches).
- ▶ Do not connect any more branches to a line that branches off from the main line. Branches may only lead off from the main line.
- ▶ Cut off any residual length at the line ends; do not roll up.

---

## NOTICE

### Damage to the flat cable following incorrect laying

- ▶ Do not bend the flat cable on the narrow side.
  - ▶ When bending on the broad side, ensure a minimum bending radius of 12 mm/0.5 in (in a fixed installation) or 30 mm/1.2 in (at flexible points and during storage and transportation).
  - ▶ When laying and when in a fixed installation, ensure that the flat cable is not subjected to tensile stress.
  - ▶ Avoid excessive vibrations, unsupported free-hanging cable, bending and crushing.
-

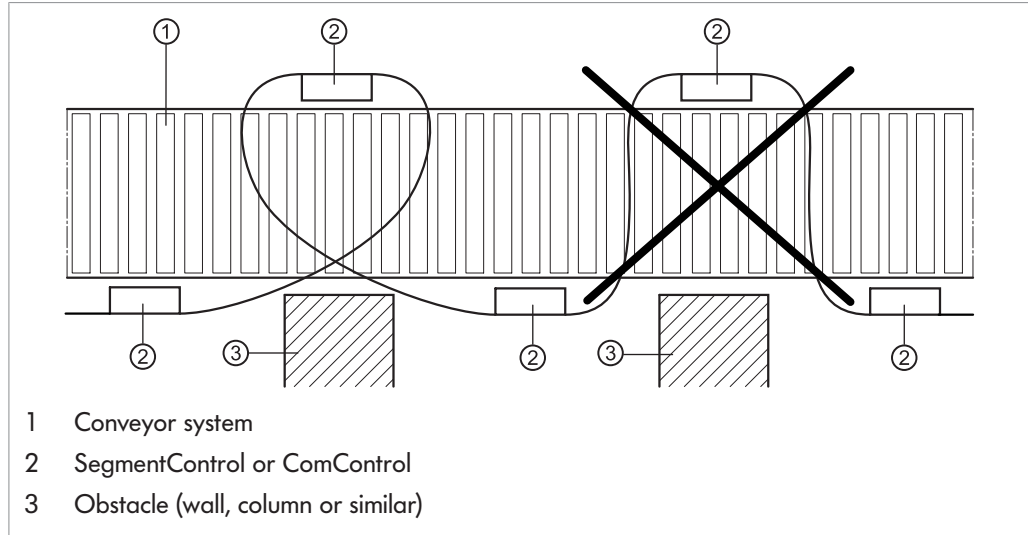
## Interroll ConveyorControl

### Assembly and installation

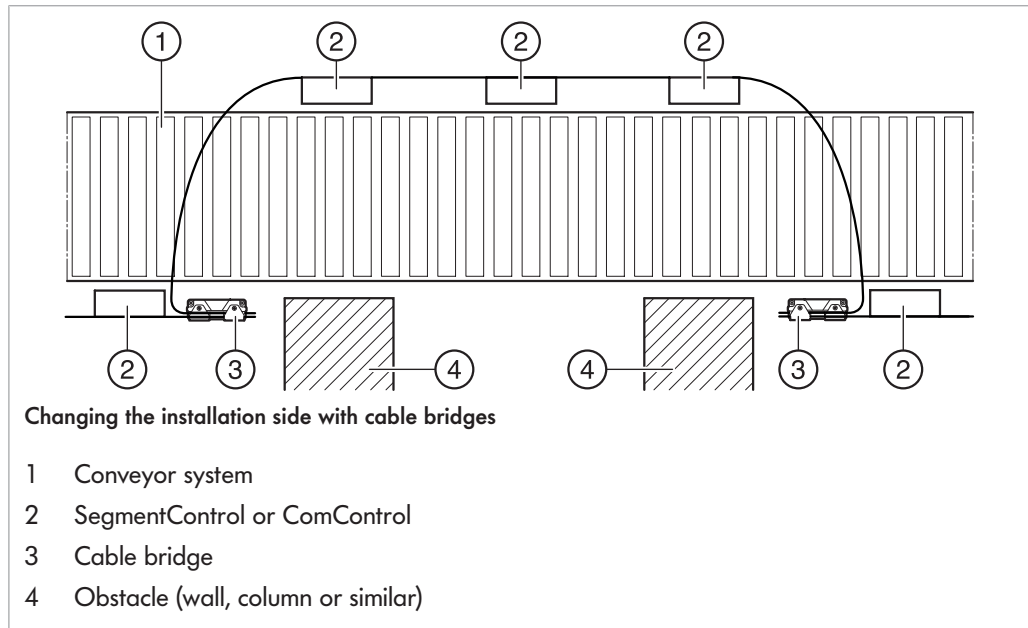
#### Changing the installation side

When changing the installation side, the bus line coding must be observed. There are three options for the change:

Lay the main line in a loop on the other side:



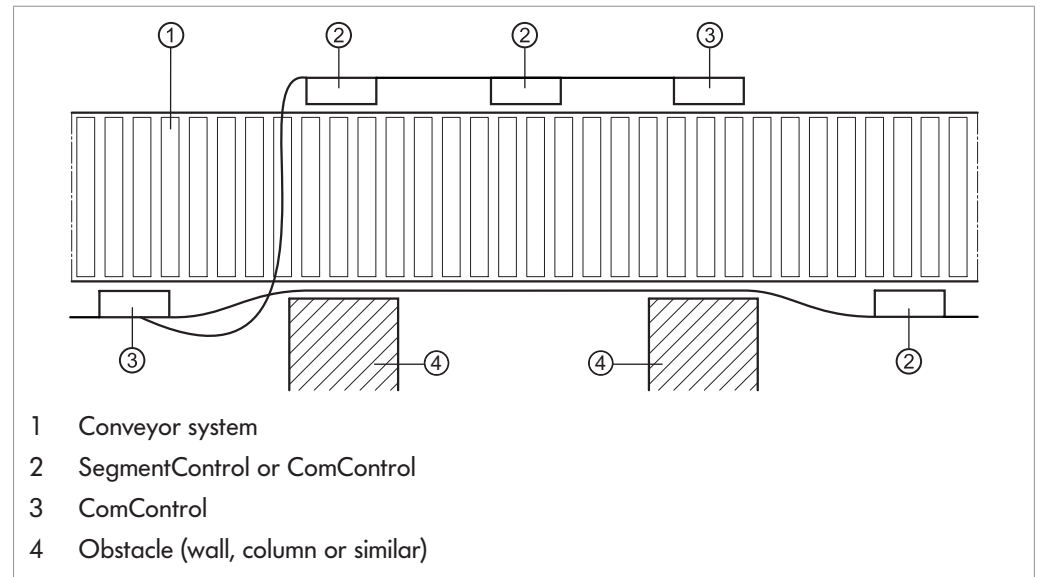
Lay the main line to the other side with a cable bridge. The cable bridge can be used to adapt the bus line coding:



## Interroll ConveyorControl

### Assembly and installation

Branch off a line for the other side: Connection to 'Data A1' or 'Data A2' of a ComControl. The branched line must be terminated at the end with a terminating resistor or a ComControl with activated terminating resistor.



#### Overview of connections

The modules have the following connections:

Module	Connection	Signal/component	Contacting	Type
All	Power	Power supply	Flat cable via pin	IN
All	Data	Bus communication	Flat cable via pin	IN/OUT
CentralControl/ GatewayControl	USB	USB 2.0	USB Mini-B, 5-pin	IN/OUT
GatewayControl	Fieldbus	Profibus Profinet or EtherNet/IP	M12, 5-pin, B-coded acc. to IEC61076-2-101 M12, 4-pin, D-coded acc. to IEC61076-2-101	IN/OUT
SegmentControl	RD left, RD right	RollerDrive	5-pin M8, snap in	OUT
	Sensor left, sensor right	Zone sensor	4-pin, socket M8	IN

## Interroll ConveyorControl

### Assembly and installation

Module	Connection	Signal/component	Contacting	Type	
ComControl	Data A1	Bus branch left	Flat cable via pin	IN/OUT	
	Data A2	Bus branch right	Flat cable via pin	IN/OUT	
	RD	RollerDrive	5-pin M8, snap in	OUT	
	Zone Sensor	Input In 1	4-pin, socket M8	IN	
	Add. Sensor	Input In 2	4-pin, socket M8	IN	
	In/Out (Terminal box)	Input In 3	Spring terminals	Spring terminals	IN
		Outputs Out 1, Out 2	Spring terminals	Spring terminals	OUT
	Relay: electrically isolated relay contact	Spring terminals	Spring terminals	OUT	

The electrical parameters of the connections are specified in the appendix (see "*Electrical data of connections*", page 119).

#### Power supply and bus communication

One flat cable each is used for the power supply and bus communication; these cables are fixed to the modules using yellow tabs.



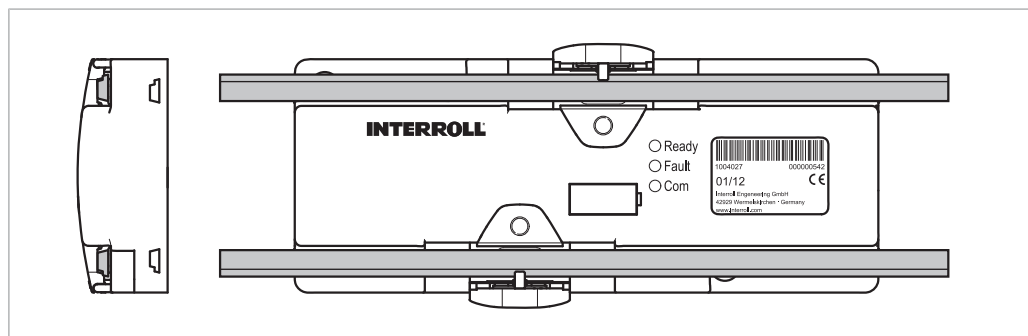
Contact is established by pushing the flat cable onto the contact pins. Closing the tabs is not sufficient for a reliable contact.



If several power supplies are used, the connections for grounding must be placed on a common potential. The correct grounding according to PELV must be observed in the process.

A screwdriver size PZ1 is required for the screws of the tabs (power and data connections) as well as for the cover of the terminal box (see "*ComControl inputs and outputs*", page 58).

- ▶ Ensure that all required modules are installed on the conveyor system.
- ▶ Release the screws on the tabs and open the tabs.
- ▶ Ensure that the flat cables for voltage supply (2 x 2.5 mm<sup>2</sup>, black) and for bus communication (2 x 1.5 mm<sup>2</sup>, yellow) are not mixed up.
- ▶ Lay the flat cable in the right direction (see graphic) without mechanical stress and without tension, if necessary take appropriate measures to reduce tension and vibration.



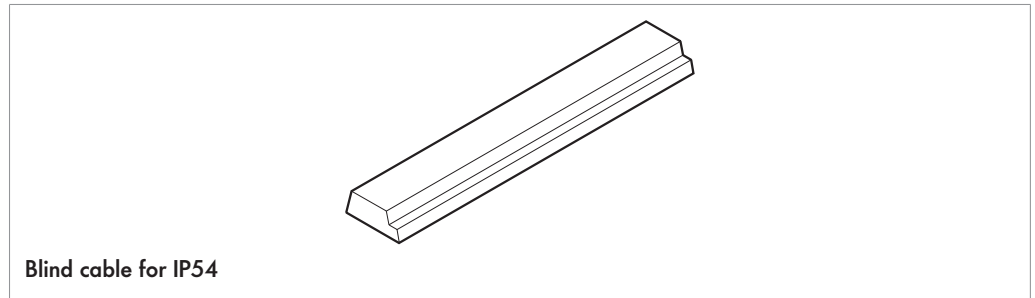
- ▶ Note the orientation label on the side of the modules.
- ▶ Place the flat cable straight on the modules.



## Interroll ConveyorControl

### Assembly and installation

- ▶ Press the flat cable onto the pin under the tab.  
Close the tab and tighten the screw to max. 1.0 Nm.
- ▶ For the ComControl, first establish contact for the connection 'Data A1' or 'Data A2' with branch and blind cables to achieve the protection rating IP54, then establish contact for the 'Data' connection. To improve cabling, press the data flat cable into the recesses on the tabs 'Data A1' and 'Data A2'.



For the ComControl, the main cable of the bus communication must always be connected to 'Data'.

Only one branch-off is allowed per ComControl. Select Data A1 or Data 2 depending on the desired orientation of the flat cable.

- ▶ Terminate the ends of the bus line with a terminating resistor or a ComControl with activated terminating resistor.

#### RollerDrive

The connections 'RD left' and 'RD right' (at the SegmentControl) or 'RD' (at the ComControl) are prepared for RollerDrive EC310.

- ▶ Insert the plug so that the labeling *EC310* points to the rear, i.e. it cannot be read.
- ▶ Always connect the RollerDrive of the left zone to 'RD left', and the RollerDrive of the right zone to 'RD right'. If only one zone is to be controlled, the RollerDrive must be connected to 'RD left'.
- ▶ If a slave RollerDrive is configured, connect the master RollerDrive to 'RD left' and the slave RollerDrive to 'RD right'.

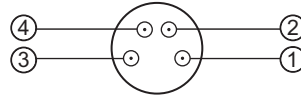
#### Sensors

The inputs 'Sensor left' and 'Sensor right' (at the SegmentControl) or 'Zone Sensor' and 'Add. Sensor' (at the ComControl) feature the same design.

Different functions can be assigned to the sensor inputs of the ComControl. The *Zone Sensor* function is permanently assigned to the sensor inputs of the SegmentControl.

## Interroll ConveyorControl

### Assembly and installation



#### Sensor connection

- 1 +24 VDC
- 2 Sensor error signal (can be parameterized)
- 3 Ground
- 4 Sensor input

### NOTICE

#### Pin 1 is not protected against short circuits

In case of a short circuit the internal fuse trips, thereby destroying the SegmentControl or ComControl.

- ▶ Do not load Pin 1 with more than 100 mA.
- ▶ Do not feed in any voltage via Pins 1 and 3.



At Pin 2 and 4, evaluation of the switching signal (PNP, NPN level) or the sensor switching function (normally open/normally closed) can be parameterized as desired to allow various sensors to be connected.

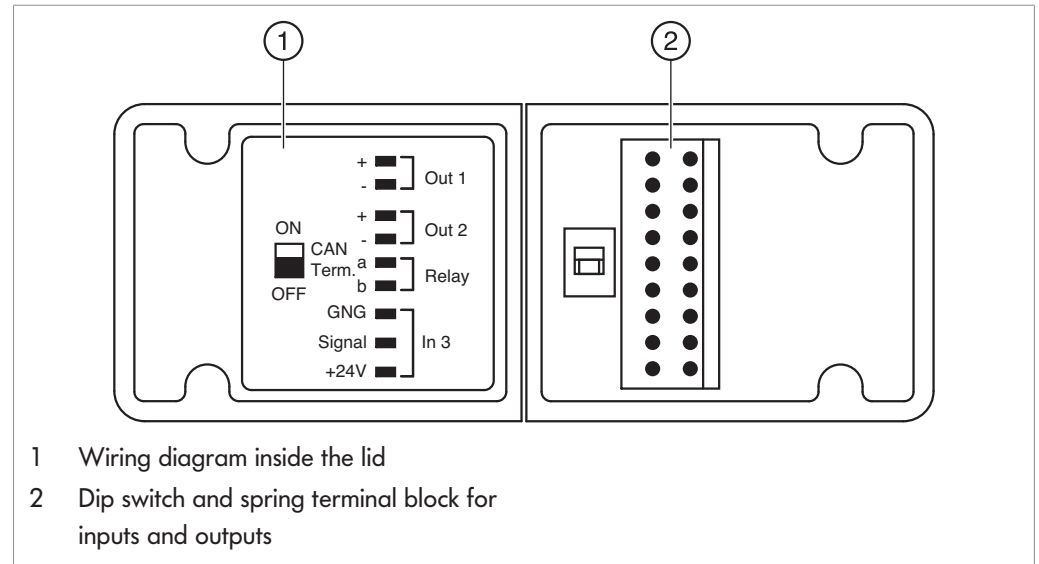
- ▶ Observe the position of the zone when connecting a zone sensor to a SegmentControl: Always connect the zone sensor of the left zone to 'Sensor left', and the zone sensor of the right zone to 'Sensor right'. If only one zone is to be controlled, the zone sensor must be connected to 'Sensor left'.

#### ComControl inputs and outputs

Additional inputs and outputs can be connected to the ComControl terminal box. The dip switch for turning the terminating resistor for the bus line on and off is also located here.

## Interroll ConveyorControl

### Assembly and installation



Connection	Description
Out 1	Digital output. The use of the signal (e.g. as error output) and the switching and function (normally open or normally closed) can be parameterized.
Out 2	Notes: <ul style="list-style-type: none"> <li>• The outputs Out 1 and Out 2 must not be chained.</li> <li>• Feeding voltages to Out 1 and Out 2 is not allowed.</li> </ul>
Relay	Electrically isolated relay contact
In 3	Digital input signal. The evaluation of the signal (NPN or PNP) and the switching function (normally open or normally closed) can be parameterized. The use of the signal, e.g. as a start sensor, can also be parameterized.



All connections in the terminal box are spring terminals for installation without tools. The following conductors can be connected:

- Braid wire 0.2 ... 1.5 mm<sup>2</sup>, solid core or fine-wired without wire end sleeve
- Braid wire 0.25 ... 1.5 mm<sup>2</sup> with wire end sleeve (for wire end sleeve with collar max. 0.75 mm<sup>2</sup>)



The wire gage must be selected according to the highest possible load current.

The cable grommet (TPE) is specified for at most 3 round cables Ø 4.5 ... 6 mm. To simplify attachment and creation of the holes, it can be removed from the housing.

- ▶ Strip 8 mm insulation from the cables.
- ▶ Guide the cables through the grommet and connect to the spring terminals. For simpler operation, the white button can be depressed using a slotted screwdriver (blade width approx. 3 mm) and, in doing so, the terminal can be uncovered.
- ▶ Ensure that the round cables used fit snugly in the cable grommets.
- ▶ Close the cover of the terminal box so that it is flush with the housing, and tighten both screws to 0.8 Nm.

## Interroll ConveyorControl

### Assembly and installation



Operating the ComControl with open terminal box flap or without cable entry is not allowed. The cable entry does not feature a cable relief.

#### USB port

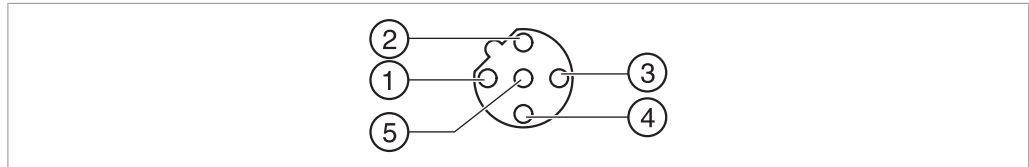
The device is equipped with a USB Mini-B connection to allow the transfer of Configurator data to a PC.

- ▶ Pull off the protective black cap. Do not tear off the mechanism against loss.
- ▶ Connect the USB plug.

#### GatewayControl Profibus connection

The GatewayControl is a Profibus-DP slave and sends or receives information only if queried by a Profibus master (e.g. a PLC). The GatewayControl does not independently communicate with other devices.

The M12 connection is B-coded according to IEC 61076-2-101.

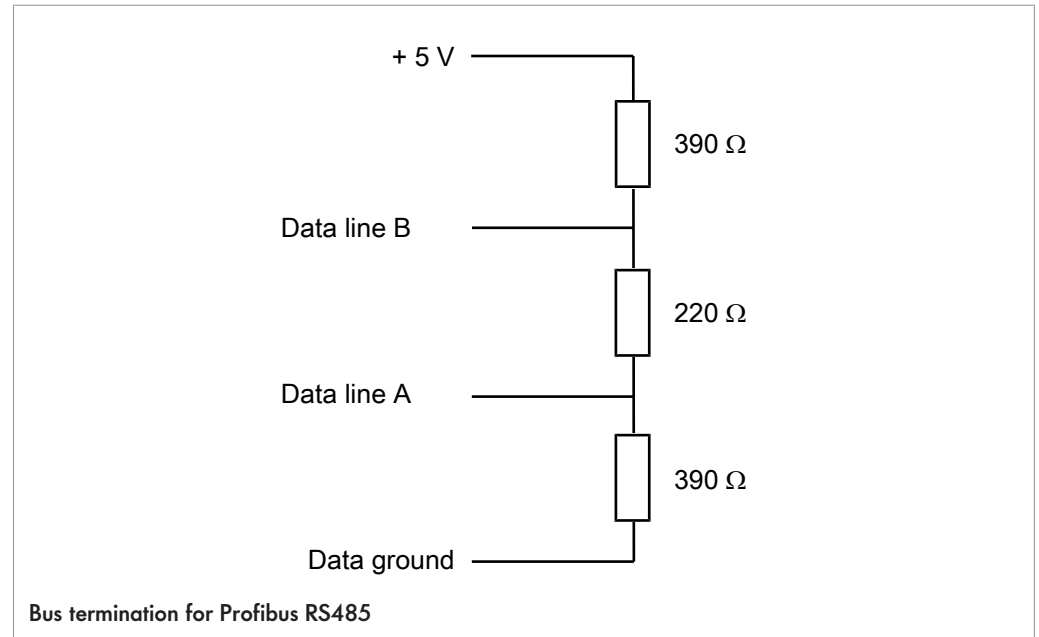


PIN	Signal	Function
1	VP	+5 V voltage supply for bus termination
2	RxD/TxD-N	Data line A (green)
3	DGND	Ground for data and VP
4	RxD/TxD-P	Data line B (red)
5	—	not used
Thread	Shield	Shielding

The planning and installation guidelines by "PROFIBUS and PROFINET International" must be observed for the planning and installation of Profibus systems. They are available online at <http://www.profibus.com>. To ensure a secure signal transfer with Profibus, the Profibus line must be terminated at both ends of a Profibus segment with a bus termination. For the Profibus RS485 used by the GatewayControl, the bus termination consists of a combination of three resistors (see figure). This combination of resistors is installed in many Profibus connectors or available as an M12 plug. If a T or Y adapter is used for connecting an M12 bus termination, ensure that PIN1 and PIN3 are connected through.

## Interroll ConveyorControl

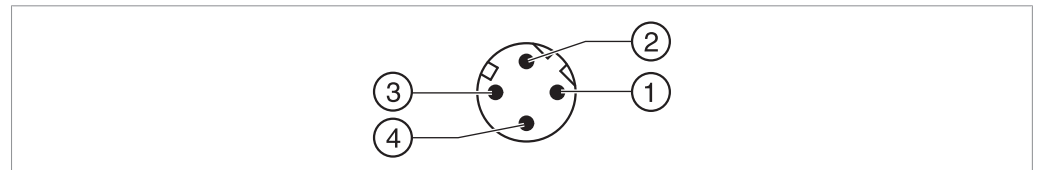
### Assembly and installation



#### GatewayControl Profinet connection

The GatewayControl is a Profinet I/O device and sends or receives information only if queried by the master PLC. The GatewayControl does not independently communicate with other devices.

The M12 connection is D-coded according to IEC 61076-2-101.



PIN	Signal	Name
1	TD+	Transmission Data +
2	RD+	Receive Data +
3	TD-	Transmission Data -
4	RD-	Receive Data -

The planning and installation guidelines by "PROFIBUS and PROFINET International" must be observed for the planning and installation of Profinet systems. They are available online at <http://www.profibus.com>.

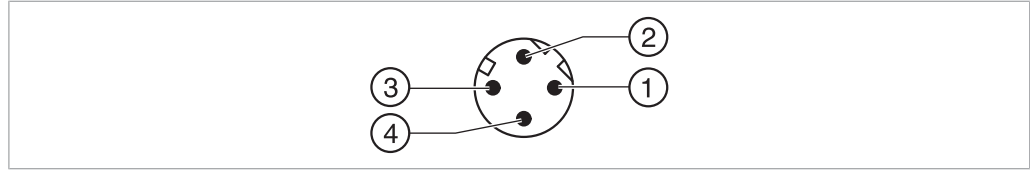
#### GatewayControl EtherNet/IP connection

The GatewayControl EtherNet/IP is a communications adapter and sends or receives information only when queried by a higher-level control system. The GatewayControl does not independently communicate with other devices.

The M12 connection is D-coded according to IEC 61076-2-101.

## Interroll ConveyorControl

### Assembly and installation



PIN	Signal	Name
1	TD+	Transmission Data +
2	RD+	Receive Data +
3	TD-	Transmission Data -
4	RD-	Receive Data -

The ODVA planning and installation guidelines must be observed for the planning and installation of Profinet systems. They are available online at <http://www.odva.org>.

#### Ensuring protection rating IP54

Depending on the use and therefore the switching of the modules, connection options may remain open. To ensure protection rating IP54, these connections must be sealed with protective caps.

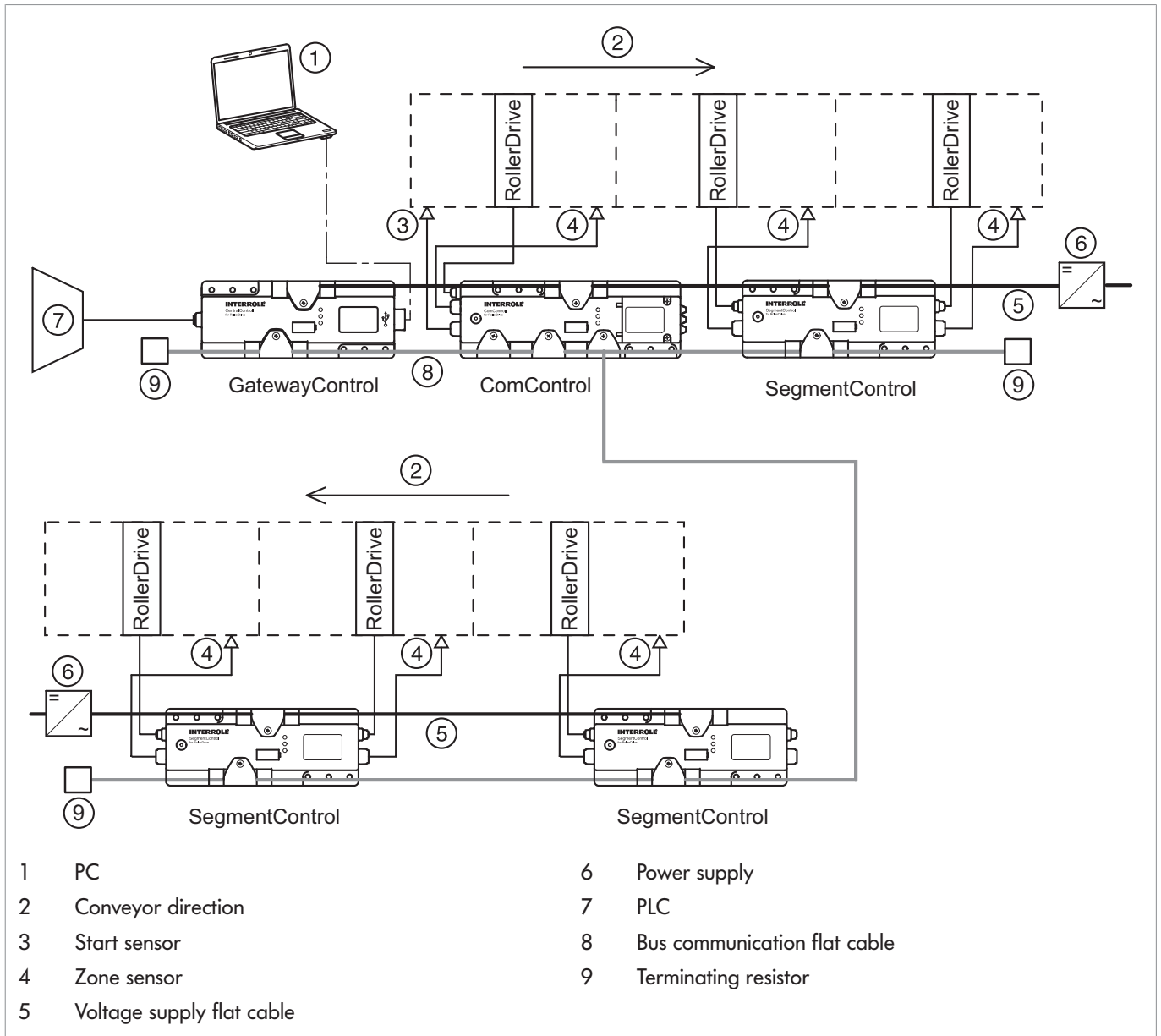
- ▶ Screw M8 blind caps onto all unused sensor connections and RollerDrive connections.
- ▶ If a flat cable ends at a module, attach a suitable end cap to the end of the flat cable.
- ▶ If the connections 'Data A1' or 'Data A2' are not used on the ComControl, insert the enclosed blind cable parts to achieve protection rating IP54.
- ▶ Close the cover of the terminal box for the ComControl so that it is flush with the housing, and tighten both screws to 0.8 Nm. Ensure that the round cables used fit snugly in the cable grommets.
- ▶ Ensure that the USB protective cap is correctly attached at the CentralControl.

## Interroll ConveyorControl

### Assembly and installation

#### Connection example for ConveyorControl system

The example shown is for a conveyor system with six zones. The example contains one GatewayControl, one ComControl and three SegmentControls, as well as two power supplies for the voltage supply, a PC for addressing and parameterization, a start sensor and, for each zone, one zone sensor and one RollerDrive:



The SegmentControls control and monitor one or two zones. The ComControl analyzes the signal of a start sensor and controls one zone. The modules are connected with each other by the flat cables for the bus PC communication. The bus communication is terminated at each end by a terminating resistor. All modules, sensors and RollerDrives are supplied with operating voltage by power supplies and a flat cable.



## Interroll ConveyorControl

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### Assembly and installation

The PC may be connected to the CentralControl or GatewayControl only during addressing and parameterization.



## Initial startup and operation

### Initial startup

#### Checks before initial startup

- ▶ Ensure that all ConveyorControl modules have been correctly fastened to the profile and that all screws have been correctly tightened.
- ▶ Ensure that no additional danger zones have been created by interfaces to other components.
- ▶ Ensure that the wiring is in accordance with the specification and legal requirements.
- ▶ Check all protective devices.
- ▶ Ensure there are no persons in the danger zones of the conveyor system.

#### Checks before each startup

- ▶ Check all ConveyorControl modules for visible damage.
- ▶ Check all protective devices.
- ▶ Ensure that no RollerDrive is blocked.
- ▶ Precisely specify and monitor the placement of the material.
- ▶ Ensure there are no persons in the danger zones of the conveyor system.

### Addressing modules

Each module must be issued a unique address before the conveyor system can be started up. The addressing sequence was already planned in the *Prepare to address* step (see "*Prepare to address*", page 38). Based on this planning, an address must be assigned to every SegmentControl and ComControl by using the addressing magnet.



The GatewayControl is set to node ID 1 at the factory. This ID cannot be changed in the context of the addressing procedure required for the other modules, or assigned to another module.

Prerequisites:

- All route in the conveyor system have been defined and completed in the *Prepare to address* step.
- An addressing magnet is available.

---

## NOTICE

### Damage due to magnetism

Devices that are sensitive to magnets can be damaged and data may be deleted.

- ▶ Do not move the addressing magnet close to devices that are sensitive to magnets or to sensitive data carriers (e.g. bank cards).
-

## Interroll ConveyorControl

### Initial startup and operation

- ▶ Connect the PC to the CentralControl or GatewayControl with the USB cable.  
The Configurator connection status is shown at bottom left.



#### Connected

- ▶ On the step bar, click the *Address* button.

If there is no connection to the CentralControl or GatewayControl, a corresponding error message appears.

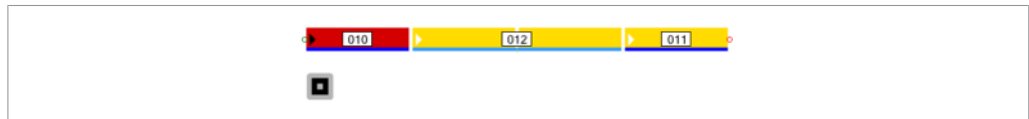
- ▶ Mark the routes in the route list that is to be addressed.

The route is shown in yellow in the route list and in the work area.

- ▶ Click the *Address route* button.

While the modules are being prepared for addressing, a progress bar is shown. The first module to be addressed is then shown in red.

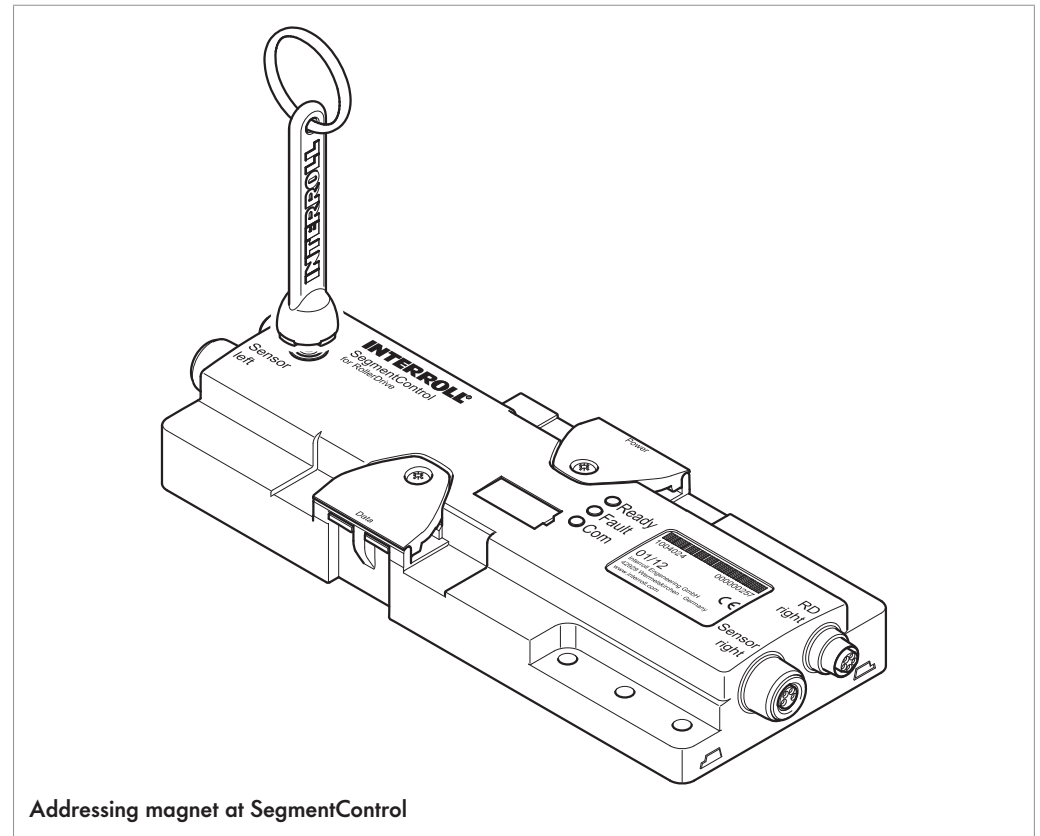
For all modules that are still without a valid address, only the 'Com' LED is illuminated on the conveyor system, if there is no error.



- ▶ To address the modules, hold the addressing magnet for at least 3 seconds to the contact point of the module that corresponds to the module marked in red (position of contact point see "*Structure*", page 19).

## Interroll ConveyorControl

### Initial startup and operation

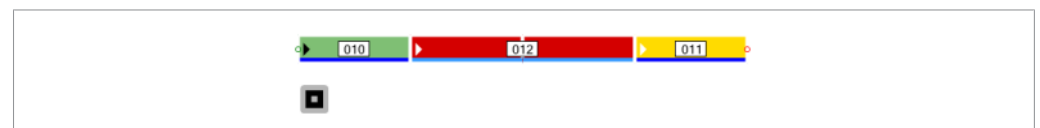


Addressing magnet at SegmentControl



If the modules are installed in a steel profile, the contact point for the addressing magnet may not be in the position marked on the housing surface.

- ▶ Hold the addressing magnet in front of the contact point.  
The 'Fault' LED lights up. After 3 seconds the LEDs 'Com' and 'Fault' flash.
- ▶ Remove the addressing magnet.  
The three LEDs flash synchronously.
- ⇒ The module is temporarily addressed.
- ⇒ In the Configurator, the addressed module is shown in green and the next module to be addressed is shown in red.



A progress bar below the route list shows the ratio of addressed to non-addressed modules.

- ▶ Address all other modules of the conveyor system in the same manner.  
When all modules of a conveyor line have been addressed and the progress bar has run through, the modules are permanently addressed.

## Interroll ConveyorControl

### Initial startup and operation

Successful addressing is displayed as follows:

- The LEDs 'Ready' and 'Com' on the modules are constantly lit and the 'Fault' LED displays a system error since no parameter data are available yet.
- A green dot appears behind the name of the route in the route list in the Configurator. The route in the work area appears green once it is no longer selected.

If addressing at a module is not successful, the process can be repeated any number of times. If necessary, the bus communication must be checked. To repeat the addressing:

- ▶ End the addressing procedure in the Configurator with the *Cancel* button.
- ▶ Reset power.
- ▶ Start addressing again.
- ▶ To reset an address during the addressing procedure, end the procedure with the *Cancel* button and restart the addressing. During a cancellation, all temporary addresses are deleted.
- ▶ If an address is to be deleted after the completed addressing procedure, hold the addressing magnet in front of the contact point of the corresponding module for more than 10 seconds.



If the power fails during addressing or the USB connection is interrupted, addressing must begin again as the addresses cannot be saved permanently until the entire route has been addressed. If there are several routes in a conveyor system, each route must be individually addressed as described above.

### Addressing a replacement module

If an already addressed route is to be addressed a second time, the addresses are not overwritten. The Configurator checks the address of each module. Each module is displayed in green when a valid address is available. The modules are displayed in green step by step. If a module does not have a valid address, the process is stopped at this module and the module can be addressed as described above.

If a module is damaged, it has to be replaced.

Requirement:

- The new module has the default settings before the replacement.
- ▶ Installing a new module. Ensure that the contact is not established at the same point of the flat cable as it was before (see "*Re-installation*", page 51).
- ▶ Switch on the power supply.
- ▶ If the module is not brand new, hold the addressing magnet in front of the contact point of the module for more than 10 seconds to delete any existing addressing.
- ▶ Start addressing as described above.  
The replaced module is displayed in red in the Configurator; all modules located upstream of it in the conveyor direction are displayed in green.
- ▶ Hold the addressing magnet in front of the contact point of the new module for at least 3 seconds and no longer than 10 seconds in order to address it.
- ▶ If necessary, address additional replaced modules in the same way.

A single module can be replaced without having to perform the addressing process and parameter download with the Configurator.

## Interroll ConveyorControl

---

### Initial startup and operation

- ▶ Switch off the voltage supply.
- ▶ Install the new module at the position of the module to be replaced.
- ▶ Switch on the voltage supply and wait until the conveyor system has initialized ('Fault' LED of GatewayControl or CentralControl flashes continuously).
- ▶ Initiate the addressing procedure at the replaced module with the addressing magnet.  
The module is automatically addressed and parameterized.  
Afterwards, the conveyor system initializes and the conveying process is automatically performed.

### Downloading parameters

The parameters that were set in the *Parameterize* step (see "*Parameterizing modules*", page 40) must be downloaded to the conveyor system to be effective.

Prerequisites:

- All modules have been addressed.
- All parameters have been set in the Configurator.
- The computer is connected to the CentralControl or GatewayControl with a USB cable.

---

## NOTICE

### Collisions with external systems during parameter downloading

- ▶ During the parameter download, do not transport any material since input signals may not be processed correctly.

- 
- ▶ On the step bar, click the *Download* button.  
All parameters are downloaded. Depending on the number of modules, this may take several minutes. A progress bar shows the status of the download process.

If parameter downloading is started while the conveyor is in operation, conveying is stopped before the parameters are downloaded.

Before the parameters are downloaded, a compatibility check is performed. It checks whether all modules ensure the full scope of functions. Modules that do not support all functions are shown in red in the compatibility list of the Configurator. To ensure the full scope of functions of the conveyor system, we recommend that you apply the latest firmware to all the modules. If a module is identified that does not feature the full scope of functions, a message window appears. The parameters can still be downloaded.

After the parameter download, the conveyor system automatically performs a global initialization (see "*Initialization*", page 16) and then starts the conveying operation according to the specified parameters. The computer can now be disconnected from the CentralControl or GatewayControl.



The conveyor system can be stopped only with a Stop signal (e.g. via one of the inputs of the ComControl or the corresponding command in the Service menu of the Configurator) or by switching off the supply voltage.

## Interroll ConveyorControl

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### Initial startup and operation

If the parameters cannot be downloaded and saved in the modules, the download is canceled and the 'Fault' LED shows a system error.

- ▶ Check the bus communication in the case of a system error.
- ▶ Reset the system error with a system restart, by selecting a restart of the system via an input signal of the ComControl, via the Configurator under Service/Global Signals or via PLC with Bit 4 in the GSCR.

If during the parameter download the power fails, the USB line is interrupted or the *Cancel* button is clicked, downloading is canceled and an error message appears. The error message must be confirmed before the power to the conveyor system can be switched on again. There is no conveying or initialization for the duration of the error message. If there were parameters in the modules prior to downloading, these will be reactivated following cancellation and confirmation of the error message.



The Configurator project file with the specified parameters should be saved and stored in order to easily make changes at a later date.

### Self-test

The self-test allows the following functions to be checked before the flat cable for bus communication is installed:

- Function and correct connection of the RollerDrives
- Function and correct connection of the zone sensors
- Function of and correct power supply to each module

During the self-test, the connected sensors and RollerDrives are active. This means that the corresponding RollerDrive turns or does not turn depending on whether or not a sensor is blocked. This interaction depends on the sensor's logic type (normally closed or normally open). The 'Fault' LED is constantly lit, the LEDs 'Ready' and 'Com' flash alternately. The self-test lasts 10 seconds.

The self-test can be performed as described above on a ComControl only if that control has been addressed and parameterized. When not addressed, the connected RollerDrive changes its state only if the zone sensor has been connected to IN1 and changes its state.

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## NOTICE

### Damage due to magnetism

Devices that are sensitive to magnets can be damaged and data may be deleted.

- ▶ Do not move the addressing magnet close to devices that are sensitive to magnets or to sensitive data carriers (e.g. bank cards).

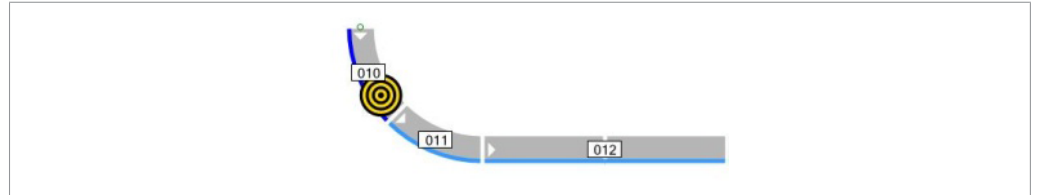
- 
- ▶ To trigger the self-test, hold the addressing magnet for at least one second (but no longer than 3 seconds) in front of the module's contact point.

The self-test can also be triggered when the conveyor is operating. The prerequisite for this is that the zone sensor is not blocked when the self-test is triggered.

## Interroll ConveyorControl

### Initial startup and operation

If the self-test is triggered during the conveying operation and the Configurator is connected to the CentralControl or GatewayControl, the module at which the self-test was started is marked by a circle in the Configurator (except for the *Download* step).



The result of the self-test is displayed by the LEDs:

LED Ready	LED Fault	LED Com	LED Meaning
Flashes 1 Hz	On	Flashes 1 Hz	Self-test activated, 1 sensor connected, 1 sensor unblocked (depending on the sensor logic used, this can also apply to a blocked sensor) - or - Self-test activated, 2 sensors connected, 1 or 2 sensors unblocked (depending on the sensor logic used, this can also apply to blocked sensors)
On	On	Flashes 1 Hz	Self-test activated, 1 sensor connected, 1 sensor blocked (depending on the sensor logic used, this can also apply to an unblocked sensor) - or - Self-test activated, 2 sensors connected, both sensors blocked (depending on the sensor logic used, this can also apply to unblocked sensors)

#### 'Ready' LED for SegmentControl without address

If no address was assigned to a SegmentControl, the 'Ready' LED flashes during the self-test if one or both RollerDrives are controlled. If both RollerDrives are not controlled, the 'Ready' LED is lit.

If only one zone was assigned to the SegmentControl, the 'Ready' LED only flashes since a second sensor is not connected and, therefore, cannot be blocked.

### Operation

#### ⚠ CAUTION

##### Accidental start-up of the RollerDrive

Danger of crushing of limbs and damage to goods

- ▶ Ensure that no persons are in the conveyor's danger areas before switching on the power supply.



## Interroll ConveyorControl

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### Initial startup and operation



If no RollerDrive is turning in the conveyor system, this does not necessarily mean that the conveyor system is switched off.

#### Start

- ▶ Ensure that the ambient conditions are complied with during operation (see *"Technical data"*, page 22).
- ▶ Switch on the power supply.  
When all modules have been parameterized, the conveyor system is initialized (see *"Initialization"*, page 16), then conveying starts.



All power supplies of a conveyor system must be switched on within 10 seconds. When that time is exceeded, the CentralControl or GatewayControl shows a system error (see *"Error signaling for GatewayControl and CentralControl"*, page 76).

#### Stop

Conveying stops in the following cases:

- If the power supply is switched off.
- If a corresponding signal is applied (see *"Possible wiring of the inputs"*, page 85).
- If an error occurs.
- If the global stop signal is activated in the Service menu of the Configurator.



# Maintenance and cleaning

## Warning notices about maintenance and cleaning

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### CAUTION

#### Risk of injuries due to incorrect handling

- ▶ Maintenance work and cleaning must only be performed by qualified and authorized persons.
  - ▶ Perform maintenance work only when the system is powered down. Secure the ConveyorControl system against inadvertent powering up.
  - ▶ Set up signs indicating that maintenance work is in progress.
- 

### Maintenance

#### Checking the ConveyorControl

The ConveyorControl modules themselves are maintenance-free. To prevent faults however, regular inspection of the connections and fastenings is required.

- ▶ As part of the regular control and maintenance work on the conveyor system, ensure that the screws of all ConveyorControl modules are still tight and that the cables are still laid properly and correctly connected to the corresponding terminals.

#### Replacing ConveyorControl modules

If a ConveyorControl module is damaged, it has to be replaced.

- ▶ Install a new module (see "*Decommissioning*", page 83 and see "*Installation of the ConveyorControl modules*", page 51).
- ▶ Address a new module (see "*Addressing a replacement module*", page 68), parameterize it and download parameters (see "*Downloading parameters*", page 69).

A single module can be replaced without having to perform the addressing process and parameter download with the Configurator.

- ▶ Switch off the voltage supply.
- ▶ Install the new module at the position of the module to be replaced.
- ▶ Switch on the voltage supply and wait until the conveyor system has initialized ('Fault' LED of GatewayControl or CentralControl flashes continuously).
- ▶ Initiate the addressing procedure at the replaced module with the addressing magnet. The module is automatically addressed and parameterized. Afterwards, the conveyor system initializes and the conveying process is automatically performed.



The new module must have the default settings before the replacement.



## Interroll ConveyorControl

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### Maintenance and cleaning

#### Cleaning

Dust and dirt in combination with humidity may bridge the electric circuit. In dirty environments periodic cleaning therefore will help to avoid short-circuits that could damage the modules.

---

### **NOTICE**

#### **Risk of damage to the modules due to incorrect cleaning**

- ▶ Do not immerse modules in liquids.
  - ▶ Do not use any cleaning agents.
- 
- ▶ Vacuum away dust and dirt, if necessary.
  - ▶ For more thorough cleaning, disconnect the ConveyorControl system from the power supply, remove the modules (see "*Decommissioning and disposal*", page 83), and wipe them with a damp cloth.

## Troubleshooting

### Meaning of the LEDs

LEDs provide information about the operating state of the system:

- Ready (green)
- Fault (red)
- Com (green)

Status descriptions of the LEDs:

- Off: LED is statically off
- On: LED is statically on
- Flashes 1 Hz: LED flashes at a frequency of 1 Hz; pulse duty factor 1:1
- Flashes 2 Hz: LED flashes at a frequency of 2 Hz; pulse duty factor 1:1
- Flashes rapidly: LED flashes rapidly 1 to 6 times (depending on the error) within 3 seconds for 250 ms each. The error type can be identified by the number of flashes.

**Note:** Flashing rapidly 6 times corresponds to continuous flashing.

- The 'Com' LED signals communication on the CAN bus in every state by flashing rapidly or flickering.

#### GatewayControl and CentralControl

LED Ready	LED Fault	LED Com	Meaning
Generally			
Off	Off	Off	No operating voltage.
Operating states			
Flashes 2 Hz	Off	X	Switching on the operating voltage. Module initializes its own hardware, the internal or external bus.
Flashes 1 Hz	Off	X	Module starts and checks the network. System is not in conveying mode.
On	Off	X	Module successfully switched the system to conveying mode. No error occurred.
Conditions after occurrence of errors			
Flashes 2 Hz	Flashes rapidly 6x	X	An error occurred during the initialization of the internal hardware or while initializing the internal or external bus.
Flashes 2 Hz	Flashes rapidly 2x	X	System is not in conveying mode. System will be started as soon as communication with the PLC has been established.
On	Flashes rapidly*	X	System is in conveying mode. An error occurred.
Off	Flashes rapidly*	X	The system was stopped due to an error.

## Interroll ConveyorControl

### Troubleshooting

\* Number and meaning of the rapid flashes see "Error signaling for GatewayControl and CentralControl", page 76.

#### Error signaling for GatewayControl and CentralControl

Number of rapid flashes	Error	Comment
1	Non-critical error within the ConveyorControl system.	The error was detected by another module (SegmentControl or ComControl), but is also displayed on the CentralControl. The error type must be determined at the corresponding module.
2	No connection to the PLC.	System cannot be started or is stopped. After resolving the error, the system can be restarted.
4	Voltage error at the CentralControl or GatewayControl.	System is stopped due to the voltage error. A system restart must be performed.
6	CentralControl or GatewayControl detected a system error.	System is stopped due to the system error. A system restart must be performed.

#### SegmentControl and ComControl

The meaning of the LEDs is identical for SegmentControl and ComControl. Thus, for improved clarity, these modules are referred to jointly as "module" in the following table.

LED Ready	LED Fault	LED Com	Meaning
Generally			
Off	Off	Off	No operating voltage.
Off	On	Off	Fuse tripped, module is defective.
Off	Off or flashes rapidly*	On	Module is not addressed (see "Error signaling for SegmentControl and ComControl", page 77).
On	Flashes rapidly 6x	Off	Module is addressed, but not parameterized.
On	Off or flashes rapidly*	On	Module is operational.
Flashes 1 Hz	Off or flashes rapidly*	On	Module is operational. RollerDrive is controlled.

## Interroll ConveyorControl

### Troubleshooting

LED Ready	LED Fault	LED Com	Meaning
On	Off or flashes rapidly*	Flashes 2 Hz	Module performs local or global initialization. RollerDrive is not controlled since zone sensor is blocked.
Flashes 1 Hz	Off or flashes rapidly*	Flashes 2 Hz	Module performs local or global initialization. RollerDrive is controlled since zone sensor is unblocked.
Use of the addressing magnet			
Off	On	On	Magnetic contact applied, module is not addressed.
Off	Flashes 1 Hz	Flashes 1 Hz	Magnetic contact applied between 3 and 10 seconds, module receives a temporary address upon removal of addressing magnet.
Flashes 1 Hz	Flashes 1 Hz	Flashes 1 Hz	Module is temporarily addressed (part of the route is not yet fully addressed and the address is not yet permanently saved).
On	On	On	Module has a permanent address, connection to CentralControl/GatewayControl has been established.
On	On	Off	Module has a permanent address, connection to CentralControl/GatewayControl has been lost.
On	On	Flashes 1 Hz	Module does not have a valid address. Magnetic contact applied between 1 and 3 seconds, self-test is activated.
Flashes 1 Hz	On	Flashes 1 Hz	Module has a valid address. Magnetic contact applied between 1 and 3 seconds, self-test is activated.
On	Flashes 1 Hz	Flashes 1 Hz	Module has a valid address, magnetic contact applied between 3 and 10 seconds, regular conveying is performed. If the magnetic contact is applied for longer than 10 seconds, the module is reset to default settings.

\* Number and meaning of the rapid flashes see "Error signaling for SegmentControl and ComControl", page 77.

### Error signaling for SegmentControl and ComControl

Number of rapid flashes	Error	Comment
1	Conveyor logic error: Error was triggered by exceeding TimeOut1 or TimeOut2.	<ul style="list-style-type: none"> <li>• Perform a system restart, or</li> <li>• For TimeOut1: Reset by blocking the downstream zone sensor, or</li> <li>• For TimeOut2: Reset by blocking the zone sensor</li> </ul> <p>Zone performs local initialization and starts conveying.</p>

## Interroll ConveyorControl

### Troubleshooting

Number of rapid flashes	Error	Comment
2	Sensor error signal (when using sensors with low gain indicator).	Clean sensor. Error response and action upon remedying can be parameterized.
3	RollerDrive is not connected properly. RollerDrives outputs error signal.	Connect RollerDrive properly. Remedy error, RollerDrive automatically resets error signal.
	The right output of a SegmentControl for connecting a slave RollerDrive is parameterized, but RollerDrive is not connected.	Change parameterization.
4	Voltage error (voltage at the module is less than 19 V or more than 26 V).	Remedy cause of overvoltage or undervoltage. Error response can be parameterized.
5	Excessive temperature at the corresponding module.	Remedy cause of excess temperature. Error response can be parameterized.
6	System error: <ul style="list-style-type: none"> <li>• deviating operating voltage</li> <li>• Communication error</li> <li>• Module is missing or is not addressed</li> <li>• Module does not have parameters</li> <li>• Termination error</li> <li>• Parameter PB8 is parameterized to system error (GatewayControl)</li> </ul>	Perform a system restart.

#### LED display when using the addressing magnet

Holding time [seconds]	LED status	Reaction
0-1	'Fault' LED lights up	Addressing magnet was held correctly against the contact point. There is no reaction when removed
1-3	'Com' LED flashes	Self-test starts when removed. With addressed and parameterized modules, the self-test can be started if the zone sensor is not blocked. (Further information see "Self-test", page 70)

## Interroll ConveyorControl

### Troubleshooting

Holding time [seconds]	LED status	Reaction
3-10	LEDs 'Com' and 'Fault' flash	<b>Configurator is connected and addressing was started in the "Address" step:</b> The module is issued a temporary address on removal. As long as all modules in the planned addressing are not addressed, all three LEDs flash in parallel. <b>Addressing via the Configurator not started:</b> Com and Fault continue to flash on removal. The LEDs can only be reset with a system restart. There is no addressing.
> 10	Off	<b>Module does not have an address:</b> No reaction <b>Module has an address:</b> After 10 seconds, the module is reset to default settings. Address and parameters are lost.

#### Behavior in case of an error

Errors that occur are divided into 2 categories: Status errors and system errors.

If errors occurred in the system (status errors or system errors), the control can query the current error status of zones or the GatewayControl by querying the error register (ERR) via acyclical accesses.

#### Status error

Status errors are non-critical errors of nodes in the ConveyorControl system. They can potentially limit the operation of the system, but do not cause the system to be switched out of conveying mode. This includes all errors that are not parameterized or defined as system errors for the corresponding node, such as logic errors, sensor errors, or RollerDrive errors.

When status errors occur, the error bit in the zone process data (LSCR) of the corresponding control module is set to signal the presence of an error for this zone. Depending on the control variant (*Full PLC control* or *I/O PLC control*), additional error bits are set in the zone process data (LSCR) of the pertinent zone; these can already specify the error in more detail. In addition, the error bit is set in the global status register of the system (GSCR). This register should represent the starting point when checking for errors since it reflects the summary status of errors in the GRC system.

An additional notification of the master control does not take place. That is, the control must cyclically analyze the status register of the system (GSCR) to determine existing status errors.

#### System error

System errors are critical errors by nodes in the ConveyorControl system, including the GatewayControl itself. This includes all errors that are parameterized or defined as a system error for the corresponding node (e.g. voltage errors, temperature errors, communication errors or similar). These errors cause the system to be switched out of conveying mode to ensure system safety. Acyclical services are still possible if the cause was not a failure of communication with the master control.

## Interroll ConveyorControl

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### Troubleshooting

When system errors occur, the error bit in the zone process data (LSCR) of the corresponding control module is set to signal the presence of an error for this zone. In addition, the error bit is set in the global status register of the system (GSCR). Since system errors are potentially critical errors that could place the system integrity at risk, the system is switched out of conveying mode and stopped. The exchange of cyclical zone process data is no longer possible on the bus. This means the cyclical process data (except for error bits) are invalid, if system errors occur. Acyclical services are still possible if the cause was not a failure of communication with the higher-level control.

When system errors occur at the Profibus or Profinet fieldbus, GatewayControl transmits a diagnostics alarm to the master control. The diagnostics alarm must have been activated earlier during project planning. An acknowledgment of the alarm by the control is not required. The cause of the error that occurred is specified in more detail in the data for the diagnostics alarm. The useful data content of the diagnostics alarm consists of 4 bytes of manufacturer-specific data, identical to the expanded diagnostics, that provide information about the cause of the system error. Once a diagnostics alarm has been reported, it is not reset by the GatewayControl since system errors can be reset only by a voltage reset or a system restart.



## Interroll ConveyorControl

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### Troubleshooting

#### Troubleshooting

ConveyorControl is a complex system. There are many correlations among all system nodes. Naturally, errors can occur in such a system; these result either from the conveying processes or from the interactions between the individual components. When using the CentralControl, not all errors can be shown in detail, and the error location and display location cannot always be related to each other. Improved error diagnostics are possible with a GatewayControl together with a PLC.

For error diagnostics, it is also important that the interrelation with the modules adjacent to the module displaying an error are taken into account.

If troubleshooting or error correction is not successful, please contact Interroll support and have the following information at hand:

- A complete system map with the parameterization data and details of the serial numbers of all modules (ideally the Configurator project file, if it is identical to the conveyor system).
- Details of the LED displays of all modules. The displays of the module where an error is suspected are usually not sufficient. It is also important to describe the CentralControl error display.
- Details of the behavior of the conveyor system before the error occurred (as far as possible), as well as how the module reacts when you attempt to remedy the error. A power reset should be the last step here.

If system errors occur, the cause of the error can be determined with the diagnostics function of the Configurator. To use the Service function, contact Interroll Support.



The diagnostics function is enabled by clicking the "Fault Events On" button. After finishing the diagnostics, the function must be disabled.

## Interroll ConveyorControl

### Troubleshooting

Error	Possible cause	Remedy
The ConveyorControl system is not working or is working incorrectly.	No or insufficient power supply.	<ul style="list-style-type: none"> <li>▶ Ensure that the output voltage of the power supply is within the specified voltage range. Correct voltage supply see "Technical data", page 22. A line that is too long can also cause a voltage drop.</li> <li>▶ Check the connections and correct if necessary.</li> </ul>
	Internal fuse triggered or faulty.	<ul style="list-style-type: none"> <li>▶ Replace the module.</li> </ul>
RollerDrive does not turn.	RollerDrive is not inserted or inserted incorrectly, control module is defective, or RollerDrive is defective,	<ul style="list-style-type: none"> <li>▶ Ensure that the power supply is within the specified voltage range.</li> <li>▶ Check the connections and correct if necessary.</li> <li>▶ Replace the RollerDrive if necessary.</li> </ul>
	Zone sensor is incorrectly parametrized (PNP/NPN or normally open/normally closed) or defective.	<ul style="list-style-type: none"> <li>▶ Check the sensor's settings or replace the sensor if necessary</li> </ul>
Conveyor process is interrupted.	Material is jammed.	<ul style="list-style-type: none"> <li>▶ Remove jammed material.</li> </ul>
	Overheating of the chopper resistor: the application feeds back too much energy or the power supply is too high.	<ul style="list-style-type: none"> <li>▶ Allow it to cool down.</li> <li>▶ Check the application properties and correct if necessary.</li> <li>▶ Check voltage supply and set to 24 V if necessary.</li> </ul>
	Line interruption of bus communication.	<ul style="list-style-type: none"> <li>▶ Check bus communication, e.g. with the Ping function via the Configurator.</li> </ul>
	Modules were addressed in the wrong order.	<ul style="list-style-type: none"> <li>▶ Perform addressing again.</li> </ul>
Material briefly stops at the sensor, although the downstream zone is unblocked.	The sensor signal bounces for longer than the integrated lock time (especially when using light sensors), as a result, there is delayed or double recognition of the material (see "Lock time with bouncing level", page 121).	<ul style="list-style-type: none"> <li>▶ Use photo cells or, if necessary, optimize the position of the light sensor.</li> </ul>
Addressing cannot be performed or can only be performed with problems.	Bus line has no contact or the contact is faulty.	<ul style="list-style-type: none"> <li>▶ Check the bus line and, if necessary, create contact at a new point.</li> </ul>

### Decommissioning and disposal

- ▶ The packaging must be recycled to provide environmental relief.

#### Decommissioning

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#### **⚠ CAUTION**

##### **Risk of injuries due to incorrect handling**

- ▶ Decommissioning may only be performed by qualified and authorized persons.
  - ▶ Decommission the ConveyorControl system only when it is powered down. When doing so, secure the system against inadvertent powering up.
- 
- ▶ Disconnect all cables from the ConveyorControl system modules.
  - ▶ Unscrew the screws that fasten the modules to the conveyor frame.
  - ▶ Remove all modules from the conveyor frame.

#### Disposal

The operating company is responsible for the proper disposal of the modules.

- ▶ In doing so, industry-specific and local provisions must be observed for disposal of the modules and packaging.

### Appendix

#### Accessories

<b>Designation</b>	<b>Reference number</b>
SegmentControl	1004024
ComControl	1004025
CentralControl	1004027
GatewayControl Profibus	1004026
GatewayControl Profinet	1100275
GatewayControl Ethernet/IP	1101732
PowerControl power supply	1004029
Power flat cable (3G3G-FL, 2 x 2.5 mm <sup>2</sup> , black, 25-m sections)	1004030
Bus communication flat cable (3G3G-FL, 2 x 1.5 mm <sup>2</sup> , yellow, 50-m sections)	1004031
Extension cable for RollerDrive EC310 (2 m long)	1004033
Cable bridge	1004028
Terminating resistor	1103892

## Interroll ConveyorControl

### Appendix

#### Possible wiring of the inputs

The function of the inputs 'In1', 'In2' and 'In3' at the ComControl can be parameterized.



The signals must not be activated during global initialization (except for the zone sensor and start sensor). The signals must be active when the power supply to the conveyor system is switched on or they must be activated during conveying (i.e., after initialization).

- The following functions can be set:
- *Not used* (factory setting for 'In2' and 'In3')
- *Zone Sensor* (factory setting for 'In1')
- *Start Sensor*
- *Start D one zone*
- *Start Z one zone*
- *Stop D one zone*
- *Stop D all zones*
- *Stop Z one zone*
- *Stop Z all zones*
- *Clear*
- *Clear reverse*
- *Alternative speed*
- *Conveyor direction*
- *System restart*

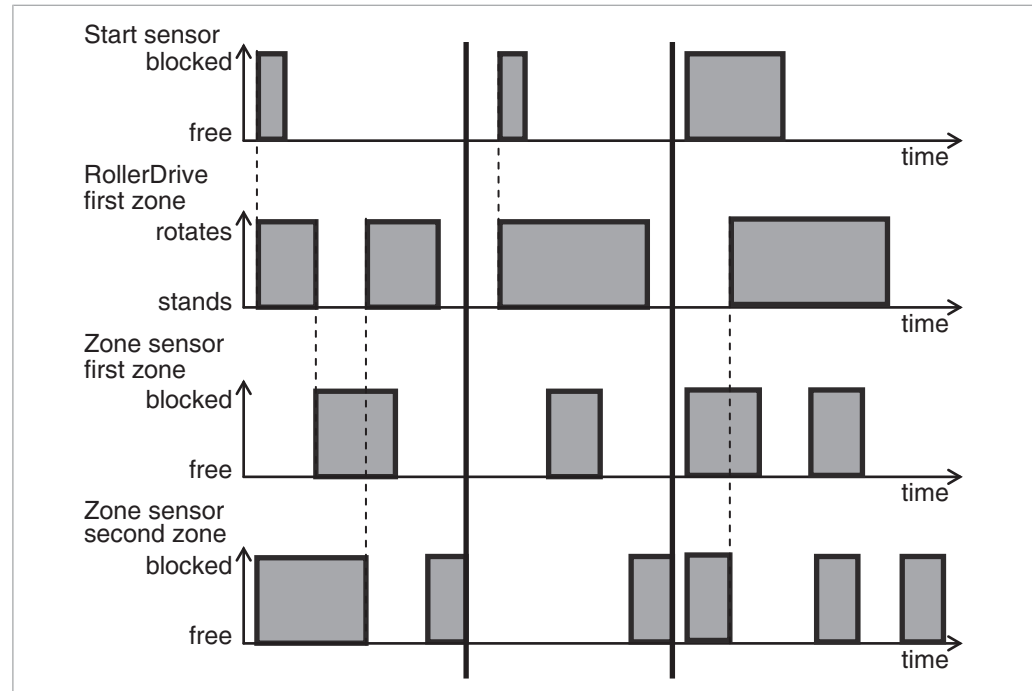
In the case of the functions *Clear*, *Clear reverse*, *System restart*, *Stop D all zones* and *Conveyor direction*, the conveyor system automatically performs a global initialization after deactivation of the signal. In the case of the functions *Start D one zone* and *Stop D one zone*, the conveyor automatically performs a local initialization for the relevant zones after deactivation of the signal (see "*Initialization*", page 16).



If the parameter PZ15 = 0 has been set, there is no local initialization.

<b>Not used</b>	Factory setting of inputs 'In1' and 'In2'. The inputs are not analyzed.
<b>Zone sensor/'In1'</b>	Factory setting for 'In1'.
<b>Start sensor/'In2'</b>	<p>The start sensor is used for communication with an upstream conveyor system. It recognizes when a material is to be accepted and reports this to the ComControl of the first zone. The input 'In2' is not parameterized as a start sensor at the factory.</p> <p>The start sensor is subject to the conveyor logic time checks:</p> <ul style="list-style-type: none"> <li>• If the start sensor is blocked for longer than defined in parameter PZ6 (<i>TimeOut1</i>), the action defined in parameter PZ7 (<i>TimeOut1 Reaction</i>) is triggered.</li> <li>• If the start sensor becomes unblocked after blocking, the time until the zone sensor of the first zone is blocked is measured. If this time exceeds the time defined in parameter PZ8 (<i>TimeOut2</i>), the action defined in parameter PZ9 (<i>TimeOut2 Reaction</i>) is triggered.</li> </ul>

### Appendix



#### Start D one zone

This signal starts the RollerDrive that is connected to the ComControl for which the signal applies. While the signal is active, the zone sensor signal is ignored. The RollerDrive continues to turn as long as the signal is active. For the downstream and upstream zones, the zone for which the signal is active is blocked. Hence, no material is fed in and the downstream zone expects material, even if the zone sensor is not blocked. The *TimeOut1* timer is ignored. Local initialization is performed once the signal is deactivated.



If the parameter  $PZ15 = 0$  has been set, there is no local initialization.

#### Start Z one zone

This signal starts the RollerDrive while taking the principle of zero pressure accumulation conveying into account. The effect of the signal depends on the following factors:

- Zone sensor signal from its own or adjacent zones
- Position of the zone within the conveyor line (start zone, middle zone, end zone)
- Specified conveyor logic (single or train release)

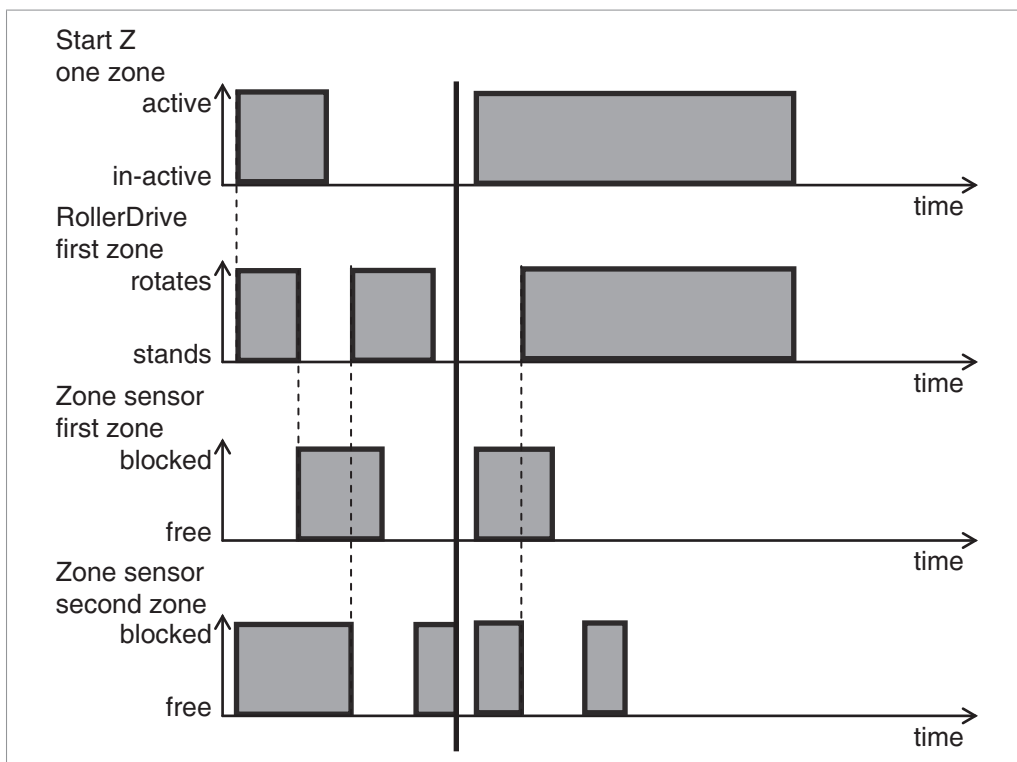
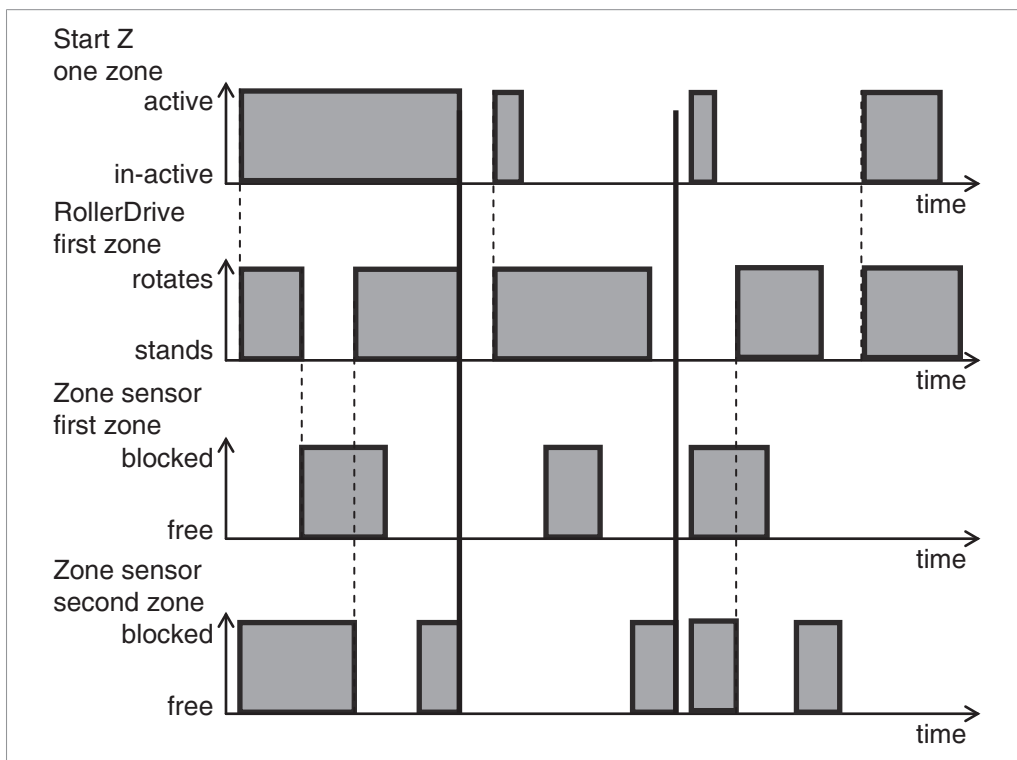
The signal is not monitored by  $PZ6$  (*TimeOut1*) and can be used for the first and last zone of a conveyor line.

# Interroll ConveyorControl

## Appendix

### Single release

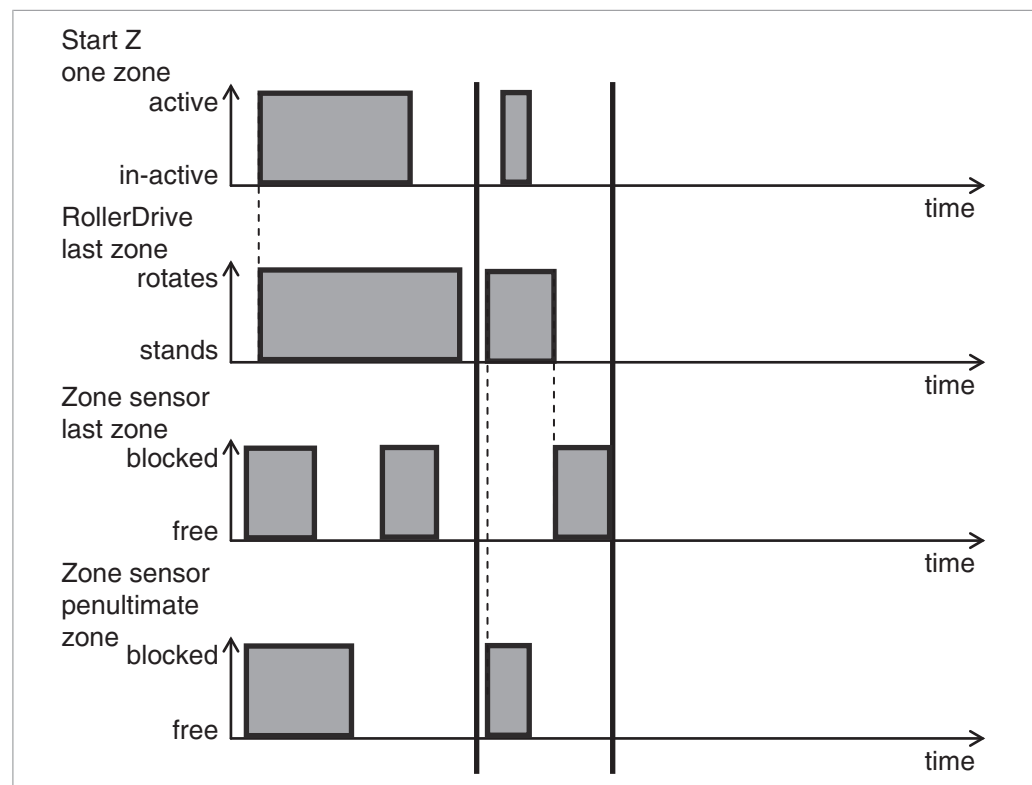
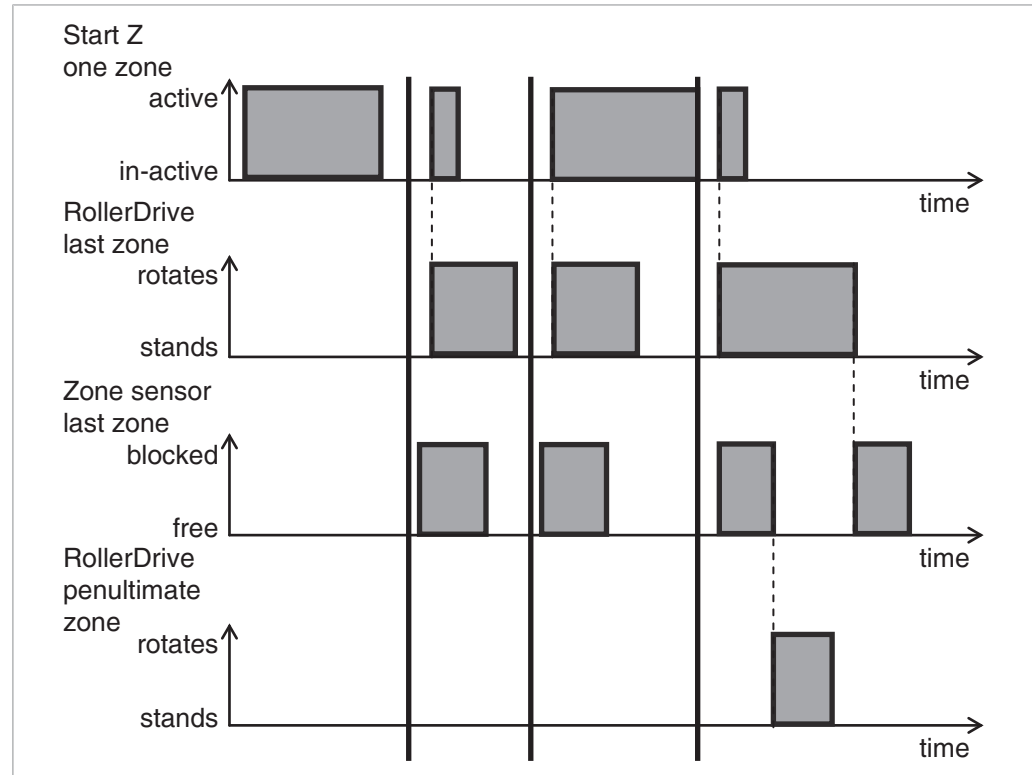
The following diagram shows the functioning of the signal *Start Z one zone* at a start zone:



## Interroll ConveyorControl

### Appendix

The following diagram shows the functioning of the signal *Start Z one zone* at an end zone when single conveyor logic has been set



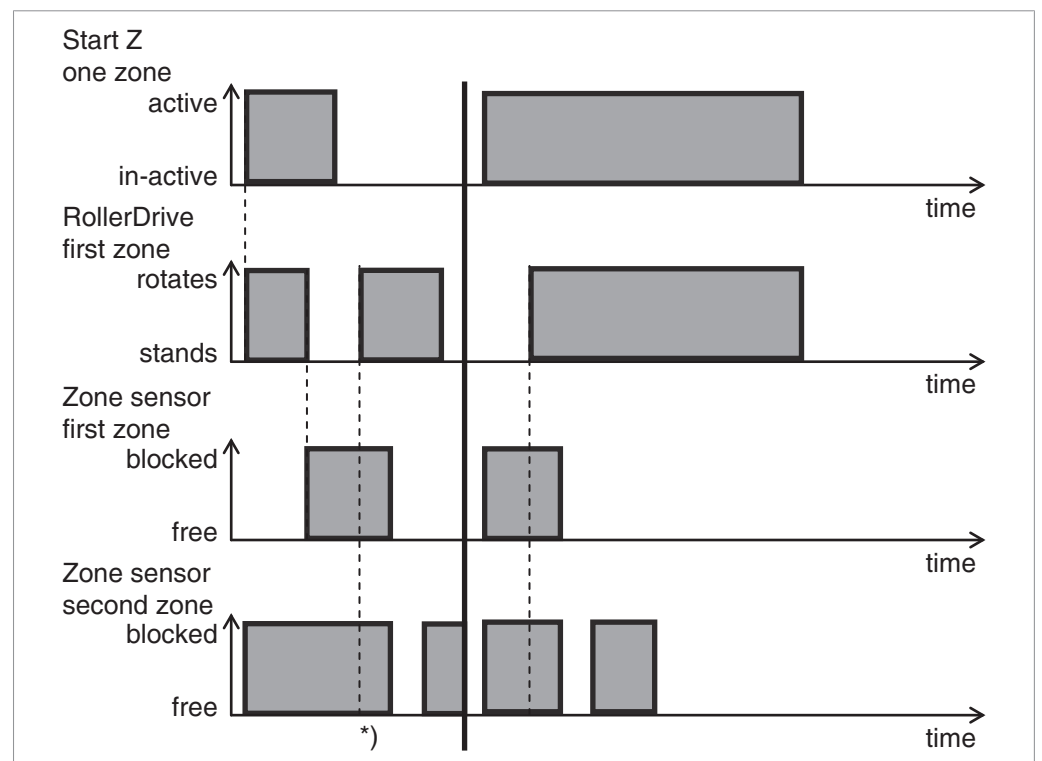
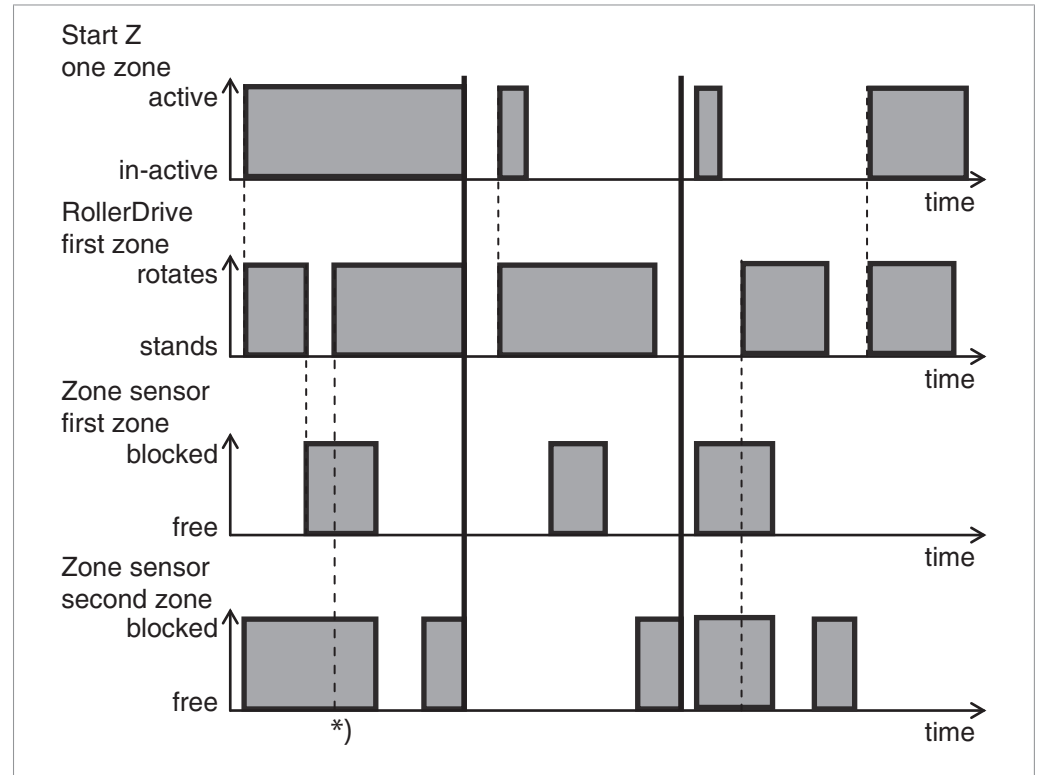


## Interroll ConveyorControl

### Appendix

#### Train release

The following diagram shows the functioning of the *Start Z one zone* signal at a start zone with the setting of the parameter  $PZ12 = 0$  seconds:

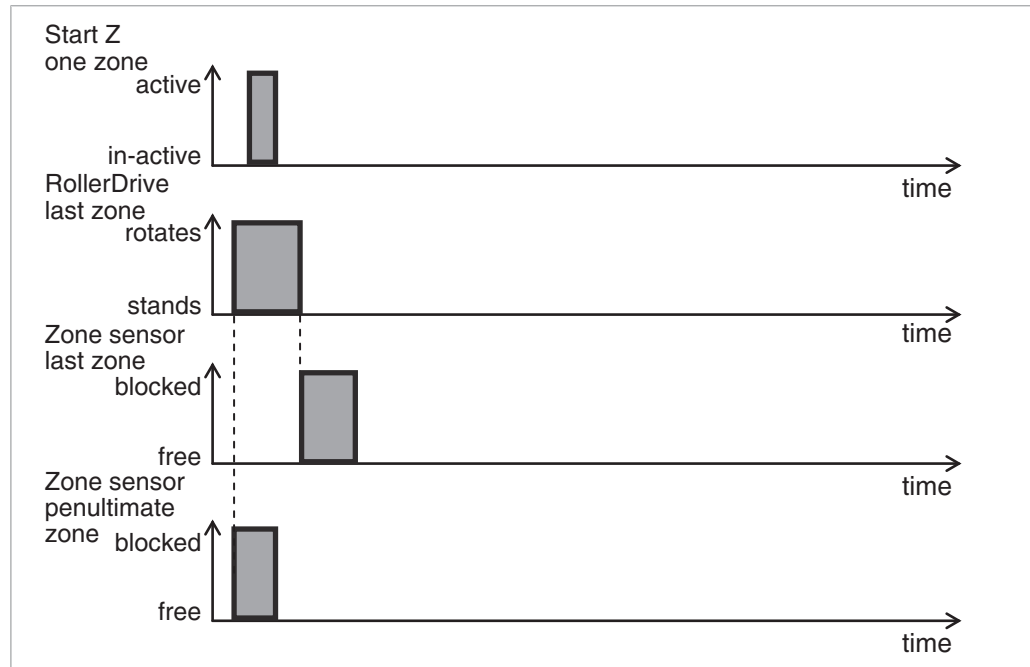
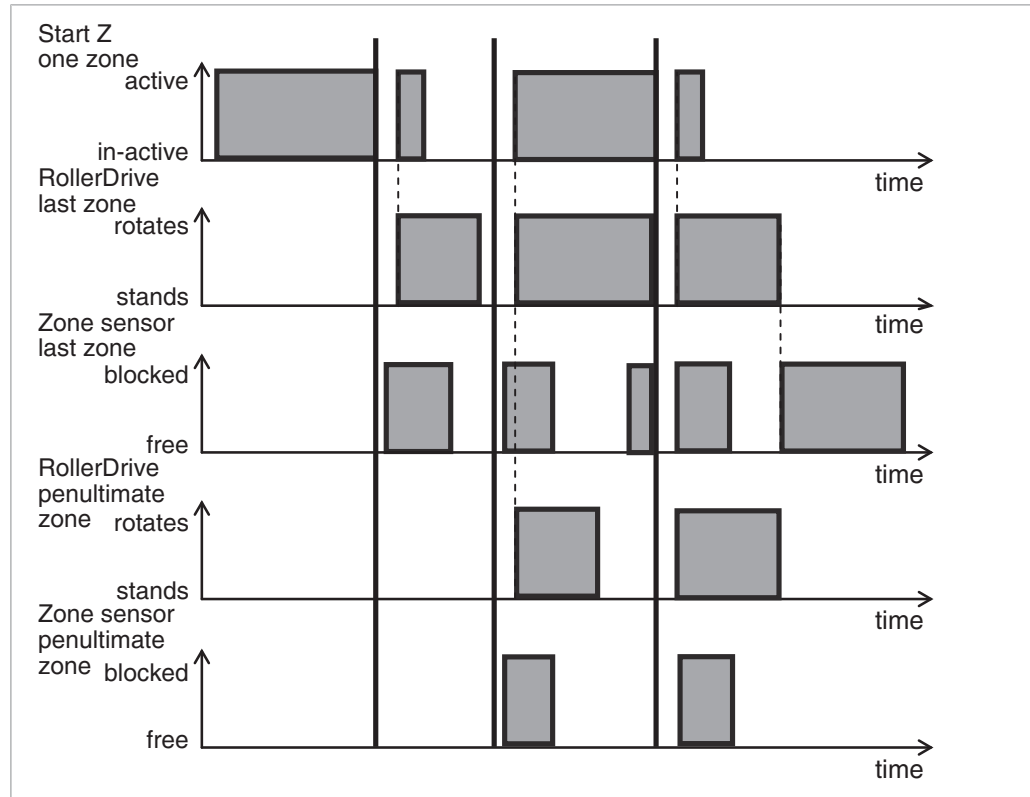


## Interroll ConveyorControl

### Appendix

\* A start signal at zone two or another zone causes all RollerDrives on which material has come to a halt to start again.

The following diagram shows the functioning of the signal *Start Z one zone* at an end zone when block conveyor logic has been set.



## Interroll ConveyorControl

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### Appendix

#### Stop D one zone

This signal stops the corresponding RollerDrive.

- The zone sensor signal is ignored while the signal is active; the RollerDrive stops for as long as the signal is active.
- For an upstream zone, the zone for which the signal is active is blocked. Hence, no material is fed in.
- Local initialization is performed once the signal is deactivated.



If the parameter  $PZ15 = 0$  has been set, there is no local initialization.

#### Stop D all zones

This signal immediately stops all RollerDrives in the conveyor system. This also applies when a local or global initialization is performed. The zone sensor signals are ignored while the signal is active; all RollerDrives stop for as long as the signal is active. If the signal is active while the power supply to the conveyor system is switched on or the step *Download* is performed, there is no global initialization. Global initialization is performed once the signal is deactivated.

#### Stop Z one zone

This signal stops the corresponding RollerDrive (that is connected to the ComControl for which the signal applies) while taking the principle of zero pressure accumulation conveying into account. This means:

- For a downstream zone, the zone for which the signal is active is unblocked for the duration of the signal.
- If the signal is active and the corresponding sensor is unblocked, the next material is transported up to the zone sensor and stops there. This also applies if the downstream zone is or becomes unblocked.
- If the signal is active, the corresponding zone sensor is blocked and the corresponding RollerDrive turns, the material is transported to the downstream zone and the next material is stopped, providing the signal is still active.
- If the signal is active, the corresponding zone sensor is blocked and the corresponding RollerDrive does not already turn, the material is no longer transported. This also applies if the downstream zone is unblocked. The material is not transported again until the signal is deactivated.

If the value of parameter  $PZ13$  (*SensorDelay*) is not zero, this delay also applies here, i.e., the material does not stop at the zone sensor but after the specified delay time.

There is no initialization once the signal is deactivated.

#### Stop Z all zones

This signal stops all RollerDrives in the conveyor system while taking the principle of zero pressure accumulation conveying into account. The function is identical to the signal *Stop Z one zone*, but affects all zones simultaneously. With this signal it is possible to stop conveying in a defined manner. This means that every material stops at a zone sensor and thus comes to a halt precisely within one zone.

- If the signal is active while the power supply to the conveyor system is switched on or the step *Download* is carried out, global initialization is performed as normal.
- After initialization, the conveyor system does not start conveying and, instead, stops.
- If the signal is issued during global initialization, initialization is completed as normal and the system then stops without switching to conveying.

## Interroll ConveyorControl

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### Appendix

- There is no initialization once the signal is deactivated.

**Clear** This signal immediately starts all RollerDrives in the conveyor system. Each RollerDrive turns according to the properties defined for it in parameters PD1 to PD7.

- The zone sensor signal is ignored while the signal is active; the RollerDrives turn for as long as the signal is active.
- This signal serves to immediately empty the conveyor system in the conveyor direction.
- If the signal is active while the power supply to the conveyor system is switched on or the step *Download* is performed, there is no global initialization.
- If the signal is activated during global initialization, global initialization is canceled and the *Clear* signal is executed.
- Global initialization is performed once the signal is deactivated.

**Clear reverse** This signal immediately starts all RollerDrives in the opposite direction. The function is identical to *Clear*, only the setting of the PD3 parameter is inverted (*RDDirection*) and, accordingly, the conveyor system is emptied in the opposite conveyor direction.

**Alternative speed** With this signal the conveying speed can be switched between the value of the PD4 parameter (*MainSpeed*) and the value of the PD5 parameter (*AlternativeSpeed*).

If the signal is not active, each RollerDrive turns at the speed that results from the PD1, PD2 and PD4 settings. If the signal is active, each RollerDrive turns at the speed that results from the PD1, PD2 and PD5 settings. Activation or deactivation of the signal is immediately effective, even if initialization is performed at the same time.

**Conveyor direction** This signal changes the direction of rotation of all RollerDrives in the conveyor system and the logical conveyor direction. Various preparations must be made before this signal can be activated.

One of the principles of zero pressure accumulation conveying is that there is only one material in each zone and that the material does not project into the adjacent zones (see "*Zero pressure accumulation conveying*", page 15). In order to achieve this, a zone sensor is positioned at the end of each zone. If only the conveyor direction were to be reversed, the zone sensors would be at the start of each zone and, thus, the material would always project into the upstream zone.

To avoid this, the following changes must be made to the conveyor system if a change in the conveyor direction is planned:

- All zone sensors in the conveyor system must be positioned in the center of the corresponding zone.
- Using the parameter PZ13 (*SensorDelay*) a sensor signal delay must be set. This delay means that a package does not stop when the sensor is reached but after the specified delayed time. The delay is calculated based on half the length of the longest material and the speed of conveying. It should be set so that the entire length of each material comes to a halt within one zone. We recommend determining the delay time by using empirical tests.

Thanks to these measures, conveying is possible in both directions without material partially stopping in a second zone and, in the process, remaining within the zone sensor.

## Interroll ConveyorControl

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### Appendix

If the signal is activated or deactivated, initialization in the corresponding direction is performed. If the signal is activated during initialization, initialization is stopped immediately and initialization in the new conveyor direction is performed.

If the signal is activated while another signal that affects the entire conveyor system (e.g. *Clear*) is activated, the conveyor direction is not changed until the other signal has been deactivated.



The conveyor direction can only be reversed if all material is roughly the same length. The shortest material must be more than half the length of the longest material. If the shortest material is shorter than this, it is transported out of the detection area of the centrally located sensor during the delay period.

#### System restart

The signal restarts the conveyor system, and a global initialization is performed. The system restart can be used, e.g. to reset a system error.

#### Prioritizing of signals

If several signals are activated simultaneously, they are carried out according to their priority.

- A higher priority signal can override a lower priority signal.
- A lower priority signal cannot override a higher priority signal.
- If a higher priority signal is deactivated and a lower priority signal is still active, the function of the lower priority signal is carried out once the higher priority signal has been deactivated.
- Equal signals switched on at different points are linked with OR.
- The *AlternativeSpeed* signal is always immediately implemented.

The following signals are of high priority:

- *Stop D one zone*
- *Stop D all zones*

The following signals are of medium priority:

- *Clear*
- *Clear reverse*

The following signals are of low priority:

- *Stop Z one zone*
- *Stop Z all zones*
- *Conveyor direction*

## Interroll ConveyorControl

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### Appendix

#### Possible wiring of the ComControl outputs

The function of the outputs 'Out1', 'Out2', and 'Relay' at the ComControl can be changed or adjusted as needed. The function of each output can be selected from a predefined list:

- *Not used*
- *Error signal*
- *Aux RD start*
- *Zone status*
- *Sensor signal*
- *Input signal 2*
- *Input signal 3*

**Not used** The default setting of every output is *Not used*. This means that the output is not active.



An output parameterized to *normally closed* will output 24 V when *Not used* is set.

**Error signal** Errors in the conveyor system can be indicated at an output with this setting. The signal does not indicate the type of error, only that there is an error. If an output is parameterized as an error output, it always provides the error information of the entire conveyor system. Sub-areas for the error signal cannot be created.

**Aux RD start** If a second RollerDrive in a zone is to be controlled via a ComControl, an output with this setting must be parameterized. The signal at this output is activated simultaneously with the start signal of the first RollerDrive. This output should then be connected to one of the speed inputs of an Interroll DriveControl 20/54. Only the start signal of the second RollerDrive can then be controlled via the ConveyorControl system. All other functions are not available. This means that the speed and direction of rotation must be set using the dip switches of the DriveControl 20/54 and cannot be changed by the ConveyorControl system. Functions, such as switching the conveyor direction or switching to a second speed, can then not be used. Furthermore, possible RollerDrive errors will only be displayed by the DriveControl 20/54, and not by the ConveyorControl system.

For these reasons, it is better to connect a slave RollerDrive to a SegmentControl since this offers more options.

**ZoneStatus** The *Zone Status* signal can be used for a handshake with external systems. The zone status reacts depending on the position of the zone (start, middle or end zone) and the conveyor logic set. If there is an error, the zone status issues a 'Low' signal. During global or local initialization, the zone status is 'Low'.

Single release:

As a rule, the zone status is always 'High' when the zone sensor is blocked.

- Start zone:
  - The zone status is 'High' once a material has left the start sensor or the *Start Zone* zone signal is deactivated again. The zone status changes to 'Low' once the zone sensor is no longer blocked.

## Interroll ConveyorControl

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### Appendix

- Middle zone:
  - The zone status is 'High' once a material has reached the zone sensor. The zone status changes to 'Low' once the zone sensor is no longer blocked.
- End zone:
  - The zone status is 'High' once a material has reached the zone sensor of the last zone. A material can be conveyed out of the last zone via the signal *Start Zone zone*. If in this case the material is conveyed out, the zone sensor changes to 'Low' once the material has left the zone sensor.
- In general:
  - If the signal *Start D, Clear* or *Clear reverse* is activated, the zone status is 'High'. If the signal is deactivated again, the zone status changes back to 'Low'. This applies to all zones (start, middle and end zone). A material has stopped. It is removed manually, the zone sensor becomes unblocked. The zone status changes to 'Low' in the start zone after the *PermissionDelay* expires, in a middle or end zone once the zone sensor changes to unblocked.

#### Train release:

- Start zone:
  - The zone status is 'High' once a material has left the start sensor or the *Start Zone zone* signal is deactivated again. The zone status remains 'High' when the material stops. If the zone sensor in the downstream zone changes to unblocked, the zone status changes to 'Low' after the time set in PZ12 expires. If the downstream zone is unblocked, the zone status changes to 'Low' once the material has reached the zone sensor (and not on leaving the zone sensor).
- Middle zone:
  - The zone status changes to 'High' once a material blocks the zone sensor. The zone status changes back to 'Low' once the material has left the zone sensor. The zone status remains 'High' when the material stops. If the sensor in the downstream zone changes to unblocked, the zone status changes to 'Low' after the time set in PZ12 expires.
- End zone:
  - The zone status changes to 'High' once a material blocks the zone sensor. Without a start signal, the zone status remains 'High' since the material in the last zone comes to a halt. On activation of the signal *Start Zone zone* the material is transported out of the end zone. The zone status changes to 'Low' once the material has left the zone sensor (the time set in PZ12 is not taken into account).

## Interroll ConveyorControl

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### Appendix

#### Sensor signal

An output with this setting copies the signal of the zone sensor that is connected to the ComControl. This allows it to be analyzed for other functions.



If a delay has been set for the sensor signal with PZ13 and the zone sensor signal is parameterized for an output, the switch delay is added to the sensor delay.

#### Input signal 2, input signal 3

An output with this setting copies the signal that was given at the corresponding input.



## Interroll ConveyorControl

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### Appendix

#### Glossary of parameters

- PB1** *BusType*: A GatewayControl was selected via the *Construct* step. PB1 designates the fieldbus selected in that step. The parameter value cannot be changed.
- PB2** *BusBitrate*: Transfer speed of Profibus (Profibus only).  
Default is *Autodetect*.
- PB3** *BusAddress*: The GatewayControl is a Profibus node. The Profibus node address intended for the GatewayControl Profibus must be entered here.  
Default is 5.
- PB4** *HostName*: Name of the GatewayControl in the network (Profinet, EtherNet/IP).  
Default is *gateway*.  
This name must match the name specified in the PLC.
- PB5** *IPAddress*: Internet protocol address of the GatewayControl in the network (Profinet, EtherNet/IP).  
Default is 0.0.0.0.
- PB6** *SubnetMask*: Definition of the relevant bits for the network prefix of the Internet protocol address (Profinet, EtherNet/IP).  
Default is 0.0.0.0.
- PB7** *BroadcastAddress*: Broadcast address of the GatewayControl in the Internet protocol subnet (Profinet, EtherNet/IP).  
Default is 0.0.0.0.
- PB8** *BusErrorResponse*: Response of the system in case of transmission interruptions on the fieldbus or faults in the PLC (Profibus, Profinet, EtherNet/IP).
- *LED display*: Conveyor remains in operating state. The error is indicated via the 'Fault' LED. The LED error display is automatically reset once the error has been remedied.
  - *System stops*: Conveyor is stopped. The error is indicated via the 'Fault' LED. The LED error display is automatically reset and the system automatically returns to operation once the error has been remedied.
  - *System error*: The conveyor system is stopped and changes to the *System error* state. The error is indicated via the 'Fault' LED. The system error can be reset only via voltage reset or restart.
- Default is *System stops*.
- PB10** *DomainName*: Domain name of the GatewayControl in the Internet Domain Name System (DNS) (EtherNet/IP only).  
Default: ""
- PB11** *DNS ServerAddress*: IP address of the primary DNS server responsible for name resolution (EtherNet/IP only).

## Interroll ConveyorControl

---

### Appendix

Default is 0.0.0.0

**PB12** *DNS ServerAddress2*: IP address of the alternate DNS server responsible for name resolution (EtherNet/IP only).

Default is 0.0.0.0

**PB13** *NetworkConfigMode*: Procedure for the network settings (EtherNet/IP only).

- *Static*: Settings are performed via the Configurator (PB4, PB5, PB6, PB7, PB10, PB11, PB12)
- *BOOTP*: Settings are performed via network using a BOOTP server (PB4, PB5, PB6, PB7, PB10, PB11, PB12)
- *DHCP*: Settings are performed via network using a DHCP server (PB4, PB5, PB6, PB7, PB10, PB11, PB12)

Default is *DHCP*

**PB14** *Port setting*: Operating mode and transfer speed of the Ethernet port (EtherNet/IP only).

- *HalfDuplex 10 Mbps*: Half duplex transmission at 10 Megabit per second
- *FullDuplex 10 Mbps*: Full duplex transmission at 10 Megabit per second
- *HalfDuplex 100 Mbps*: Half duplex transmission at 100 Megabit per second
- *FullDuplex 100 Mbps*: Full duplex transmission at 100 Megabit per second
- *Auto*: Automatic configuration of Ethernet port

Default is *Auto*

**PD1** *GearRatio*: With PD1, the gear ratio of the RollerDrive can be selected from a list for the selected zones. The default setting is 12:1. This parameter is subject to a plausibility check (see "*Parameterizing modules*", page 40).

**PD2** *RDDiameter*: With PD2, the diameter of the RollerDrive can be defined for the selected zones. Diameters from 50 to 80 mm can be set. The default setting is 50 mm. This parameter is subject to a plausibility check (see "*Parameterizing modules*", page 40).

**PD3** *RDDirection*: With PD3, the direction of rotation of the RollerDrive can be defined for the selected zones. The default setting is clockwise.

**PD4** *MainSpeed*: With PD4, the speed of the RollerDrive can be defined for the selected zones. The speed can be set between the minimum and maximum limits up to an accuracy of 2 decimal points. The default setting is 1.3 m/s. This parameter is subject to a plausibility check (see "*Parameterizing modules*", page 40).

**PD5** *AlternativeSpeed*: With PD5, an alternative speed for the RollerDrive can be defined for the selected zones. The speed can be set between the minimum and maximum limits up to an accuracy of 2 decimal points. The default setting is 1.3 m/s. This speed can be activated via a corresponding signal on a ComControl in the conveyor system (see "*Alternative speed*", page 92). The signal affects all connected RollerDrives. This parameter is subject to a plausibility check (see "*Parameterizing modules*", page 40).

## Interroll ConveyorControl

### Appendix

- PD6** *RDAcceleration:* With PD6, the acceleration of the RollerDrives can be affected for the selected zones. The highest acceleration possible for the RollerDrive is achieved by entering the value 20. The actual acceleration results from the application properties. By entering a lower value, the acceleration of the RollerDrive can be adjusted to the application.
- PD7** *RDDeceleration:* With PD7, the deceleration of the RollerDrives can be influenced for the selected zones. The highest deceleration possible for the RollerDrive is achieved by entering the value 20. The actual deceleration results from the application properties. By entering a lower value, the deceleration of the RollerDrive can be adjusted to the application.

PD6/PD7 setting value	Acceleration/deceleration ramp [s]
1	4.83
2	3.86
3	3.38
4	2.90
5	2.41
6	1.93
7	1.61
8	1.45
9	1.10
10	0.97
11	0.83
12	0.72
13	0.55
14	0.48
15	0.39
16	0.32
17	0.28
18	0.24
19	0.19
20	0.01

- PG1** **ControlMode:** Operating mode of the ConveyorControl system's control (Profibus, Profinet, EtherNet/IP).
- *I/O PLC control:* The conveyor process is controlled decentralized in the ConveyorControl modules. The PLC can monitor errors and the conveying process, and affect it by setting global or zone-based control signals (signals correspond to the selection in PIN4)
  - *Full PLC control:* The process is controlled exclusively via PLC; for this purpose, the PLC receives the status messages of sensors and RollerDrives. The ConveyorControl modules serve only as decentralized I/O modules.

## Interroll ConveyorControl

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### Appendix

Mixing control modes is possible. To do so, the corresponding mode must be set in the SegmentControls and ComControls. Default is *I/O PLC control*.

- PIN1** *LogicType*: With PIN1, the switching level can be specified for the selected zones. With PNP, a high signal is detected when reaching 24 V. With NPN, a high signal is detected when reaching ground. PIN1 is available on the tabs *Sensor* (for SegmentControl), as well as *In1*, *In2* and *In3* (for ComControl). The default setting is PNP.
- PIN2** *SwitchType*: The logic type can be specified for the selected zones with PIN2. With the setting *normally closed* a switch is assumed to be an opener. With the setting *normally open* a switch is assumed to be a closer. PIN2 is available on the tabs *Sensor* (for SegmentControl), as well as *In1*, *In2* and *In3* (for ComControl). The default setting is *normally open*.
- Example for the signal *Stop1 all zones*: If a ComControl input is parameterized with this signal, PNP and *normally open*, a 24-V signal at the input of the ComControl causes all connected RollerDrives in the conveyor system to stop.
- PIN3** *LowgainInput*: With PIN3, you specify for the selected zones whether the sensor connected to the input has a low gain indicator. The signal logic is based on the sensor logic (see setting in PIN1 and PIN2). If a sensor issues the low gain signal, it is recognized as an error and a corresponding measure is taken. PIN3 can be selected for the sensor inputs of the SegmentControl, and for *In1* and *In2* of the ComControl. *In3* cannot handle low gain. The default setting is *Without*, i.e., there is no assessment of contamination. The designation on the sensors is often "Low Gain".
- PIN4** *Function*: The function of the corresponding input can be specified for the selected zones with PIN4 (see "*Possible wiring of the inputs*", page 85). The default setting is *Not used*, i.e. no input function.
- POUT1** *LogicType*: POUT1 cannot be set, but is parameterized permanently to the value PNP. This parameter is available with outputs *Out1* and *Out2*.
- POUT2** *SwitchType*: The logic type can be specified for the selected zones with POUT2. With the setting *normally closed* a switch is assumed to be an opener. With the setting *normally open* a switch is assumed to be a closer. POUT2 is available on the tabs of the three outputs. The default setting is *normally open*.
- Example for the signal *Error output*: An output of a ComControl is parameterized as *Error signal* and *normally closed*. If no error occurred, the output is 24V; if an error occurs, the output switches to ground potential.
- POUT3** *Function*: The function of the corresponding output can be specified for the selected zones with POUT3 (see "*Possible wiring of the ComControl outputs*", page 94). The default setting is *Not used*, i.e. no output function.
- POUT4** *SignalDelay*: A delay of the corresponding output signal can be parameterized for the selected zones with POUT4. The maximum delay that can be set is 10 seconds. POUT4 is available on the tabs of the three outputs. The default setting is 0 seconds.

## Interroll ConveyorControl

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### Appendix

- PZ2** *UpStreamAdr*: If only one zone has been selected, PZ2 shows the following information of the selected zone's upstream zone:
- Module type (CC for ComControl and SC for SegmentControl)
  - The number assigned to the module in the *Construct* step.
  - In the case of a SegmentControl: whether the reference is to the left or right zone of the SegmentControl
- When either several zones or the first zone of a conveyor line are selected, nothing is displayed. PZ2 cannot be set and can only be read out.
- PZ3** *DownStreamAdr*: If only one zone has been selected, PZ3 shows the following information of the selected zone's downstream zone:
- Module type (CC for ComControl and SC for SegmentControl)
  - The number assigned to the module in the *Construct* step.
  - In the case of a SegmentControl: whether the reference is to the left or right zone of the SegmentControl
- When either several zones or the first zone of a conveyor line are selected, nothing is displayed. PZ3 cannot be set and can only be read out.
- PZ4** *AdrSlaveRD*: In some applications, the use of a second RollerDrive (slave RollerDrive) within a zone is necessary. PZ4 can be used to parameterize the SegmentControl or ComControl that is to control the slave RollerDrive.
- In the simplest case, the master RollerDrive is controlled by a SegmentControl that controls just one zone. In this case, the slave RollerDrive can be connected to the right side of the SegmentControl. In this case, the module that controls the zone is the same as the module to which the slave RollerDrive is connected. It is also possible that the control of the slave RollerDrive is handled by a module to which the slave RollerDrive is not directly connected. PZ4 can be used to parameterize the module to which the slave RollerDrive is connected.
- This parameter can be set for a SegmentControl or a ComControl. The numbers of all SegmentControls in the conveyor system that control just one zone are shown in a list and the relevant SegmentControl can be selected. If no SegmentControls that control just one zone are used, the selection list includes only the value *None*. The default setting is *No Slave RD*.
- PZ5** *Conveyor logic*: With PZ5, the conveyor logic can be specified for the selected zones, i.e., whether zero pressure accumulation conveying will be performed with *Single release* or with *Train release* (see "*Zero pressure accumulation conveying*", page 15). Train release should only be selected if a very high material throughput is necessary. Zones with differing Conveyor logic can be parameterized within one conveyor system. The default setting is *Single release*.
- PZ6** *TimeOut1*: With PZ6, the time can be specified after which a *TimeOut1* error should occur if a zone sensor does not become unblocked even though the RollerDrive is running. If the RollerDrive is started to transport a material, the *TimeOut1* time is also started. If the material is unable to leave the sensor within the time defined by PZ6, a *TimeOut1* error occurs. This, for example, allows jammed material to be detected. If PZ6 is set to zero, the time is not monitored. A maximum of 25 seconds can be set, the default setting is 5 seconds.

### Appendix

- PZ7** *TimeOut1 Reaction:* With PZ7, you specify for the selected zones what should happen when a *TimeOut1* error occurs.
- If *Ignore error* is selected, nothing happens after *TimeOut1* expires. The RollerDrive will continue to turn for as long as the zone sensor is blocked.
  - If *Zone stop + LED flashing* is selected, the error is displayed via the 'Fault' LED on the corresponding module, an error is issued via an output on a ComControl and the RollerDrive in that zone is stopped. The error can be reset by a power reset or by blocking the zone sensor of the downstream zone. After remedying the error, local initialization is performed in the downstream zone.
- The default setting is *Zone stop + LED flashing*.
- PZ8** *TimeOut2:* With PZ8, the time that can elapse between the upstream zone sensor becoming unblocked and the current zone sensor becoming blocked can be specified for the selected zones. When the material has left the upstream zone (i.e., the upstream zone sensor is unblocked), the *TimeOut2* time is started. If the material is unable to reach its zone sensor within the time defined by PZ8, a *TimeOut2* error occurs. This, for example, allows material that was dropped, became stuck or has been removed manually to be detected. If PZ8 is set to zero, the time is not monitored. In this case, if the material is removed manually, the RollerDrive would continue to turn until the corresponding zone sensor is blocked (e.g. by the next material). A maximum of 25 seconds can be set, the default setting is 5 seconds.
- PZ9** *TimeOut2 Reaction:* With PZ9, you specify for the selected zones what should happen when a *TimeOut2* error occurs.
- If *Ignore error* is selected, nothing happens after *TimeOut2* expires. The RollerDrive will continue to turn until another material blocks the zone sensor.
  - If *Zone stop + LED flashing* is selected, the error is displayed via the 'Fault' LED on the corresponding module, an error is issued via an output parameterized accordingly on a ComControl and the RollerDrive in that zone is stopped. The error can be remedied by a power reset or by blocking the zone sensor.
  - If *Zone unblocked* is selected, the RollerDrive will switch off after *TimeOut2* expires if there is no further material. The system thus accepts that material has been removed.
  - In principle, remedying the error is also possible with local initialization, e.g. after *Stop D one zone*.
- The default setting is *Zone unblocked*.
- PZ10** *AfterRunTime:* With PZ10, you specify for the selected zones how long the RollerDrive should continue to turn if there is no further material. The RollerDrive does not switch off until this time has passed. This function prevents unnecessary start/stop operation if there are small gaps between the material, but also saves energy by switching off if there is no material to be transported. If PZ10 is set to zero, the RollerDrive switches off immediately when the zone sensor becomes unblocked. The default setting is 4 seconds.
- PZ11** *PermissionDelay:* With PZ11, you specify for the selected zones when a zone is to be deemed 'unblocked' if a material halted in it is removed manually. If several materials came to a halt, and one is removed manually, the material from the upstream zone takes its place. This process can

## Interroll ConveyorControl

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### Appendix

be delayed by using PZ11. This, for example, enables operators to remove a material without another material immediately taking its place. A maximum of 25 seconds can be set, the default setting is 2 seconds.

- PZ12** *TrainReleaseDelay*: With PZ12, the delay time between the start of the individual RollerDrives in train release mode can be specified. With train release, all material is conveyed simultaneously after clearance. On starting, every RollerDrive produces a power peak. Thus, when all RollerDrives are started simultaneously, a high overall power demand arises, and the power supplies used must provide the correspondingly high output. To reduce the power supply output, we recommend that you slightly delay the start of the individual RollerDrives. With PZ12, this delay can be set between 0 and 25 seconds. With a delay of zero, all RollerDrives start simultaneously. The default setting is 0.2 s.
- PZ13** *SensorDelay*: With PZ13, you specify for the selected zones that the zone sensor signals are delayed. This, for example, if the zone sensor is positioned in the middle of the zone for conveyor systems that can convey in both directions (see "Conveyor direction", page 92). The delay means that material is started and stopped later. A maximum of 25 seconds can be set, the default setting is 0 seconds.
- PZ14** *GlobalInitTime*: The duration of global initialization can be specified for the selected zones with PZ14 (see "Initialization", page 16). The time should be set in such a way that during this period a material can be transported from the start of a zone to its end; it is thus based on the length of the zone and the conveying speed. If PZ14 is set to zero, there is no initialization and the conveyor system thus immediately starts conveying. Initialization prevents material that has come to a halt between two sensors due to a loss of power from colliding with other material. A maximum of 25 seconds can be set, the default setting is 4 seconds.
- PZ15** *LocalInitTime*: The duration of local initialization can be specified for the selected zones with PZ15 (see "Initialization", page 16). The time should be set in such a way that during this period a material can be transported from the start of a zone to its end; it is thus based on the length of the zone and the conveying speed. If PZ15 is set to zero, no initialization occurs. A maximum of 25 seconds can be set, the default setting is 4 seconds.
- PZ16** *RDErrorMode*: With PZ16, you specify for the selected zones what should happen when a RollerDrive error occurs.
- If *Ignore error* is selected, the error is identified by the corresponding module, but it is neither shown nor output, and conveying is not stopped. There is a high probability of a collision of materials and possibly conveyor logic errors.
  - If *LED flashing* is selected, the error is displayed by the 'Fault' LED on the corresponding module and is output via a correspondingly parameterized ComControl output. Conveying is not stopped. After canceling this error, there is no local initialization, even if initialization has been selected in PZ17.
  - If *Zone stop + LED flashing* is selected, the error is displayed by the 'Fault' LED on the corresponding module, an error is issued via an output parameterized accordingly on a ComControl, and the RollerDrive in that zone is stopped. The error can only be reset by inserting the RollerDrive correctly or by resetting the error signal of the RollerDrive.

## Interroll ConveyorControl

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### Appendix

Interrupting conveying means that regardless of the zone sensor signal, no further material will be transported either into or out of the zone. The rest of the conveyor system continues to function.

The default setting is *Zone stop + LED flashing*.

**PZ17** *RDErrorRecovery*: With PZ17, you specify for the selected zones whether (*Local Init*) or not (*No Init*) local initialization is performed after a RollerDrive error is remedied. The default setting is *Local Init*.

If PZ15 = 0 has been set, there is no local initialization.

**PZ18** *SensorErrorMode*: With PZ18, you specify for the selected zones how the module should respond if the connected sensor reports low gain, that is the low gain signal becomes active.

- If *Ignore error* is selected, the error is identified by the corresponding module, but it is neither shown nor output, and conveying is not stopped. It is highly likely that the error will be subsequently detected by a logic error. Material may collide.
- If *LED flashing* is selected, the error is displayed by the 'Fault' LED on the corresponding module and output via a correspondingly parameterized ComControl output. Conveying is not stopped. After remedying this error there is no local initialization, even if initialization has been selected in PZ19.
- If *Zone stop + LED flashing* is selected, the error is displayed via the 'Fault' LED on the corresponding module, an error is issued via an output parameterized accordingly on a ComControl, and the RollerDrive in that zone is stopped. The error can only be reset by resetting the low gain signal of the corresponding sensor. The sensor must be cleaned for this. Interrupting conveying means that regardless of the zone sensor signal, no further material will be transported either into or out of the zone. The rest of the conveyor system continues to function. After remedying this error, local initialization occurs, depending on the PZ19 setting.

The default setting is *Zone stop + LED flashing*.

If PZ15 = 0 has been set, there is no local initialization.

**PZ19** *SensorErrorRecovery*: With PZ19, you specify for the selected zones whether (*Local Init*) or not (*No Init*) local initialization is performed on deactivation of a sensor low gain signal. The default setting is *No Init*.

If PZ15 = 0 has been set, there is no local initialization.

**PZ20** *TemperatureRecovery*: With PZ20, you specify for the selected zones how the module is to respond after remedying a temperature error (see "*Temperature protection*", page 16).

- If *No Init* is selected, the system starts to convey again immediately.
- If *Local Init* is selected, the corresponding zone performs a local initialization (see "*Initialization*", page 16) and then conveying is resumed.
- If *Power reset required* is selected, conveying does not resume until the power has been reset.

The default setting is *Power reset required*.

If PZ15 = 0 has been set, there is no local initialization.



## Interroll ConveyorControl

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### Appendix

- PZ21** *PowerErrorMode*: With PZ21, you specify for the selected zones how the module responds after a power error. A power error is output if a module registers a voltage outside of the 19 – 26 V range.
- If *Ignore error* is selected, the error is identified by the corresponding module, but it is neither shown nor output, and conveying is not stopped.
  - If *LED flashing* is selected, the error is displayed by the 'Fault' LED on the corresponding module and, if previously configured, output via a ComControl output. Conveying is not stopped. To reset the 'Fault' LED, a voltage reset or restart (Configurator, input of ComControl, GSCR via PLC) is required.
  - If *System fault* is selected, the error is displayed by the 'Fault' LED on the corresponding module and, if previously configured, output via a ComControl output. The entire conveyor system is stopped. To reset the 'Fault' LED and restart the system, the error must be remedied, and then a voltage reset or restart must be performed.

The default setting is *System error*.

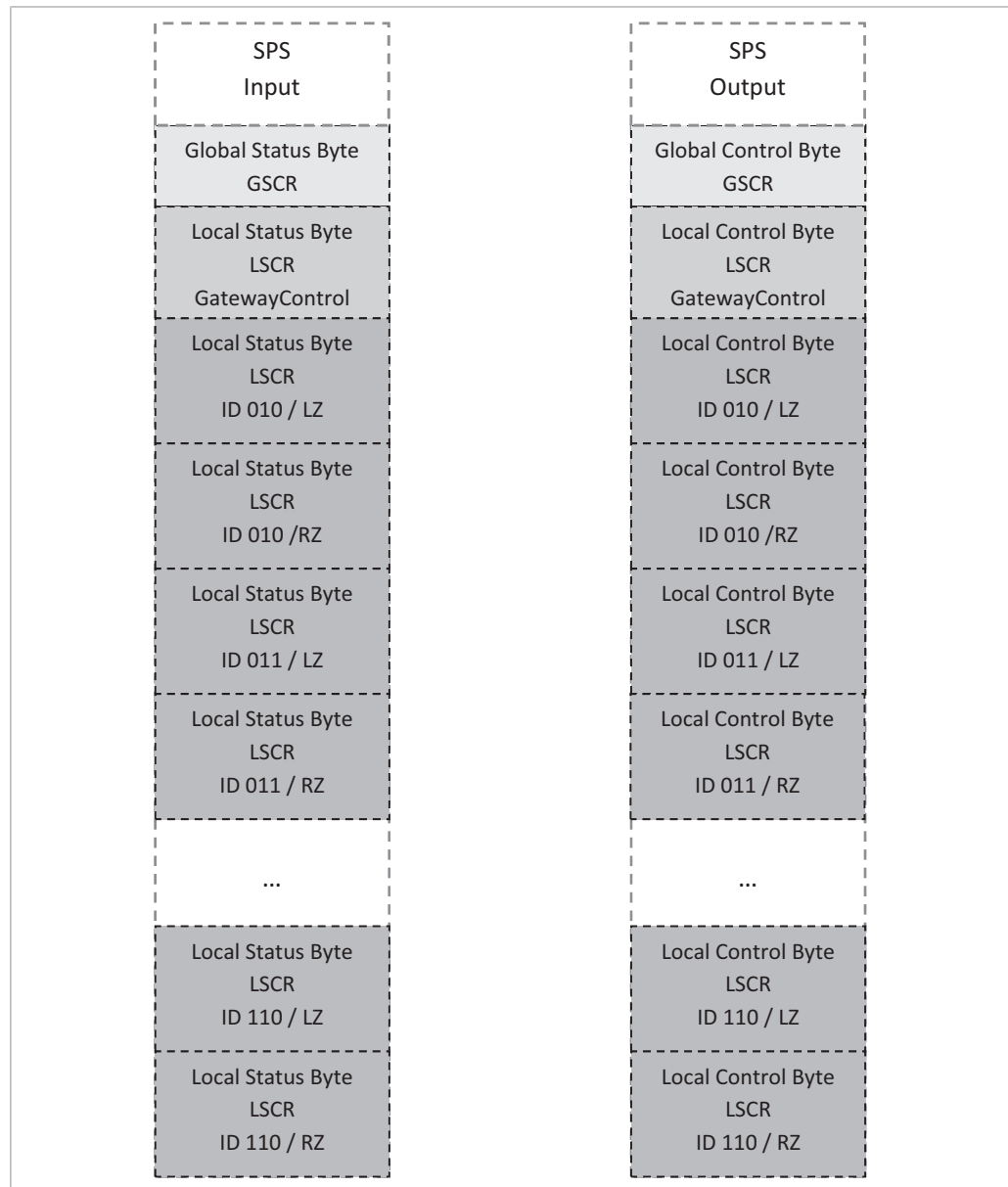
- Control Mode** Is only relevant for GatewayControl, for CentralControl it is permanently set to *Decentralized*.
- MACAddress** Ethernet hardware address of the GatewayControl (read value only). The address is displayed only if there is a USB connection to the GatewayControl and the ConveyorControl modules have been addressed.
- NodeID** Shows the number of the selected module that was assigned to each module during construction and that is a synonym for the address.
- ProductKey** If the Configurator is connected to the ConveyorControl system, the Interroll article number is displayed for the selected module.
- Serial** If the Configurator is connected to the ConveyorControl system, the Interroll serial number is displayed for the selected module.

## Interroll ConveyorControl

### Appendix

#### PLC process map – Cyclical data

The process data pool contains one Local Status Byte (LSCR) per zone (each as input and as output). One LSCR is assigned to the GatewayControl. This results in 201 bytes of I/O data for local zone information. One Global Status Byte (GSCR) was defined for the global system status or for global control commands. If the data modules are aligned flush in the I/O area of the control system for Profibus/Profinet (slot assignment see "Slot assignment for Profibus/Profinet", page 113), the following structure of the process map results:



In the Configurator, the display can be toggled between user zone designation and node ID (see "Changing the zone designation", page 36).

## Interroll ConveyorControl

### Appendix

SegmentControl and ComControl are addressed with a node ID that is assigned by the Configurator during project planning of the conveyor system.

In the previous diagram, *ID 010 Z* refers to the left zone of a SegmentControl or the zone of a ComControl with node ID 10. *ID 011/RZ* indicates the right zone of a SegmentControl with node ID 11. A ComControl uses only the LSCR entry for the left zone. The entry reserved for the right zone of this node ID in the process map is not used.

From the node ID, the zone address is calculated:

- For the left zone: Zone address := ((node ID - 10) \* 2) + 1
- For the right zone: Zone address := ((node ID - 10) \* 2) + 2

The calculated zone address is used for the zone selection during acyclical write/read access (error status/setting values of the zones). As an alternative to calculating the zone address, the address can also be exported via the Configurator (see "*Changing the zone designation*", page 36). From the zone address you can also calculate an index to the process map of the GatewayControl that allows for reading or writing the zone status and control register.

The index to the process map is calculated as follows:

- Index := (zone address - 1) + 2

And consequently the I/O address for a specific zone of the conveyor system:

- I/O address := BaseAddress + Index

#### LSCR – Local State/Control Register for the control mode I/O PLC control

Bit position	7	6	5	4	3	2	1	0
Acronym	<b>ERR</b>	<b>LSTA</b>	<b>ISTA</b>	<b>LSTP</b>	<b>ISTP</b>	<b>ZS</b>	<b>RDS</b>	<b>ZSS</b>
Read/Write	R	R/W	R/W	R/W	R/W	R	R	R
Description	Zone Error	Start Z one zone	Start D one zone	Stop Z one zone	Stop D one zone	Zone transport state	RollerDrive state	Zone sensor state
Bit Low	No error	de-active	de-active	de-active	de-active	Zone free	RD stopped	No object detected
Bit High	Error	active	active	active	active	Zone not free	RD running	Object detected
Comment	Not set, if all error modes configured to 'ignore'.	RollerDrive starts with regards to the ZPA logic	RollerDrive starts immediately (regardless of the ZPA logic)	RollerDrive stops if an object is detected by the zone sensor	RollerDrive stops immediately (regardless of the ZPA logic)			

## Interroll ConveyorControl

### Appendix

#### LSCR – Local State/Control Register for the control mode Full PLC control

Bit position	7	6	5	4	3	2	1	0
Acronym	ERR	IO3	IO2	IO1	ZSE	RDE	RDS	ZSS
Read/Write	R	R/W	R/W	R/W	R	R	R/W	R
Description	Zone Error	Digital I/O State In3 / Out3	Digital I/O State In2 (AS) / Out2	Digital I/O State In1 (ZS) / Out1	Zone Sensor error	RollerDrive error	RollerDrive state	Zone sensor state
Bit Low	No error	Not active / Off	Not active / Off	Not active / Off	No error	0 = no error	RD stopped	No object detected
Bit High	Error	Active / On	Active / On	Active / On	Error	Error	RD running	Object detected
Comment	Not set, if all error modes configured to 'ignore'.				Not set, if ZS error mode configured to 'ignore'.	Not set, if RD error mode configured to 'ignore'.		

#### LSCR – Local State/Control Register for the control mode Full PLC control and I/O PLC control for the GatewayControl

Bit position	7	6	5	4	3	2	1	0
Acronym	ERR	---	---	---	---	---	---	---
Read/Write	R	---	---	---	---	---	---	---
Description	Master Error	---	---	---	---	---	---	---
Bit Low	No error	---	---	---	---	---	---	---
Bit High	Error	---	---	---	---	---	---	---
Comment		---	---	---	---	---	---	---

## Interroll ConveyorControl

### Appendix

#### GSCR – Global Status/Control Register for the control mode I/O PLC control

Bit position	7	6	5	4	3	2	1	0
Acronym	<b>TDIR</b>	<b>SSEL</b>	<b>ERRSIG</b>	<b>CVRST</b>	<b>LSTP</b>	<b>ISTP</b>	<b>CLRI</b>	<b>CLR</b>
Read/Write	R/W	R/W	R	W	R/W	R/W	R/W	R/W
Description	Conveying direction	Speed selection	Error Indication	System restart	Stop Z all zones	Stop D all zones	Clear (empty conveyor) reverse direction	Clear (empty conveyor) normal direction
Bit Low	normal	Main speed	No error	de-active	de-active	de-active	de-active	de-active
Bit High	inverted	Alternative speed	At least one error somewhere in the system	active	active	active	active	active
Comment			ComControl modules with configured error output will reflect the state of this bit at the corresponding output.	Global restart of the conveyor system	All RollerDrives will stop if an object is detected by the corresponding zone sensor	All RollerDrives stop immediately (regardless of the ZPA transport logic)		

#### GSCR – Global Status/Control Register for the control mode Full PLC control

Bit position	7	6	5	4	3	2	1	0
Acronym	<b>TDIR</b>	<b>SSEL</b>	<b>ERRSIG</b>	<b>CVRST</b>	---	<b>ISTP</b>	<b>CLRI</b>	<b>CLR</b>
Read/Write	R/W	R/W	R	W	N/A	R/W	R/W	R/W
Description	Conveying direction	Speed selection	Error Indication	System restart	Not used	Stop D all zones	Clear (empty conveyor) reverse direction	Clear (empty conveyor) normal direction
Bit Low	normal	Main speed	No error	de-active	---	de-active	de-active	de-active
Bit High	inverted	Alternative speed	At least one error somewhere in the system	active	---	active	active	active
Comment			ComControl modules with configured error output will reflect the state of this bit at the corresponding output.	Global restart of the conveyor system	---	All RollerDrives stop immediately (regardless of the ZPA transport logic)		

## Interroll ConveyorControl

### Appendix

#### Setting values/errors – Acyclical process data

The error status and setting values of the overall system or of individual conveying zones are accessed via acyclical read and write access according to DPV1 Class 1 (Profibus/Profinet) or Explicit Messaging (EtherNet/IP). Device identification and alarms are also transmitted acyclically.

##### Error status and setting values

For Profibus/Profinet, the function blocks RDREC or WRREC are used for access in accordance with IEC 61131-3. The *ID* parameter must be supplied with the I/O base address of the ConveyorControl module that represents the error status or the desired setting value according to the table below. The *Index* parameter is used to select the desired conveyor system zone. A calculation rule exists for the zone number (see "PLC process map – Cyclical data", page 106). GatewayControl is addressed with index 0.

For EtherNet/IP, the MSG directive is used for access, whereby a CIP message of service type GetAttribute\_Single or SetAttribute\_Single must be used. Details see "CIP objects for EtherNet/IP", page 114.

Setting values that changed from the default configuration are not stored in GatewayControl. They must be downloaded again after a supply voltage failure.

Slot no./ function	Index/zone address	Access	Description of functions	Data length/data content
6	Zone address 000-200	Read	Reading the error register GatewayControl = Index 000	16 bit – see error register definition (ERR)
7	Zone address 001-200	Read/write	Reading/setting the RD direction of rotation	16 bit – 0 = CW, 1 = CCW
8	Zone address 001-200	Read/write	Reading/setting the RD speed as a converted value	16 bit – 0...255 speed setpoint
9	Zone address 001-200	Read/write	Reading/setting the alternative RD speed as a converted value	16 bit – 0...255 speed setpoint
10	Zone address 001-200	Read/write	Reading/setting the RD acceleration (startup ramp) as a converted value	16 bit – HiByte – time unit 0...255 16 bit – LoByte – increment 0...255
11	Zone address 001-200	Read/write	Reading/setting the RD deceleration (braking ramp) as a converted value	16 bit – HiByte – time unit 0...255 16 bit – LoByte – increment 0...255

## Interroll ConveyorControl

### Appendix

#### Zone error register (ERR)

Each error register of a zone maps only the error state of that individual zone, while the error register of the GatewayControl always returns the cumulative error of the entire system.

Bit position	15	14	13	12	11	10	9	8
Acronym	<b>SYS</b>	<b>IPAR</b>	---	<b>SLRD</b>	---	<b>GET2</b>	---	<b>GET1</b>
Read/Write	R	R	R	R	R	R	R	R
Description	System error	Parameter Error	Not used	Slave RollerDrive Error	Not used	TimeOut2 Error	Not used	TimeOut1 Error
Bit Low	No error	No error	---	No error	---	No error	---	No error
Bit High	Error	Error	---	Error	---	Error	---	Error
Comment	Voltage-, temperature-, RollerDrive- or sensor-error. (Behavior of RD- and sensor-errors can be configured)	Zone has no valid conveying parameters.	---	Slave RollerDrive signals error condition.	---	No sensor signal while transporting the loaded cargo towards the zone exit.	---	No sensor signal while loading the cargo into the zone.

Bit position	7	6	5	4	3	2	1	0
Acronym	---	<b>SENS</b>	---	<b>RD</b>	<b>CON</b>	<b>ML</b>	<b>VO</b>	<b>TMP</b>
Read/Write	R	R	R	R	R	R	R	R
Description	Not used	Sensor Error	Not used	RollerDrive Error	Communication Error	Connection Error	Voltage Error	Temperature Error
Bit Low	---	No error	---	No error	No error	No error	No error	No error
Bit High	---	Error	---	Error	Error	Error	Error	Error
Comment	---	Zone sensor signals error condition.	---	RollerDrive signals error condition.	Faulty transmission on Conveyor-Control bus.	No heart beat message from master received.	Supply voltage out of range.	Brake resistor too hot.

## Interroll ConveyorControl

### Appendix

#### Extended error register (ERREXT)

The extended error register breaks down the system error in more detail. It is updated each time for the most recently reported error.

Bitposition	15-8	7	6	5	4	3	2	1	0
Acronym	<b>NodeID</b>	<b>NETRF</b>	<b>NETCF</b>	<b>NETU</b>	<b>NCE</b>	<b>NSC</b>	<b>NRB</b>	<b>HBL</b>	<b>NIE</b>
Read/Write	R	R	R	R	R	R	R	R	R
Description	ID of faulty module	Transmission cycle failed	Module check at startup failed	Network Unavailable	Communication error	Unexpected communication state	Unexpected module restart	Heart beat lost	Module issued system error
Bit Low		No error	No error	No error	No error	No error	No error	No error	No error
Bit High		Error	Error	Error	Error	Error	Error	Error	Error
Comment	Node ID of the last module which caused a system error.	Module didn't respond to a transmission request on the Conveyor-Control bus.	Module signaled a system error during system initialization.	Health check of Conveyor-Control bus during system initialization failed.	Module signaled a transmission error on the Conveyor-Control bus.	Module is not in the expected communication state.	Module did an unexpected restart.	Module is missing heart beat messages from the master.	Module signaled a system error during normal system operation.

For EtherNet/IP, the extended error register can be read via the Adapter Object (class attribute 10).

For Profibus/Profinet, the extended error register is transmitted with a diagnostics alarm.



## Interroll ConveyorControl

### Appendix

#### Slot assignment for Profibus/Profinet

The GatewayControl is logically divided into 11 modules that are permanently assigned to the slots described below:

Slot no.	Module name	Description of functions	Data length
1	GSCR & Master Zone IO Data	Global Status/Control Register I/O data of GatewayControl	2 bytes
2	I/O Data for 64 Zones	I/O data of conveying zones 1 - 64	64 bytes
3	I/O Data for 64 Zones	I/O data of conveying zones 65 - 128	64 bytes
4	I/O Data for 64 Zones	I/O data of conveying zones 129 - 192	64 bytes
5	I/O Data for 8 Zones	I/O data of conveying zones 193 - 200	8 bytes
6	STATUS Error Register [R]	Reading the error register asynchronously	Asynchronous
7	PARAM RD Direction [RW]	Reading/writing conveyor direction	Asynchronous
8	PARAM RD Speed 1 [RW]	Reading/writing conveying speed 1	Asynchronous
9	PARAM RD Speed 2 [RW]	Reading/writing conveying speed 2	Asynchronous
10	PARAM RD Ramp Start [RW]	Reading/writing acceleration	Asynchronous
11	PARAM RD Ramp Stop [RW]	Reading/writing deceleration	Asynchronous

Slots 6 to 11 are used exclusively for addressing the asynchronous data. The data stored in the I/O area of the control have no significance.

## Interroll ConveyorControl

### Appendix

#### CIP objects for EtherNet/IP

##### Identity Object

This object is used for device identification. The following information applies to the device description object of EtherNet/IP GatewayControl.

Class code	0x01
Class attributes	1, 2, 6, 7
Instances	1
Instance attributes	1, 2, 3, 4, 5, 6, 7, 8, 9

#### Class attributes of Identity Object

ID	Access	Designation	Data type	Data value
1	Read	Class revision	UINT	1
2	Read	Read maximum number of instances	UINT	1
6	Read	Read highest class attribute	UINT	7
7	Read	Read highest instance attribute	UINT	10

Access methods: *Get\_Attribute\_All*, *Get\_Attribute\_Single*

#### Instance attributes of Identity Object

ID	Access	Designation	Data type	Data value
1	Read	Manufacturer ID	UINT	0x0275
2	Read	Device type	UINT	0x000C
3	Read	Product code	UINT	0x0001
4	Read	Revision ID	STRUCT	
		Main number	USINT	1
		Secondary number	USINT	1
5	Read	Device status	WORD	See CIP Standard, Vol. 1
6	Read	Device serial number	UDINT	Device-dependent
7	Read	Product name	STRING	"GatewayControl Ethernet/IP"
8	Read	Device status	USINT	See CIP Standard, Vol. 1
9	Read	Configuration status	UINT	See CIP Standard, Vol. 1
10	Read	Heartbeat interval ( <i>Get_Attribute_All</i> only)	USINT	See CIP Standard, Vol. 1

Access methods: *Get\_Attribute\_All*, *Get\_Attribute\_Single*

##### Assembly Object

This object allows for exchanging cyclical useful data. The following information applies to the I/O object of EtherNet/IP GatewayControl.

Class code	0x04
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## Interroll ConveyorControl

### Appendix

Class attributes	1, 2
Instances	1
Instance attributes	3, 4

#### Class attributes of Assembly Object

ID	Access	Designation	Data type	Data value
1	Read	Class revision	UINT	1
2	Read	Maximum number of instances	UINT	X

Access methods: *Get\_Attribute\_Single*

#### Instance attributes of Assembly Object

ID	Access	Designation	Data type	Data value
3	Read/set	Data	BYTE[]	
4	Read	Data length	UINT	202

Access methods: *Get\_Attribute\_Single*, *Set\_Attribute\_Single*

### Connection Manager Object

This object indicates the options for connecting to the adapter and configures these. The following information applies to the connection manager object of EtherNet/IP GatewayControl.

Class code	0x06
Class attributes	1, 2
Instances	0
Instance attributes	

#### Class attributes of Connection Manager Object

ID	Access	Designation	Data type	Data value
1	Read	Class revision	UINT	1
2	Read	Maximum number of instances	UINT	1

Access methods: *Get\_Attribute\_Single*

### Adapter Object

This object is device-specific and establishes the interface to the device functionality. It serves as configuration and monitoring interface to an EtherNet/IP scanner. Expanded diagnostics are kept here and access to parameter data is made possible. The following information applies to the application object of EtherNet/IP GatewayControl.

Class code	0x64
Class attributes	1, 2, 3, 6, 7, 8, 9, 10
Instances	200 (1...200 = zone number)
Instance attributes	6, 7, 8, 9, 10, 11
Services	<i>Get_Attribute_Single</i> , <i>Set_Attribute_Single</i>

## Interroll ConveyorControl

### Appendix

#### Class attributes of Adapter Object

ID	Access	Designation	Data type	Data value
1	Read	Class revision	UINT	1
2	Read	Highest instance number	UINT	200
3	Read	Number of generated instances	UINT	200
6	Read	Highest class attribute	UINT	10
7	Read	Highest instance attribute	UINT	11
8	Read/set	Read/set GSCR	USINT	see description of functions
9	Read	System-wide error register	UINT	see description of functions
10	Read	System-wide expanded error register	UINT	see description of functions

Access methods: *Get\_Attribute\_Single*, *Set\_Attribute\_Single*

#### Instance attributes of Adapter Object

ID	Access	Designation	Data type	Data value
6	Read	Zone error register	UINT	see description of functions
7	Read/set	RollerDrive direction of rotation	UINT	see description of functions
8	Read/set	RollerDrive speed	UINT	see description of functions
9	Read/set	RollerDrive alternate speed	UINT	see description of functions
10	Read/set	RollerDrive acceleration value	UINT	see description of functions
11	Read/set	RollerDrive braking value	UINT	see description of functions

Access methods: *Get\_Attribute\_Single*, *Set\_Attribute\_Single*

#### TCP/IP Interface Object

This object is used for configuring the TCP/IP interface. The following information applies to the TCP/IP object of EtherNet/IP GatewayControl.

Class code	0xF5
Class attributes	1, 2
Instances	1
Instance attributes	1, 2, 3, 4, 5, 6, 10

#### Class attributes of TCP/IP Interface Object

1 Read UINT 2 2 Read UINT 1

ID	Access	Designation	Data type	Data value
1	Read	Class revision	UINT	2
2	Read	Maximum number of instances	UINT	1

## Interroll ConveyorControl

### Appendix

Access methods: *Get\_Attribute\_Single*

#### Instance attributes of TCP/IP Interface Object

ID	Access	Designation	Data type	Data value
1	Read	Status attributes	DWORD	See CIP Standard, Vol. 2
2	Read	Configuration attributes	DWORD	0x00000095
3	Read/set	Configuration control attributes	DWORD	0x00000000
4	Read	Physical connection object	STRUCT	
		Path length (in 16-bit words)	UINT	0x0002
		Path	EPATH	20 F6 24 01
5	Read/set	Interface configuration	STRUCT	
		IP address	UDINT	xxx.xxx.xxx.xxx
		Network mask	UDINT	xxx.xxx.xxx.xxx
		Gateway address	UDINT	xxx.xxx.xxx.xxx
		Address of prim. name server	UDINT	xxx.xxx.xxx.xxx
		Address of sec. name server	UDINT	xxx.xxx.xxx.xxx
		Domain name	STRING	""
6	Read/set	Host name	STRING	"gateway"
10	Read/set	ACD status	USINT	1
11	Read/set	Last ACD conflict	STRUCT	
		ACD activity	USINT	0
		Remote MAC	USINT[6]	XX:XX:XX:XX:XX:XX
		Copy of ARP PDU	USINT[28]	0

Access methods: *Get\_Attribute\_All*, *Get\_Attribute\_Single*, *Set\_Attribute\_Single*

#### EtherNet Link Object

Connection-specific status and counter information. The following information applies to the EtherNet link object of EtherNet/IP GatewayControl.

Class code	0xF6
Class attributes	1, 2, 3
Instances	1, 2
Instance attributes	1, 2, 3, 6, 10

#### Class attributes of EtherNet Link Object

1 Read UINT 3 2 Read UINT 2 3 UINT 1,2

ID	Access	Designation	Data type	Data value
1	Read	Class revision	UINT	3

## Interroll ConveyorControl

### Appendix

ID	Access	Designation	Data type	Data value
2	Read	Maximum number of instances	UINT	2
3	Read	Read number of existing instances	UINT	1, 2

Access methods: *Get\_Attribute\_Single*

### Instance attributes of EtherNet Link Object

ID	Access	Designation	Data type	Data value
1	Read	Interface speed	UDINT	0x00000064
2	Read	Interface flags	DWORD	0x0000002F
3	Read	Physical MAC address	USINT[6]	00:02:A2:XX:XX:XX
6	Read/set	Interface control	STRUCT	
		Control bits	WORD	0x0001
		Required interface speed	UINT	0x0000
10	Read	Interface label	STRING	"port1"

Access methods: *Get\_Attribute\_All*, *Get\_Attribute\_Single*, *Set\_Attribute\_Single*

## Interroll ConveyorControl

### Appendix

#### Electrical data of connections

Connection	Pin	Nominal value	Area	Comment
Power		+24 V	19 ... 26 V DC (short-term)	DC voltage free of harmonics Current consumption: permanent 3 A <sub>eff</sub> , max. peak current 5.5 A @ 500 ms, repetition rate 1 Hz
		GND	0	Functional grounding permitted, negative voltage not permitted
Data Data A1 Data A2				Bus communication, connection of non-system voltages and loads not permitted
RD	+24 V	+24 V DC	-	Overvoltage protection up to +30 V DC
RD left RD right	DIR	0 V DC	0 to +4 V DC	Level for counterclockwise direction of rotation
		+12 V DC	+7 to +12 V DC	Level for clockwise direction of rotation
	GND	GND	0	Internally connected to the GND connection of the operating voltage, negative voltage not permitted
	ERROR	0 V DC	0 to +4 V DC	RollerDrive: no error
		+12 V DC	+10 to +12 V DC	RollerDrive: Error
	SPEED		0 to +10 V DC	Reference potential = GND
Sensor left	Pin 1	+24 V DC	max. +26 V DC	max. current load: 100 mA
Sensor right	Pin 2	0 V DC or +24 V DC	0 to 26 V DC	Signal input
Zone Sensor/In 1	Pin 3	GND	0	Internally connected to the GND connection of the operating voltage, negative voltage not permitted
Add. Sensor/In 2	Pin 4	0 V DC or +24 V DC	0 to 26 V DC	Signal input
In 3	+24 V	+24 V DC	max. + 26 V DC	max. current load: 100 mA
	Signal	0 to +24 V DC	0 to +26 V DC	
	GND	GND	0	Internally connected to the GND connection of the operating voltage, negative voltage not permitted

## Interroll ConveyorControl

### Appendix

Connection	Pin	Nominal value	Area	Comment
Output 1 Output 2	+	PNP switching output (NO)		switches against operating voltage of the module (rated value = + 24 V DC), active = switched, not active = blocked, max. load current 0.5 A, overload-proof and short circuit-proof, no overvoltage protection The switching levels are directly connected to the +24 V DC/GND connections of the power connection without a fuse. In the event of an overload, the current is automatically limited which, depending on the current, ambient temperature and duration of the overload, results in a thermal cut-off. Once the overload has been reduced, the switching level automatically switches on again (the ComControl must have cooled down by approx. 15 K in relation to the temperature at the time of switching off). This overload protection does not offer line and load protection; it serves exclusively to protect the switching level.
	-	GND	0	Internally connected to the GND connection of the operating voltage
Relay	a/b	NO relay contacts (electrically isolated) Switching capacity: max. 24 V/2 A		Switching capacity data apply to resistive load
USB		USB 2.0		Only permitted for use as a data interface

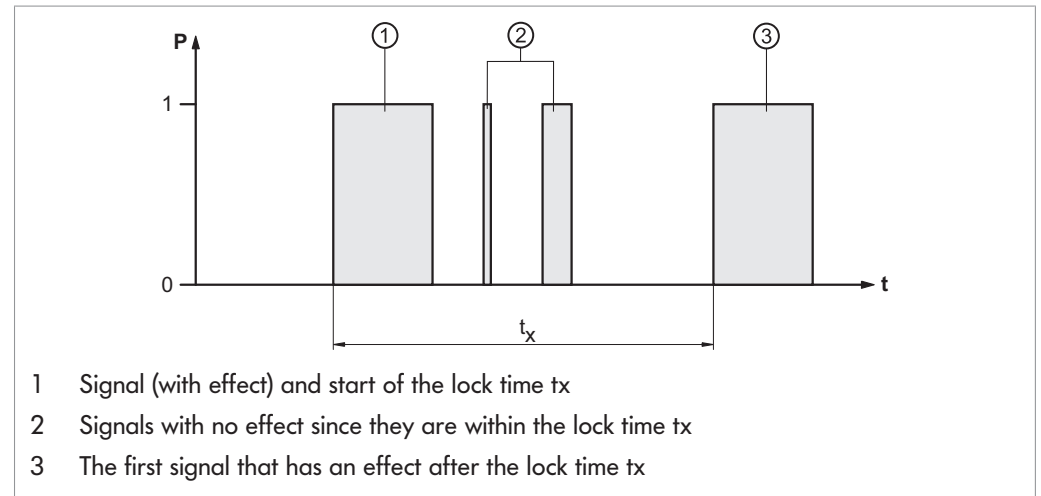


## Interroll ConveyorControl

### Appendix

#### Lock time with bouncing level

All signal inputs are protected by the firmware to ensure functionality in case of a bouncing level. This means that after a signal status change, there is a lock period of 60 ms in which no additional status change is processed.





## Interroll ConveyorControl

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### Appendix

### Declaration of Conformity

The manufacturer:

Interroll Engineering GmbH  
Hoferhof 16  
D - 42929 Wermelskirchen  
Germany

hereby declares that the product series

- GatewayControl-Ethernet IP, -Profinet, -Profibus
- CentralControl
- SegmentControl, ComControl

meets the requirements of the directives and standards listed below:

#### **Applied EU Directives:**

- 2014/30/EU EMC
- 2011/65/EU RoHS Directive

#### **Applied harmonized standards:**

- EN 61000-4-2
- EN 61000-4-3
- EN 61000-4-4
- EN 61000-4-5
- EN 61000-4-6
- EN 61000-4-8

Person authorized to prepare the technical documents:

Interroll Engineering GmbH, Hoferhof 16, D - 42929 Wermelskirchen, Germany

Wermelskirchen – June 30, 2015

Armin Lindholm  
(Manager)



