FROM CREATORS FOR CREATORS

automation supply

AS DUAL | ASD2448

# Dual Motor Controller

Released: 24/04/2025
Version: 3.1


## Manufacturer details

AUTOMATION SUPPLY
Ondernemingenweg 26
5627 BV Eindhoven
The Netherlands

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# 1 | INTRODUCTION

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 1.1 Contents of this manual

This manual contains important product information for the AS Dual Controller. It includes the intended use, integral safety measures and guides for servicing, transport and storing conditions.

The document also describes technical support for installation, maintenance and troubleshooting. This manual is part of the product. Therefore, the product cannot be used without consulting the manual prior to installation or use.

## 1.2 Intended Use

AS Dual motor controllers can be used to control AS motors and motor driven rollers but also other renowned brands in the market. The open concept allows for future changes on demand.

The controllers are commonly used to control BLDC motors in the field of:

- Conveyor modules
- Sorter and Diverters
- Linear motion applications
- Peripheral controls & HMI device

## 1.4 General Safety Measures

Please study the general safety measures provided in this document to minimize risks and faulty use of the product.
The AS Dual Controller has been designed to meet safety standards in this field of application, however risks may still occur when used inappropriately.

1. It is required to study and follow the manual and keep this manual in a safe and visual location near the system.
2. The supplier cannot be held responsible for faults and defects that would have been avoided by following this manual.
3. The supplier cannot be held responsible when changes are made and/or added to the system which have not been described and/or allowed in the manual.
4. The AS Dual Controller is developed to be integrated in the specified conveying systems with regards to the professional risk assessment of the integrator.
5. The power must always be switched off when maintenance or installation work is performed on the AS Dual Controller. Ensure that power cannot be accidentally switched on.

## 1.3 Qualified Personnel

Only qualified personnel is allowed to work with or integrate the AS Dual Controller. Qualified personnel is expected to understand this manual and know national/ international safety regulations regarding industrial applications in the field of automation and intralogistics.

Take the following in consideration:

1. Relevant diagrams and user manuals of the AS Dual Controller.
2. Regulations and requirements that are specific to this product and the integration solution.
3. Safety and warning instructions as provided by this document. National/ International and local safety regulations.

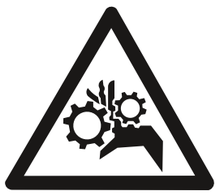


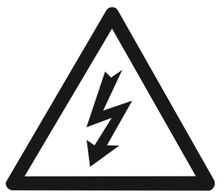


## 1.5 Dangers

While working with the AS Dual Controller, dangers may occur. Consult this list to prevent faulty installation, malfunction, or hazardous situations.

1. Maintenance and repair may only be executed by authorized and qualified personnel according to the appropriate national safety regulations. Otherwise, serious bodily injury may occur.
2. Before initiating or using the AS Dual Controller, make sure all unauthorized personnel has cleared the working area of the conveyor.
3. Make sure the AS Dual Controller is only operated with I/O control voltages compliant with a SELV environment.
4. The power must always be switched off when maintenance or installation work is performed on the AS Dual Controller. Ensure that power cannot accidentally be switched on.
5. Check for visible damage regularly. Also, make sure mounts and screws are correctly tightened.
6. If you notice any faulty controller or system behavior, immediately cut the power and make sure it cannot accidentally be switched on. Contact qualified personnel to perform troubleshooting.
7. Make sure no unnecessary tools or equipment is near the system when in operation. Tools or screws falling on the conveyor may cause serious damage to the system.
8. When installing or troubleshooting the conveyor system, be aware that sensors or other signals may be triggered unintentionally, leading to hazardous situations. Be sure to always turn the power off in the event of installation or maintenance/troubleshooting.
9. Never try to open an AS Dual Controller.





# 2 | GENERAL INFORMATION

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 2.1 Product description

The AS Dual Motor Controller is designed to control two BLDC Motors of the AS brand and various other brands in the market.

AS Dual Controllers can communicate with neighboring Controllers via Ethernet to create a stand-alone system. Furthermore the controllers can be connected to an industrial network such as Profinet in order to provide additional control.

The AS Dual Controller is a one of a kind product with advanced features such as zero pressure accumulation, configurable I/O, firmware configurations and a market first 3.5 inch HMI for unlimited application variations and detailing.

## 2.2 Protection

AS Dual motor controllers are powered externally by using 24 or 48 VDC power. Use 24 V motors when connecting a 24 VDC Power Supply, the same applies for 48 V motors and 48 VDC power supplies.

The AS Dual Controller has a built-in fuse that protects the user against short-circuit and faulty connection, while needing to replace the controller when the fuse is broken.

## 2.3 Key Functionalities

Industry experts as well as beginners can make use of all the meaningful features and functionalities of the AS Dual Controller.

### Real-Time Ethernet

One of the most essential features of the controller is the support of Real-Time Ethernet. This enables a PLC to control and monitor each controller. Currently, only PROFINET is supported.

### Current limitation

A desired current limit can be user-defined. When the rotation of the motor is blocked or the motor is running heavier, the controller will decrease the output power to hover around this value. The current limit is not a hard limit.

### Boost Mode (No Power Limitation)

When the rotation of the motor is blocked or the motor is running heavier, the controller will increase the output power to a maximum (4.5 A per motor in Boost mode).

### Overvoltage protection

AS Dual controllers are protected against generated power during stopping/braking. The overvoltage protection is not intended to protect against continuously generated overvoltages, such as when external forces drive the motor.

### Forward mode

With multiple controllers connected, it is possible to have all controllers and corresponding motors behave the same. This is particularly useful for long and simple conveyor systems. In this setup, it is only required to control a single AS Dual controller and the rest will copy the behavior.

### Zero Pressure Accumulation

AS Dual Controllers can provide plug-and-play Zero Pressure Accumulation (ZPA) applications. This allows for frictionless and connectionless transportation of goods.

### Configurable I/O

AS Dual Controllers have 6 configurable I/O that can be freely used for conveying applications as well as to connect peripherals, with a max output of 8.5 Watts per output.

### Dedicated E-Stop (SIL 4, Performance level E)

Our integrated E-stop is designed to be used in a SIL 3 or SIL 4 environment but this requires additional external monitoring

### Application Firmware

AS Dual Controllers can be installed with application-specific firmware for our modules to enable true plug-and-play functionalities.

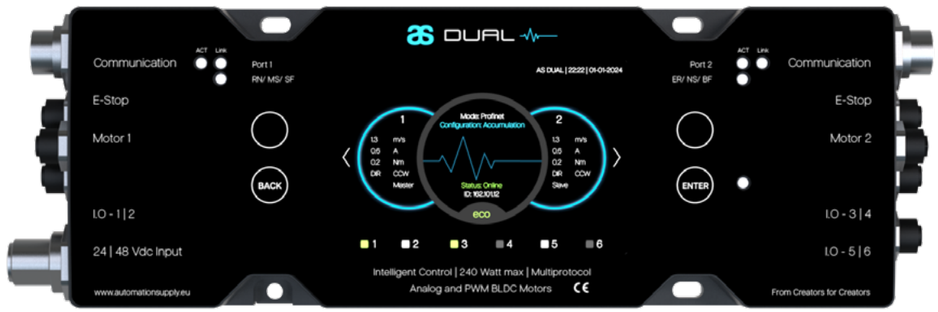




## 2.4 Scope of delivery

The scope of delivery defines what is included in the product, as well as required components that may be needed additionally in order to create a working application, it is advised to consult our website for training material to choose what components you need for your application or what kits are availlable. Or contact us via info@automationsupply.nl

| | Information | Specifications | Details | |
|---|---|---|---|---|
| 1 | AS Dual Controller | 2x motor \| 6x I/O \| 1x Power in \| 2x Emergency | 240 Watt | Included |
| 2 | M12 4-pin T coded Cable | Male to Female (for power) | 1.500 mm | Not Included |
| 3 | M12 4-pin D coded Cable | Male to RJ-45 (for communication) | 1.500 mm | Not Included |
| 4 | I/O Splitter Cable | 1x Snap in M8 \| 2x Screw M12 | 150 mm | Not Included |
| 5 | 3 pin Snap-in | 2x M8 male | 1.500 mm | Not Included |
| 6 | AS MDR or External Motor | 24V or 48V BLDC motors | 50 Watt | Not Included |
| 7 | M12 4-pin D coded Cable | Male to Male (for communication) | 1.500 mm | Not Included |
| 8 | M8 5-pin | Male to Femal extension cable (for motor) | 1.500 mm | Not Included |
| 9 | 24V or 48V Power Supply | 24V 10A or 48V 10A Powersupply | 240 Watt 24 V \| 480 Watt 48 V | Not Included |




### Product label

The label is located at the bottom of the product. An additional product label is included, in case the label is not visible after installation. The contents of the product label can also be found in the device settings.

# 3 | TECHNICAL SPECIFICATIONS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



## 3.1 Electrical Specifications

AS DUAL | ASD2448 Dual Motor Controller

| | 24 VDC Input | 48 VDC Input |
|---|---|---|
| Input voltage (Rated) | 24 VDC 10A \| range 18 - 26 VDC | 48VDC 6A \| range 42 - 52 VDC |
| Motor Outputs (Rated) | 2x 24 VDC at 4 A | 2x 48 VDC at 4 A |
| Starting Current | 4.5A at 24 VDC | 4.5A at 48 VDC |
| Power Consumption (Rated) | 240 W | 300 W |
| Motor Connector | M8 5-pin Snap-in[2x] | |
| I/O Connector | M8 4-pin Snap-in [3x] \| | |
| I/O Power | 350 mA at 24 VDC | |
| Emergency Connector | M8 3-pin Snap-in [2x] | |
| Overvoltage Protection | +32 V at 24 VDC | +60 V at 48 VDC |
| Temperature Protection | > 90 C° shut down, resets after temperature falls below 90 C° and speed or power toggle. | |
| Motor Interfaces | PWM 12Khz 10 V (10 - 100%) \| Analog 0 -10 V (10 - 100%) | |
| Communication Interfaces | Profinet \| I/O [1] | |
| Certifications | CE \| ETL [2] | |
| Ambient Temperature | Operation 0 to +40 C° \| Transport -20 to +80 C° | |
| Protection Rate | IP 54 \| IP65 (on request) [3] | |
| Installation Altitude | Max +1000 m from sea level | |
| Dimensions LxWxH | 210 x 79 x 32 mm | |
| Weight | 360 grams | |
| | | |
| Important information | • A short current spike can occur during start-up that exceeds the current cap of 4.5 A.<br>• Do not connect a 24 V motor when a 48 V power supply is connected.<br>• Do not connect a 48 V motor when a 24 V power supply is connected<br>• Actual power consumption and efficiency vary based on installation, load, and motor type | |

### Additional information

1. Currently TCP/ IP | Profinet and I/O are availlable. We always improve our products, please contact us if EtherCAT and Ethernet IP are required for your project.
2. Contact us for information about applications in countries that require ETL listed components.
3. Please contact us if your application requires IP 65 protection rate, or other requirements.

Please visit our www.automationsupply.eu for the latest 3D CAD drawings and other technical data.

## 3.2 Configurable I/O

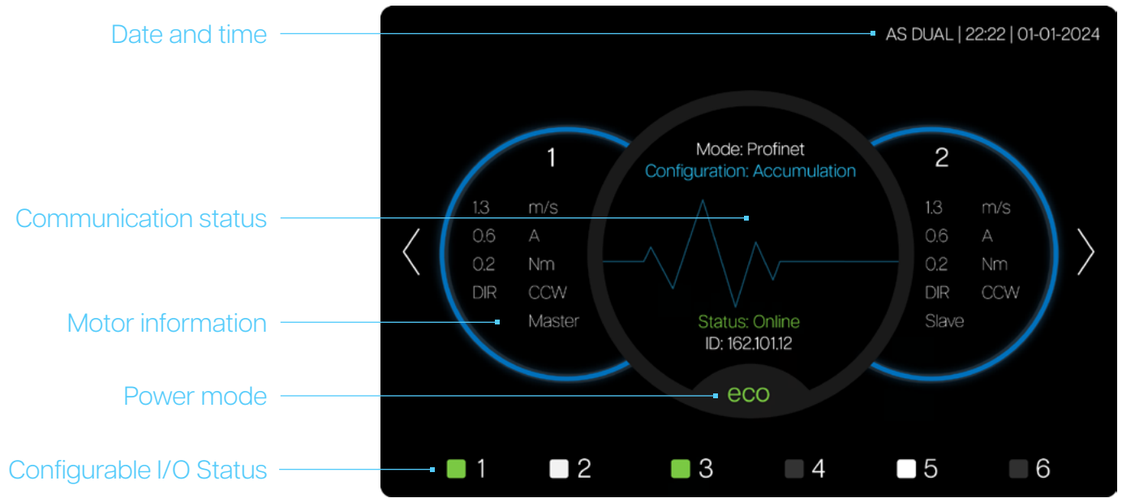
AS DUAL | ASD2448 Dual Motor Controller

| | |
|---|---|
| I/O power | 24 VDC |
| Input modes | PNP or NPN |
| Output | 24Vdc sink/source |
| Output Power | 350 mA |
| Protection | Short circuit connection \| over current |
| Connection type | M8 4-pin via splitter cable |
| I/O Allocation | Connector 1:I/O 1 and I/O 2 (Left side of controller)<br>Connector 2: I/O 3 and I/O 4 (Right side of controller)<br>Connector 3: I/O 5 and I/O 6 (Right side of controller) |

## 3.3 Display

AS DUAL | ASD2448 Dual Motor Controller

| | |
|---|---|
| Display specifications | 3.5 inch 480 x 320 px \| Full Color |
| Display notifications | 1. Real time Motor Information<br>2. Communication Status<br>3. Errors and warnings (Emergency, Connection status and Warnings)<br>4. Real time I/O status (On, Off and disabled)<br>5. Dashboard (Application, Power Mode and Configuration type) |



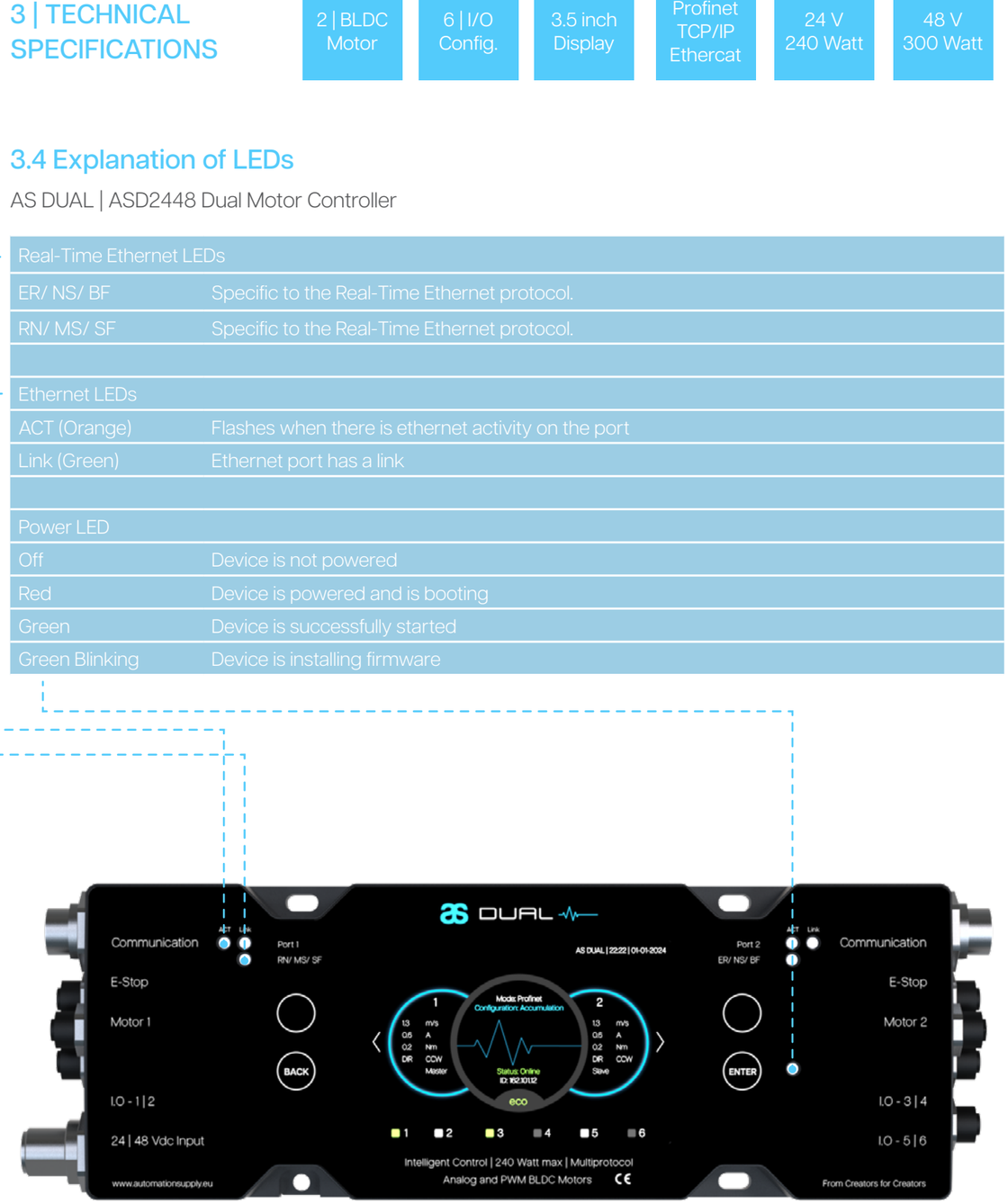
# 3 | TECHNICAL SPECIFICATIONS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 3.4 Explanation of LEDs

AS DUAL | ASD2448 Dual Motor Controller

| | |
|---|---|
| Real-Time Ethernet LEDs | |
| ER/ NS/ BF | Specific to the Real-Time Ethernet protocol. |
| RN/ MS/ SF | Specific to the Real-Time Ethernet protocol. |
| | |
| Ethernet LEDs | |
| ACT (Orange) | Flashes when there is ethernet activity on the port |
| Link (Green) | Ethernet port has a link |
| | |
| Power LED | |
| Off | Device is not powered |
| Red | Device is powered and is booting |
| Green | Device is successfully started |
| Green Blinking | Device is installing firmware |



# 4 | COMPONENTS & DIMENSIONS

2 | BLDC Motor

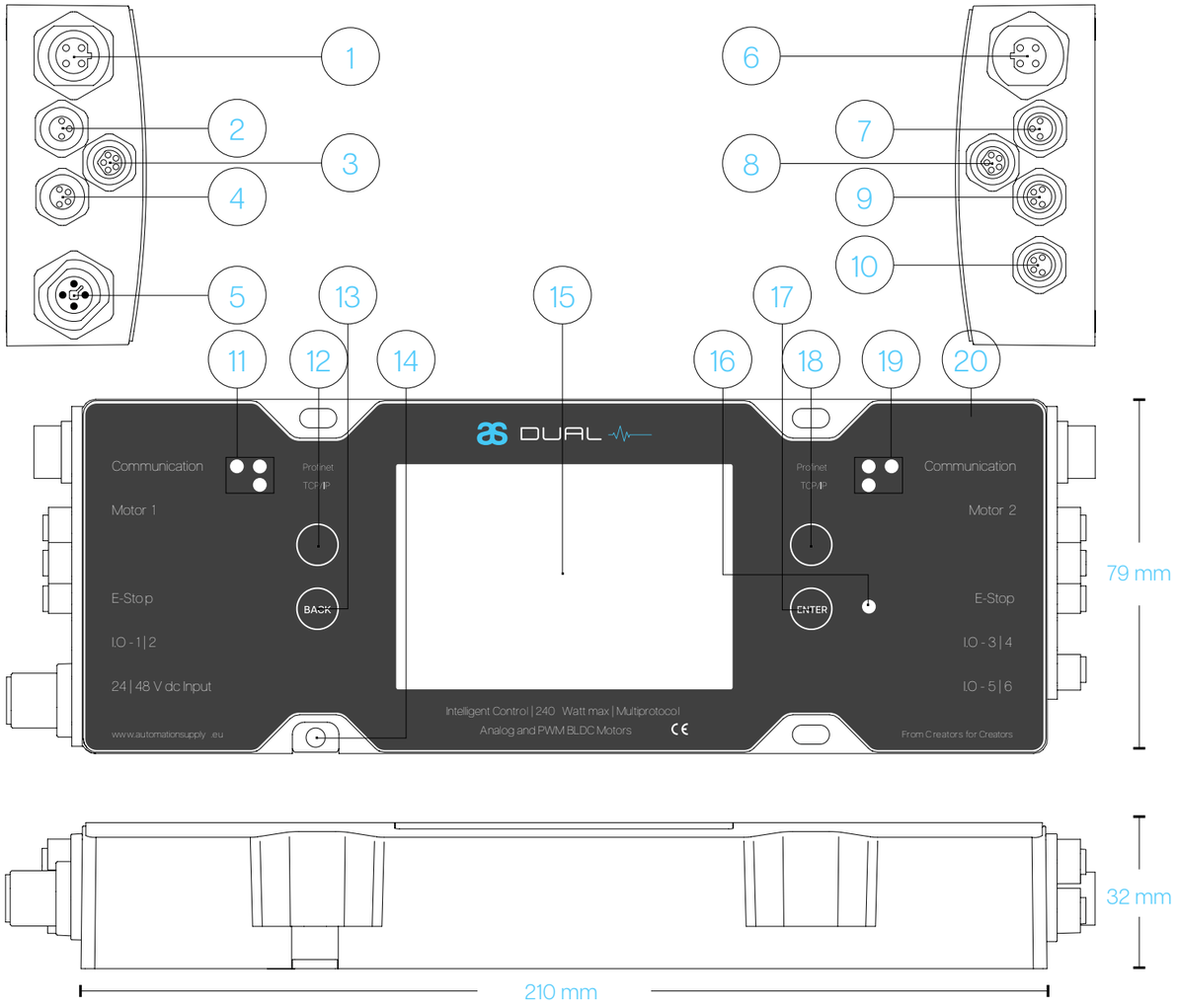
6 | I/O Config.

3.5 inch Display

Profinet TCP/IP Ethercat

24 V 240 Watt

48 V 300 Watt




| | Description | | | Description | |
|---|---|---|---|---|---|
| 1 | Communication A | M12 4P Female (D-coded) | 11 | Communication status A | LED |
| 2 | Emergency A | M8 3P Female (snap-in) | 12 | Multi purpose button A (Left or Up) | Button |
| 3 | Motor 1 | M8 5P Female (snap-in) | 13 | Return button (BACK) | Button |
| 4 | Configurable I/O 1 \| 2 | M8 4P Female (snap-in) | 14 | Ground for PE (use knurled washer) | Safety |
| 5 | Power in 24 \| 48 V | M12 4P Male (T-coded) | 15 | 3.5 inch full color display | Graphic UI |
| 6 | Communication B | M12 4P Female (D-coded) | 16 | Power status | LED |
| 7 | Emergency B | M8 3P Female (snap-in) | 17 | Enter button (OK) | Button |
| 8 | Motor 2 | M8 5P Female (snap-in) | 18 | Multi purpose button B (Right or Down) | Button |
| 9 | Configurable I/O 3 \| 4 | M8 4P Female (snap-in) | 19 | Communication status B | LED |
| 10 | Configurable I/O 5 \| 6 | M8 4P Female (snap-in) | 20 | Product Sticker | Adhesive Sticker |



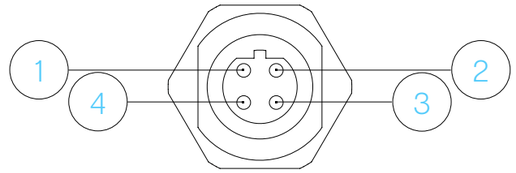
## 4.1 Connection Specifications

Communication Connector (female)

**M12 4-pin D-coded**

1 6

1. TD +
2. RD +
3. TD -
4. RD -

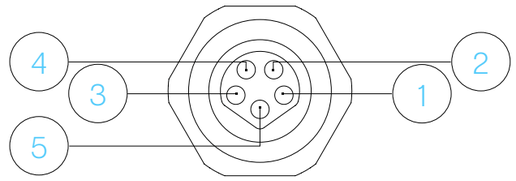



Motor Connector (female)

**M8 5-pin snap in**

3 8

1. 24 VDC / 48 VDC
2. Direction (<4V: CCW / >7V: CW)
3. GND
4. Error/ Pulse
5. Speed

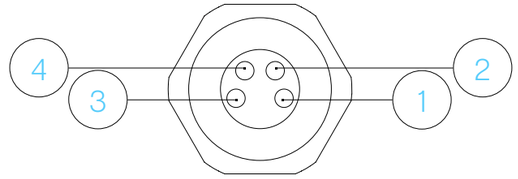



Configurable I/O Connector (female)

**M8 4-pin snap in**

4 9 10

1. 24 VDC
2. Sig 2
3. GND
4. Sig 1

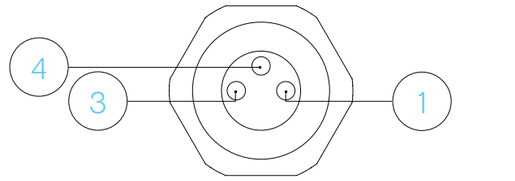



Emergency Connector (female)

**M8 3-pin snap in**

2 7

1. 24 VDC
3. GND
4. Sig 1

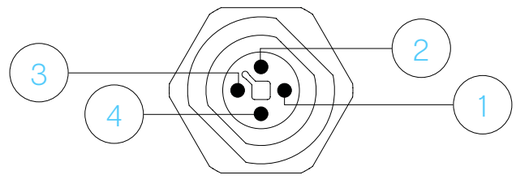



Power Connector (male)

**M12 4-pin T-coded**

5

1. 24 VDC / 48 VDC
2. Not Connected
3. Ground
4. PE



# 5 | SUPPORTED MOTORS & FEATURES

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 5.1 Supported motors

The AS DUAL controller is designed to drive two Motor Driven Rollers (MDR). The motor is connected using 5-pin M8 connector (snap-in) with analog (0-10V) interface. Besides AS motors, the brands of Interroll and Itoh Denki are also supported. The controller is compatible with both 24V and 48V motors. However, the user must ensure a voltage compatible with the connected motor is supplied to the AS controller.

| Supported Motors | | |
|---|---|---|
| **Automation Supply** | **Interroll** | **Itoh Denki** |
| AS 172 rpm | IR EC5000 108:1 | ID XE/XP 17 |
| AS 506 rpm | IR EC5000 78:1 | ID XE/XP 30 |
| AS 1033 rpm | IR EC5000 49:1 | ID XE/XP 60 |
| | IR EC5000 42:1 | ID XE/XP 100 |
| | IR EC5000 21:1 | |
| | IR EC5000 18:1 | |
| | IR EC5000 13:1 | |
| | IR EC5000 9:1 | |

### Supported motor features

| Feature | Automation Supply | Interroll | Itoh Denki |
|---|---|---|---|
| Analog Interface | o | o | o |
| Direction | o | o | o |
| Current Limit | o | o | o |
| Current Stall | o | o | o |
| Acceleration | o | o | o |
| Deceleration | o | o | o |
| Power Mode | o | o | o |
| Speed Correction | o | | |
| Speed Stall | o | | |
| Error Detection | o | | |

## 5.2 Analog interface

The speed of the motors is controlled by an analog interface. The analog voltage (0-10V) will determine if the motor should run and how fast it should run.

*Note: Itoh Denki Motors are controlled using 10 speed steps, the controller will respect this and will use the step closest to the selected speed.*





## 5.3 Run and Direction pins

The direction of the motor is controlled by a direction pin. The controller will automatically control this pin when the motor is moving slow enough to change the direction.

*Note: Itoh Denki Motors are controlled using a run pin, the controller will respect this and will use the run pin when necessary.*

## 5.4 Acceleration and Deceleration

If an acceleration and/or deceleration rate are configured, the motor will respect this rate while ramping up or down. If during running at constant speed the speed drops more than 10% of the maximum speed, the motor will enter ramping up state again to accelerate with the configured rate.

## 5.5 Power Mode, Current Limit, and Current Stall

The current of the motor is constantly measured. If the ECO power mode is configured, the controller will automatically reduce the motor speed if the motor exceeds the configured current limit. If the motor still draws more current than the limit for the configured time (Stall trip current), the motor will stall because of overcurrent. For more information see Stall Behaviour. To ensure a correct start-up of the motor, the controller will allow maximum current for a short configurable period of time after the motor starts running. If the BOOST power mode is configured, the current of the motor will never be limited.

## 5.6 Speed Correction and Speed Stall (Only with AS Motors)

The live speed of the motor is constantly measured and displayed on the screen. If the motor is running at a constant speed, the speed is corrected each second if the actual speed differs too much from the configured speed. If the speed reaches below 2% of the maximum speed for the configured time (Stall trip speed) the motor will stall because of speed.

If the motor is stalled, it will try to move again after three seconds. The controller will count how much retries have been made, this counter will be cleared once the motor is running for twice the amount of stall time. If the motor keeps stalling and the counter reaches the configured stall retries, the motor is completely shut down and will not retry again. Once this happens, an error will be thrown by the controller based on the stall condition. This can be Overcurrent or Speed. Only if the setting repeat retries is enabled, the motor will retry again after 60 seconds.

If a button on the controller is pressed, the retries will be reset and the motors will retry immediately.

## 5.7 Error Detection (Only with AS Motors)

The motor is able to detect an error within the motor, which can occur from various reasons. The most important are:

- Overtemperature
- Overcurrent
- Over- or Undervoltage
- Stall

The controller will detect that the motor has an error and immediately try to reset this error. If an error is detected, an exception will be thrown and visible on the screen. If the error has been successfully reset, the exception will be removed.

*See Chapter 6: Errors for an overview of all possible errors (Motor & Non-motor)*

# 6 | ERRORS



## 6.1 Error Overview

If an error occurs, a pop-up will appear on the display of the AS Dual Controller. The color of the pop-up signals the severity of the error. All possible errors with their corresponding colors and causes are explained in the table below.

| Type | Header Text | Detail Text | Remark |
|---|---|---|---|
| Emergency | EMERGENCY | | Emergency stop active, motors are de-energised by hardware. |
| Emergency | DFU FAIL | Emergency fail-safe update failed | Updating of fail-safe CPU failed, either the incorrect software is present on the flash or the fail-safe CPU is not responding. |
| Emergency | SAFETY FAIL | Emergency fail-safe test failed | The periodic fail-safe test has failed, motors are de-energised. |
| Error | LOAD FAILED | Segment n | Loading package on segment n failed within set timeout. |
| Error | DISPATCH FAILED | Segment n | Dispatching package from segment n failed within set timeout. |
| Error | OVERCURRENT | Motor n | Motor n stalled because the current consumption exceeded the set limit. |
| Error | ERROR | Motor n | Motor n reported an error. |
| Error | FLASH ERROR | Write failed | Writing data to the flash memory failed. |
| Error | COM.FAIL | Emergency fail-safe off-line | Fail-safe CPU is not responding. |
| Warning | CONN.LOST | Left ACM neighbour Segment n | The left configured neighbour is not responding. Either this neighbour has ACM disabled, has an termination configured which blocks communication or does not have its neighbour configured correctly. |
| Warning | CONN.LOST | Right ACM neighbour Segment n | The right configured neighbour is not responding. Either this neighbour has ACM disabled, has an termination configured which blocks communication or does not have its neighbour configured correctly. |
| Warning | STALL | Motor n | Motor n stalled because the speed reached below the bottom threshold. |
| Warning | LIFT ERROR | Lift appears to be jammed | The lift did not reach its end position within the time limit. |
| Warning | UPDATING | Emergency fail-safe DFU | The software of the fail-safe CPU is being updated. |
| Warning | VCC FAIL | Fail-safe MCU VCC failure | The fail-safe CPU was unable to determine a valid input voltage. |
| Warning | VCC FAIL | Unable to determine valid VCC | Unable to determine a valid input voltage, motors are de-energised. |

# 7 | DIRECT MOTOR CONTROL

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



## 7.1 Real-Time Ethernet or I/O Signals

The controller offers direct motor control using Real-Time Ethernet or the configurable I/O Both control methods offer the possibility to control motor Run, Direction and Speed.

## 7.2 Run control

Controlling the run can be done through Real-Time Ethernet or I/O This can be done by setting the Motor Run bit in the cyclic I/O Data.

| Run | Run roller |
|---|---|
| FALSE | Off |
| TRUE | Run |

## 7.3 Direction control

Controlling the direction can be done in the same way for both control methods. For Real-Time Ethernet this is done through setting the Motor Dir bit in the cyclic I/O Data. When using I/O signals this is done trhough configuring an configurable I/O with a Motor Dir function.

| Direction | Direction roller |
|---|---|
| INACTIVE/FALSE | Clockwise (CW) |
| ACTIVE/TRUE | Counter clockwise (CCW) |

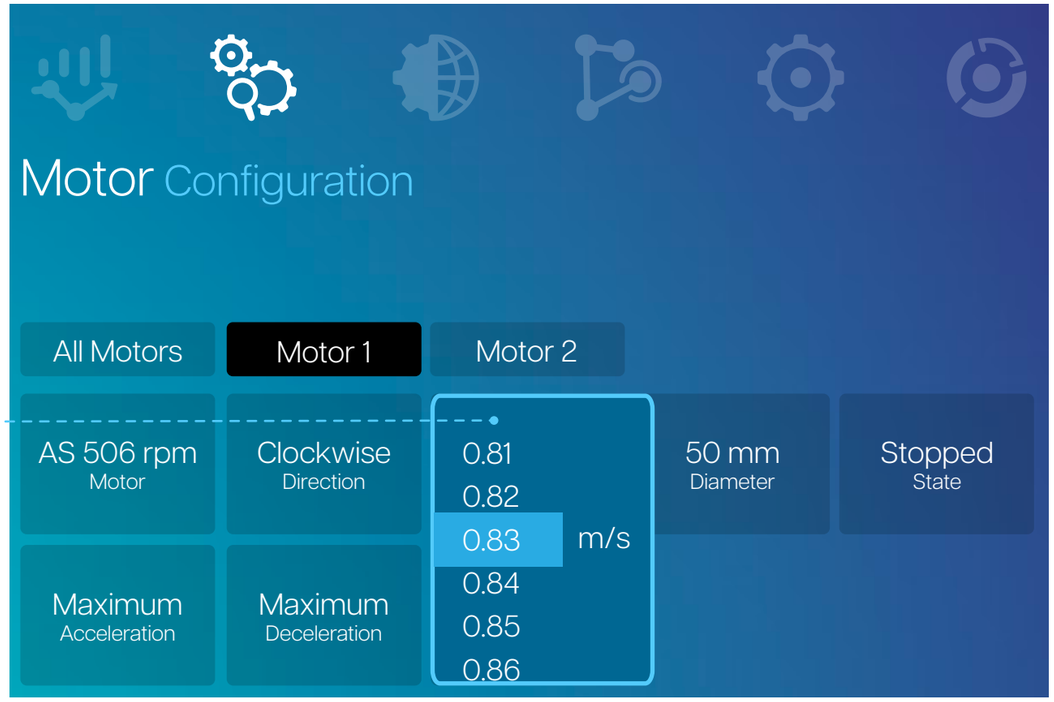
## 7.4 Speed control

When using Real-Time Ethenet, the speed can be changed using the Override Speed Value Word. The unit of the value in the data word is in cm/s.

During operation the speed can only be altered using Real-Time Ethernet. This can be done by changing the Override Speed Value Word. The unit of the value in the data word is in cm/s. The Override speed enable bit must be set high for this function to be active. When using I/O signals to directly control the motor, the speed which in configured in the menu will be used.

The default settings of these speed setpoints depend on the Motor Type and Diameter of the roller. The selectable speed ranges for the AS motors are shown below. All speed setpoints can be altered with a 0.01 m/s stepsize.

| Motor type | Selectable speed range (50mm diameter) |
|---|---|
| AS 172 rpm | 0.14 - 0.45 m/s |
| AS 507 rpm | 0.40 - 1.32 m/s |
| AS 1033 rpm | 0.81 - 2.70 m/s |



# 8 | REAL-TIME ETHERNET & CYCLICAL I/O DATA

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 8.1 Cyclical I/O Data

Cyclic Data is data that will be exchanged at every fixed interval. The cyclic data exists of input- and output data. Input data is transported from the AS controller to the PLC. Output data is transported from the PLC to the AS controller.

## 8.2 Input Data

| Category | Type | Name | Remark |
|---|---|---|---|
| Configurable I/O | Bool | Generic I/O 1 active | False = Inactive / True = Active |
| | Bool | Generic I/O 2 active | False = Inactive / True = Active |
| | Bool | Generic I/O 3 active | False = Inactive / True = Active |
| | Bool | Generic I/O 4 active | False = Inactive / True = Active |
| | Bool | Generic I/O 5 active | False = Inactive / True = Active |
| | Bool | Generic I/O 6 active | False = Inactive / True = Active |
| | Bool | Reserved | |
| | Bool | Reserved | |
| | | | |
| Motor 1 - 4 | Bool | Motor Running | False = Off / True = Running |
| | Bool | Motor Direction | False = CW / True = CCW |
| | Bool | Motor Error | False = No Error / True = Error |
| | Bool | ACM Segment Ready for Loading | True = Segment can start loading |
| | Bool | ACM Segment Ready for Dispatching | True = Segment can start dispatching |
| | Bool | ACM Segment Sensor Active | False = Inactive / True = Active |
| | Bool | ACM Error | False = No Error / True = Error |
| | Bool | ACM External Neighbour Connected | False = Disconnected |
| | Word | Set Speed (cm/s) | Current speed setpoint |
| | Word | Live Speed (cm/s) | Live motor speed |
| | Word | Live Current (mA) | Live motor current |
| | Word | Reserved | |
| | Word | Motor Runtime (s) | Cumulative runtime of motor |
| | Word | ACM State | See table for states |
| | Word | Status Code | See table for status codes |
| | Word | Reserved | |



## ACM States

| Value | Name | Description |
|---|---|---|
| 0 | DISABLED | ACM is disabled for this segment |
| 1 | INITIALIZING | The segment is initializing |
| 2 | EMPTY | The segment is empty and can receive a package |
| 3 | LOADING_START | The segment is waiting until the load start delay has been reached |
| 4 | LOADING_MOVE | The segment is moving until the sensor detects a package |
| 5 | LOADING_DISPATCHING | The segment is simultaneously loading and dispatching |
| 6 | LOADING_END | The segment has detected a package and will keep moving until the load end delay has been reached |
| 7 | LOAD_TIMEOUT | The segment did not detect a package while loading within the set load timeout |
| 8 | OCCUPIED | The segment has collected a package and is ready to transport to the next segment |
| 9 | DISPATCHING_MOVE | The segment is moving until the sensor does not detect a package |
| 10 | DISPATCHING_MOVE_SMOOTH | The segment is dispatching and can simultaneously start loading if the previous segment offers a package |
| 11 | DISPATCHING_END | The segment is moving for the set load end delay after the dispatching is done |
| 12 | DISPATCH_TIMEOUT | The segment did not detect that the package has been transported during dispatching within the set dispatch timeout |
| 13 | STALLED | The motor is physically stalled due to blockage |
| 14 | PRELOADING | Upstream segment is loading. Start the motor already to be in motion at the time the package arrives at this segment |
| 15 | FORCE_RUN | The segment is forced to run during train dispatch |

# 8 | REAL-TIME ETHERNET & CYCLICAL I/O DATA

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## Status Codes

| Value (Hex) | Name | Description |
|---|---|---|
| 0x0000 | OK | No error is present |
| 0x1000 | ACM_LOAD_TIMEOUT | The ACM segment has a load timeout |
| 0x1001 | ACM_DISPATCH_TIMEOUT | The ACM segment has a dispatch timeout |
| 0x1002 | ACM_NB_EXT_DISCONNECTED | The external ACM neighbour is disconnected |
| 0x1003 | ACM_NB_INT_DISCONNECTED | The internal ACM neighbour is disconnected |
| 0x1004 | ACM_MASTER_DISCONNECTED | The ACM master is not reachable |
| 0x2000 | MTR_STALL | The motor is stalled due to low speed |
| 0x2001 | MTR_OC | The motor is stalled due to overcurrent |
| 0x2002 | MTR_ERROR | The motor reports an error |
| 0xF000 | EMGR_STOP | The emergency stop is active |
| 0x3000 | OVP_OFFLINE | The emergency fail-safe chip is not responding |
| 0x3001 | OVP_DFU_FAIL | The software update for fail-safe chip failed to install |
| 0x3002 | OVP_EMRG_FAIL | The periodic safety test of fail-safe chip failed |
| 0x4000 | VCC_CHECK_FAIL | VCC is outside a valid range |

## 8.3 Output Data

| Category | Type | Name | Remark |
|---|---|---|---|
| Configurable IO | Bool | Activate Generic Output 1 | True = Activate / False = Deactivate |
| | Bool | Activate Generic Output 2 | True = Activate / False = Deactivate |
| | Bool | Activate Generic Output 3 | True = Activate / False = Deactivate |
| | Bool | Activate Generic Output 4 | True = Activate / False = Deactivate |
| | Bool | Activate Generic Output 5 | True = Activate / False = Deactivate |
| | Bool | Activate Generic Output 6 | True = Activate / False = Deactivate |
| | Bool | Reserved | |
| | Bool | Reserved | |
| | | | |
| Motor 1 - 4 | Bool | Motor Control Enable | True = Control Run and Direction |
| | Bool | Motor Run | False = Off / True = Run |
| | Bool | Motor Direction | False = CW / True = CCW |
| | Bool | Speed Override Enable | True = Control Speed |
| | Bool | ACM Load Segment | Rising edge = Start loading |
| | Bool | ACM Dispatch Segment | Rising edge = Start dispatching |
| | Bool | Reserved | |
| | Bool | Reserved | |
| | Byte | Reserved | |
| | Word | Override Speed Value (cm/s) | Override speed value to apply |
| | Word | Reserved | |

# 9 | PROTOCOL SPECIFIC INFORMATION

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 9.1 PROFINET

When commissioning PROFINET, the PLC saves a copy of the AS controller settings. When a connection is established, the settings are pushed to the device. All settings configurable in the engineering software (TIA Portal) are displayed below. Ensure these settings are configured correctly in the engineering software because they will overwrite the current settings in the AS controller.

### Settings

| Category | Setting |
|---|---|
| Device | IP-Address |
| | Netmask |
| | Gateway |
| Emergency | Emergency Detection |
| | Emergency 24V Power Left |
| | Emergency 24V Power Right |
| Configurable I/O 1 - 6 | Function |
| | Signal Type |
| | High / Low Active |
| Motor 1 - 4 | Motor Type |
| | Motor Diameter |
| | Motor Acceleration |
| | Motor Deceleration |
| | Sync Motor Behaviour |
| | Speed |
| | ACM Enable |
| | ACM Direction |
| | ACM Slave mode |
| | ACM Terminal Type |
| | ACM Run if Empty |
| | ACM Smoothing |
| | ACM Preloading |
| | ACM Train Dispatch |
| | ACM Load Start Delay |
| | ACM Load End Delay |
| | ACM Load Timeout |
| | ACM Dispatch End Delay |
| | ACM Dispatch Timeout |
| | ACM Sensor Hold |





## 9.2 Protocol specific LEDs

The device has two LEDs to signal the Real-Time Ethernet status. Both the ER/NS/BF and RN/MS/SF LEDs have a different meaning depending on the protocol used. The table below shows the signalling for PROFINET.

| RTE LEDs | Type |
|---|---|
| SF (System Failure) | |
| Off | No Error |
| Red, flashing 1Hz | DCP Signal service is initiated via the bus |
| Red | Watchdog timeout |
| | Channel, generic or extended diagnosis present |
| | System error |
| BF (Bus Failure) | |
| Off | No Error |
| Red, flashing 2Hz | No data exchange |
| Red | No configuration |
| | Low speed physical link |
| | No physical link |

# 10 | CONTROL HIERARCHY

2 | BLDC Motor

6 | I/O Config.

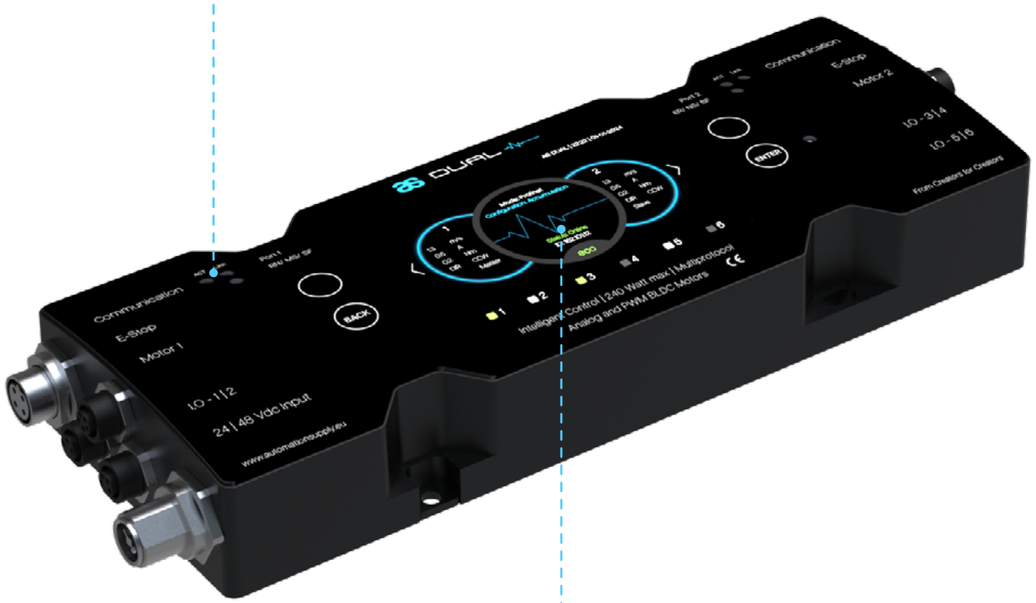
3.5 inch Display

Profinet TCP/IP Ethercat

24 V 240 Watt

48 V 300 Watt






## 1. ETHERNET

When the bit “MotorControlEnable” is set in the Real-Time Ethernet cyclical I/O data, the PLC always controls if the motor runs and its direction. This is done using the “MotorRun” and “MotorDirection” bits.
If the bit “SpeedOverrideEnable” is set in the cyclical I/O data, the PLC always controls the motor speed by setting the desired speed in the “OverrideSpeed” word.

## 2. CONFIGURABLE I/O

If the above is not applicable and at least one of the configurable I/Os has a Run function assigned to them, the motor run and speed will be controlled using I/O signals. If at least one of the configurable I/Os has a DIR function assigned to them, the motors direction will be controlled using an I/O signal.

## 3. ZERO PRESSURE ACCUMULATION

If none of the above is applicable and the “Accumulation” setting is enabled, the motor will be controlled by the internal Zero Pressure Accumulation logic. The motor speed and direction configured within the settings menu will be used. The ZPA process can be controlled and monitored trough I/O signals or Real-Time Ethernet communication.

## 4. GRAPHICAL USER INTERFACE

If none of the above is applicable, the motor can be controlled using the graphical interface and menu. The run, direction and speed settings in the menu will be used.

# 11 | ZERO PRESSURE ACCUMULATION

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 11.1 Working principle

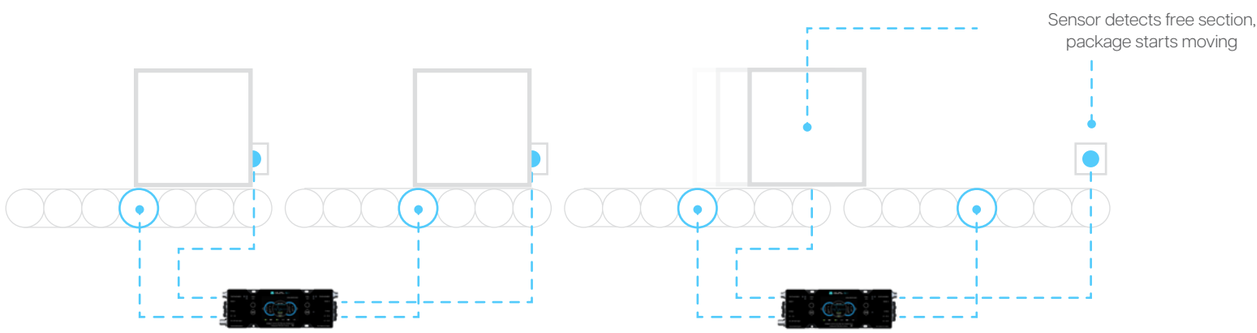
The ontroller can provide fully autonomous Zero Pressure Accumulation (ZPA) applications. This allows for transportation of goods without them coming into contact with each other. The conveyor system is divided into segments, each with a sensor, a roller, and several slave rollers. Since the controllers are directly communicating with each other, they know which segments have packages, which segments are loading packages and which are dispatching packages.

The system will automatically transfer packages segment by segment until the package cannot move any further. Each ZPA chain has a beginning and end, where an external part of the system is usually attached. Commands can be given to the first segment to start loading a package or to the last segment to start dispatching a package.

## 11.2 Setup

To use zero pressure accumulation, make sure the following points are configured correctly:

(1) The communication parameters are configured correctly in the COM menu. Check the ACM status LEDs to confirm communication is working
(2) Verify the motor is not controlled directly by Real-Time Ethernet or I/O
(3) Turn on the Accumulation setting.
(4) Each ZPA segment needs a sensor. Use the configurable I/O (CIO) menu to configure a sensor function. A sensor is not needed when slave mode is enabled for a segment.
(5) Configure the ACM Direction so it represents the downstream direction of packages.
(6) Ensure the Endpoint setting is configured to ZPA-first for the first segment and ZPA-last for the last segment in the ZPA chain.








## 11.3 Monitoring

It is possible to monitor the ZPA process through configurable I/O or Real-Time Ethernet. Monitoring is usually only needed for the first and last segment in the ZPA chain since they are the interface to other parts of the system. However, segments in between can be monitored as well.

Generally, the following data is available through both RTE and I/O:
- Sensor Status
- Segment ready for loading
- Segment ready for dispatching
- Timeout error

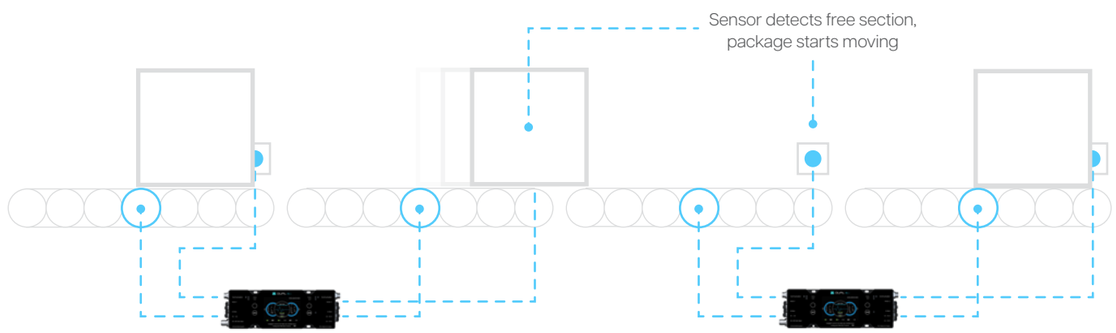
## 11.4 Control

It is possible to control the ZPA process through configurable I/O or Real-Time Ethernet. Controlling is only needed for the first and last segment in the ZPA chain since they are the interface to other parts of the system.

A load command can be given when a segment is in the empty state. The segment will run until a package is detected at its sensor. A loading timeout error will be thrown when no package is detected and the timeout has been reached.

When a segment is in the occupied state, a dispatching command can be given. The segment will run until the package is not detected anymore. A dispatching timeout error will be thrown when the package is still detected and the timeout has been reached.

The loading and dispatching commands only make sense being executed by a ZPA-first or ZPA-last segment. The segments in between will automatically transport the package. If a load or dispatch command is given through configurable I/O to a segment in between, the command will be transported in the correct direction. This is upstream for a load command and downstream for a dispatch command.



# 12 | SETTINGS & CONTROLS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



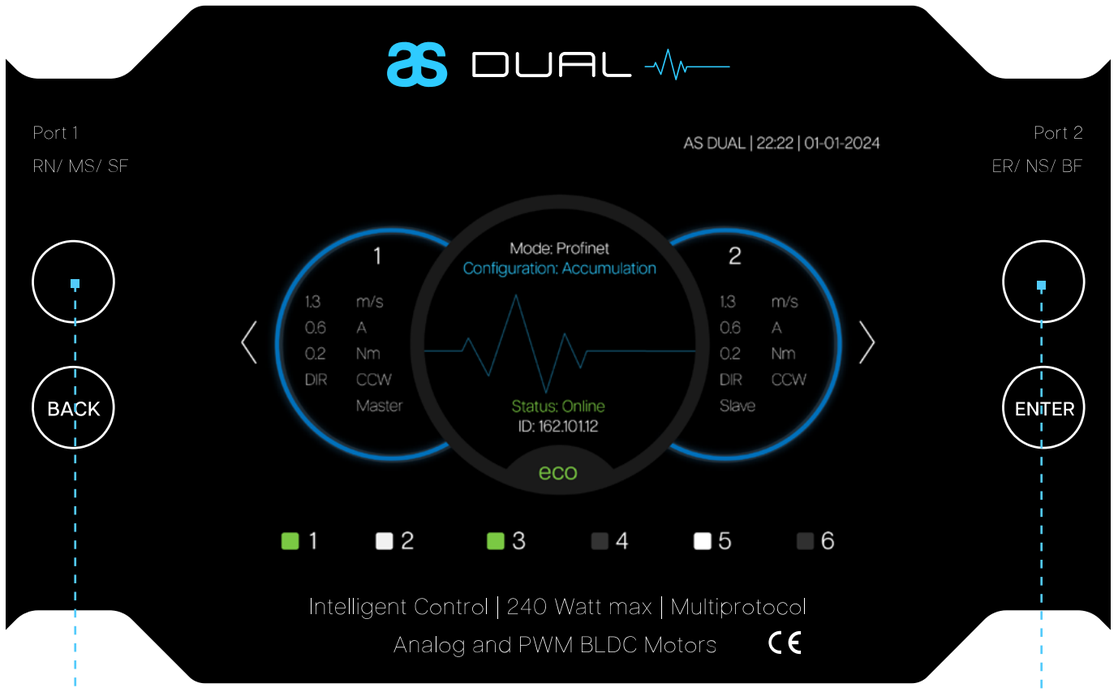
## 12.1 Dashboard Functionalities

AS DUAL | ASD2448 Dual Motor Controller

### Information and core parameters

The dashboard creates an overview of the most important parameters and statuses. For each motor, the live status, current usage, power mode, torque and direction can be seen. If the motor is running, the circle will rotate with the correct speed and in the correct direction.

The middle circle represents the communication status. Here the IP-Address and current control method can be seen, as well as the communication status. At the bottom of the screen you can see the status of each configurable I/O, this can be either disabled, active or inactive. In the top right corner the current date and time can be observed.




### Live status definitions

The table show the definition of the live status of the controller and motor.

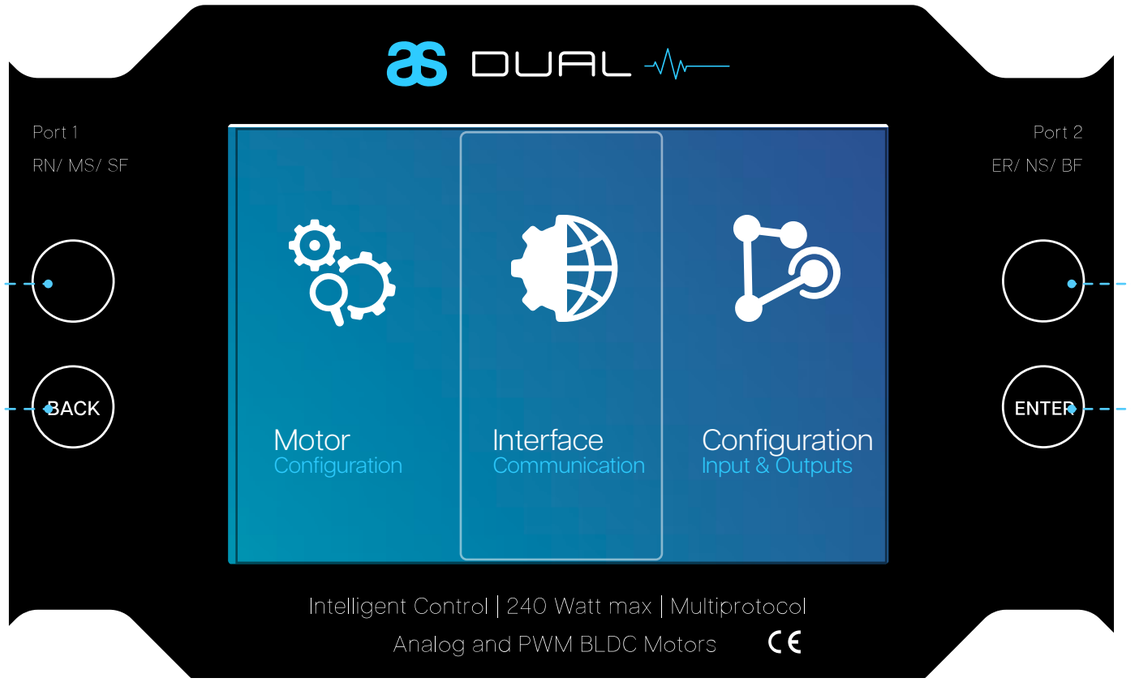
| Parameter | Description |
|---|---|
| *Motor Specific* | |
| Speed / State | Live speed in m/s if the motor is running, otherwise either Stopped, Error or Stalled |
| Current | Live current in A |
| Torque | Live torque in Nm |
| Direction | Current direction of the motor |
| Power Mode | Active configured power mode, either ECO or BOOST |
| | |
| *Communication* | |
| IP-Address | Current configured IP-Address of the device |
| Comm. Status | Current communication status, either online, fieldbus offline or neighbor offline |
| Heartbeat | Heartbeat animation when the device is online, otherwise a flatline will be visible |
| Control Method | The current active control method, this can be either Fieldbus, ACM, I/O or menu |
| | |
| *Configurable I/O* | |
| I/O Status | Each I/O can either be disabled (grey), inactive (white) or active (green) |
| | |
| Date & Time | The top-right corner of the screen will display the configured date and time |
| | |

# 12 | SETTINGS & CONTROLS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 12.2 Main Menu

AS DUAL | ASD2448 Dual Motor Controller




### How to navigate through the main menu

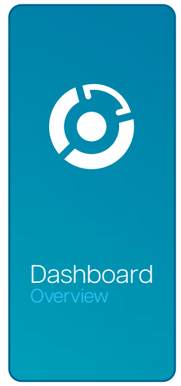
The main menu consists of six main categories., which are explained on the next page. Use the left and right button to navigate through the categories and click the enter button to enter the selected category and go a layer down into the menu. Click the back button to go one layer up in the menu.





### Dashboard

The dashboard shows the live status of the motors, control method, communication status and configurable I/O Based on the installed firmware the Dashboard can display different data and images.

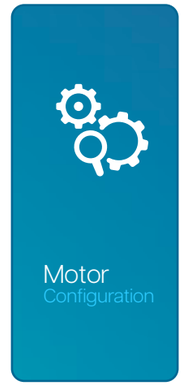



### Motor

Configuration

The motor menu contains the core parameters that can be set for the best performance, such as:

- Motor Type
- Direction and Speed
- Acceleration and Deceleration
- Boost or Eco mode




### Interface

Communication

The interface menu consists of multiple settings categories. The following categories are available:

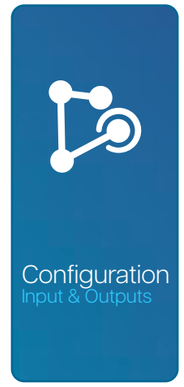
- Emergency Stop
- Zero Pressure Accumulation
- ZPA Timings
- Advanced motor settings


### Configuration

Inputs & Outputs

The configuration menu can be used to configure the six configurable I/Os. The following parameters can be set:

- CIO Function
- CIO High / Low Active
- CIO Input Type PNP / NPN

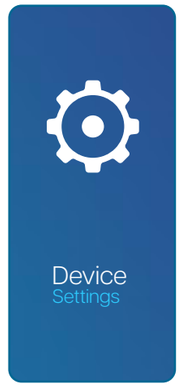



### Device

Settings

The device menu contains the device specific settings which are not associated with a motor or segment.

- Installed firmware
- Communication parameters
- Device preferences




### Analytics

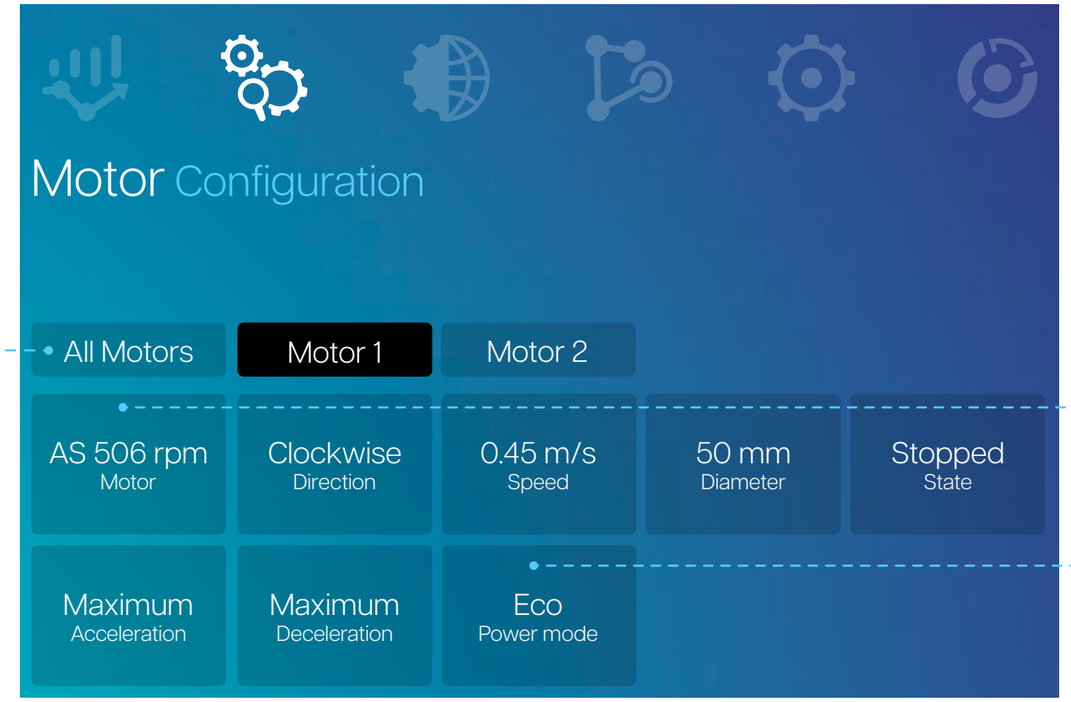
Performance

The AS Dual Controller has many data points that can be stored in order to facilitate functions such:

- Energy efficiency
- Preventive maintenance
- Optimization

## 12.3 Motor Configuration

AS DUAL | ASD2448 Dual Motor Controller




### How to navigate through the motor configuration menu

All settings shown can be configured individually for each motor. To view the settings of a specific motor, select this motor in the selection bar. Once a motor is selected, it turns black. To reach the settings keep pressing the left or right button, after the last motor is highlighted it will automatically go down to the settings. Additionally, settings can be changed for multiple motors at the same time. To accomplish this, select multiple motors in the selection bar and change a setting.

### Motor type

By default the motor is disabled. To enable a motor, select the correct motor type in this setting. The following motor types are supported.

| Supported Motors | | |
|---|---|---|
| **Automation Supply** | **Interroll** | **Itoh Denki** |
| AS 172 rpm | IR EC5000 108:1 | ID XE/XP 17 |
| AS 506 rpm | IR EC5000 78:1 | ID XE/XP 30 |
| AS 1033 rpm | IR EC5000 49:1 | ID XE/XP 60 |
| | IR EC5000 42:1 | ID XE/XP 100 |
| | IR EC5000 21:1 | |
| | IR EC5000 18:1 | |
| | IR EC5000 13:1 | |
| | IR EC5000 9:1 | |

### Other parameters

For a overview of the other available parameters, please see the table below.

| Parameter | Description |
|---|---|
| Direction | The direction of the motor: Clockwise (CW) or Counter Clockwise (CCW). |
| Speed | The motor speed in steps of 0.01 m/s. The range depends on motor type and diameter. |
| Diameter | The motor diameter can be configured between 30mm and 250mm. |
| Run State | The motor can be stopped or running. This setting will be overridden by Fieldbus, I/O or ACM |
| Acceleration | Acceleration of the motor from 0.1 to 4.0 $m/s^2$ or maximum. |
| Deceleration | Deceleration of the motor from 0.1 to 4.0 $m/s^2$ or maximum. |
| Power Mode | Both Eco and Boost are avialable. In boost mode the motor will not be restarined. |

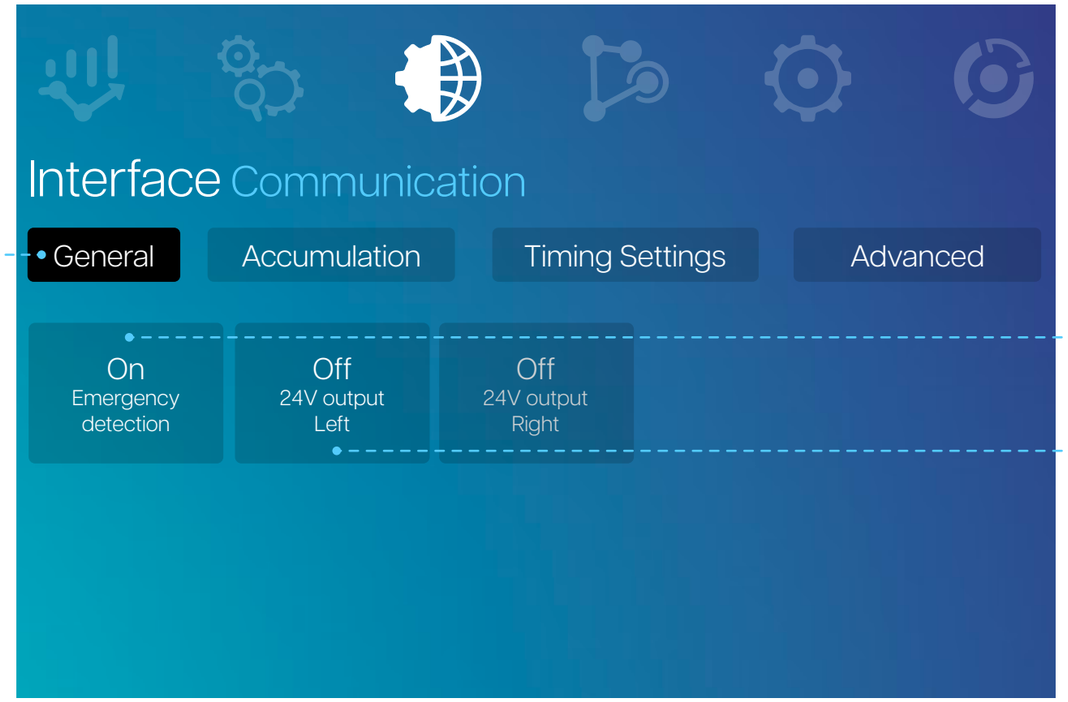
## 12.4 Interface Communication

AS DUAL | ASD2448 Dual Motor Controller

### How to navigate through the Interface menu

The Interface menu has an extra selection bar where different types of settings can be selected. The general tab contains the emergency stop settings, these settings are not configurable per motor.

The Accumulation and Timing Setings tabs contain the Zero Pressure Accumulation (ZPA) settings which can be configured per segment. The advanced tab contains advanced motor settings which can be configured per motor, these include stall settings and current limit. The layers in the menu can be navigated through the back and enter buttons.




### Emergency detection

The controller has an emergency stop function which is enabled by default. This function requires 24V at the signal pin of at least one of both E-Stop connectors so it can enable the power to the motors. If the 24V signal is removed, the power to all motors is also cut by hardware while keeping the controller powered.

The controller can detect this and will show an error on the screen. If the E-Stop function is not used, it should be disabled by turning this setting off. Turning this setting off will override the emergency function so the motors are always powered.

### 24V output Left / Right

The controller has two E-Stop connectors, one on each side. Both connectors feature a 24V supply pin to easily attach a safety device, for instance an emergency stop button. The 24V on this pin is turned off by default. If needed, these can be turned on individually for the left or right side.

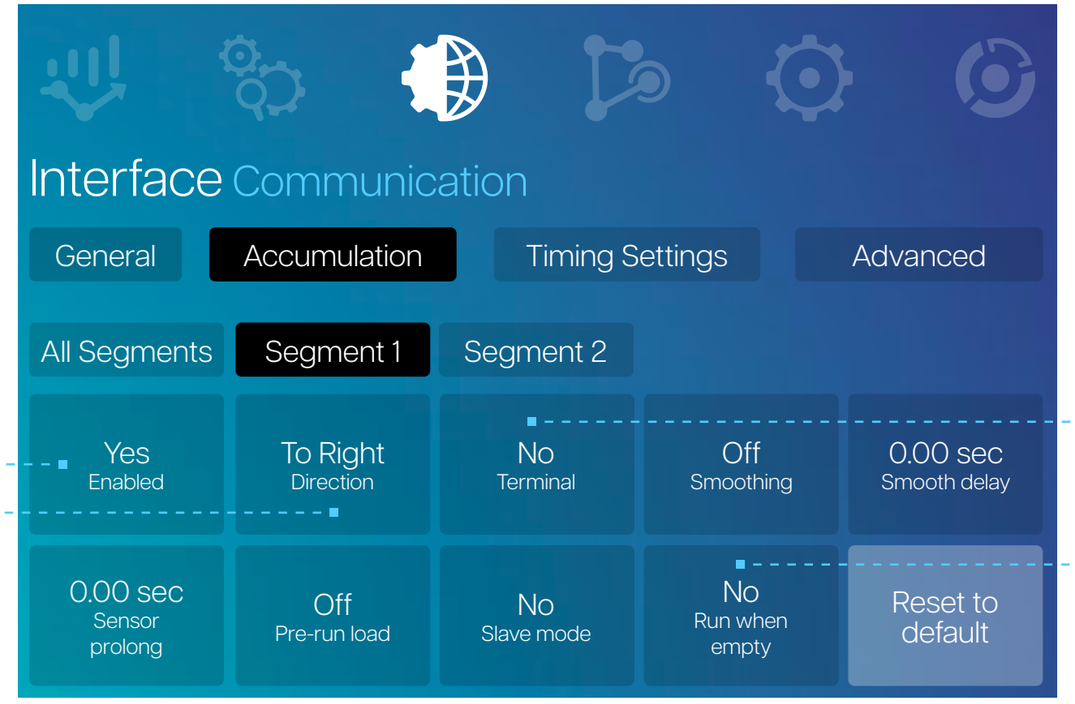
# 12 | SETTINGS & CONTROLS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



## Interface Communication

AS DUAL | ASD2448 Dual Motor Controller




### Accumulation

This function controls the the Zero Pressure Accumulation (ZPA) logic. Enabling this setting wil cause the motor to not use the "Run State" setting in the motor menu. If accumulation is disabled, all other settings in the Accumulation and Timing Settings categories cannot be changed.

### Direction

This is the transportation direction of the package. When configured "To Right", the controller will accept packages from its left neighbor, then it will transport packages to its own segments in ascending order. Once the last internal segment has been reached, the control will continue the transport to its right neighbor. If the "To Left" setting is configured, this sequence will be the exact opposite.

### Terminal

Specify if the segment is the beginning or end of a chain of segments. The first segment in the chain should be configured as "First", whereas the last segment should be configured as "Last".

### Smoothing

Traditionally, the ZPA logic will wait before a segment is completely empty before loading a second package. With smoothing enabled, a segment is allowed to simultanously load and dispatch a package. This will result in more smooth transport. However, it can be more prone to errors since the segment is performing two actions at the same time.

### Other parameters

For a overview of the other available parameters, please see the table below.

| Parameter | Description |
|---|---|
| Smooth delay | The smooth delay is the time a package waits before it is released. Creates a staggered start. |
| Sensor prolong | This setting can reduce the bouncing effect of a the segment sensor, used to detect the presence of packages. It extends the "HIGH" state of the sensor but not the "LOW" state. |
| Pre-run load | Enable this setting to already start the motor in a segment once its upstream neighbouring segment starts loading. |
| Slave mode | A segment with slave mode enabled will copy the exact behaviour of its downstream neighbour. |
| Run when empty | If this setting is enabled, the segment will also run in the empty state. |

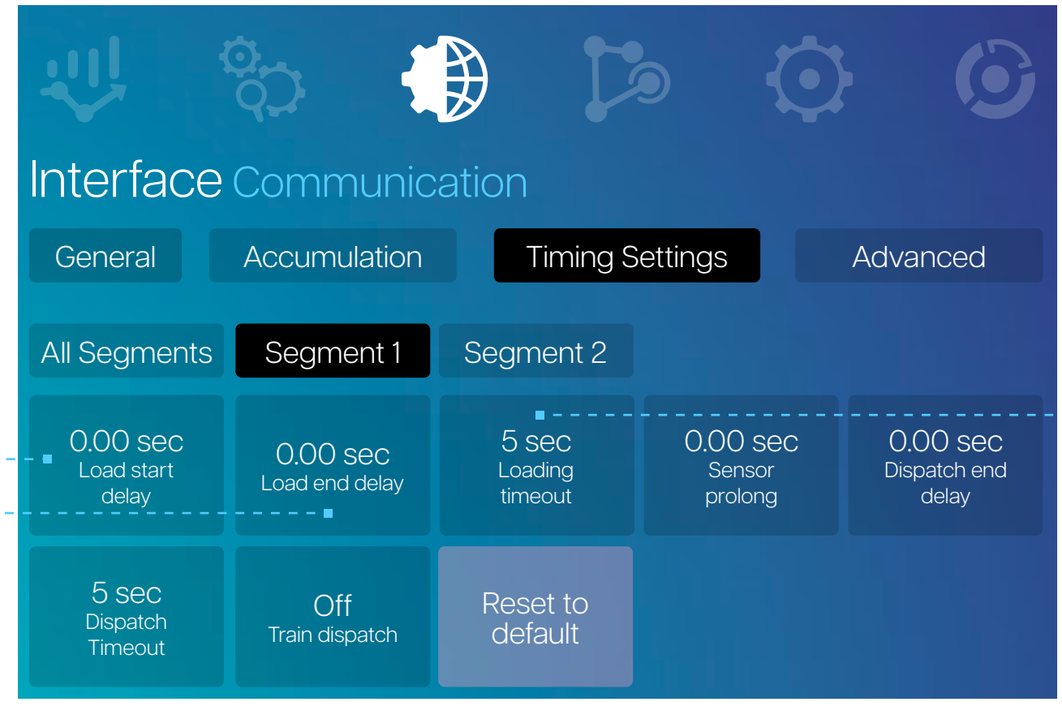
# 12 | SETTINGS & CONTROLS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



## Interface Communication

AS DUAL | ASD2448 Dual Motor Controller




### Load start delay

The time window a segment should wait before starting to load. This setting will reduce the gap between parcels as the previous segment will start moving earlier.

### Load end delay

The time window a segment keeps moving after a package has been detected. This setting will make the package stop further than the sensor position. Consider that the package must not move past the sensor in this timeframe, otherwise the controller will lose track of the package.

### Loading timeout

This is the maximum time a loading action is allowed to take. If the loading has not been completed within this time, the segment will stop and an loading timeout error will be visible on the screen. This error will be automatically reset after 5 seconds.

### Sensor prolong

This setting can reduce the bouncing effect of a the segment sensor, used to detect the presence of packages. It extends the "HIGH" state of the sensor but not the "LOW" state.

### Dispatch end delay

The time window a segment keeps moving after a package has been succesfully tranpsorted to the next neighbour. This setting ensure the package has fully left the segment, even if the sensor is not placed at the end.

### Dispatch timeout

This is the maximum time a dispatching action is allowed to take. If the dispatching has not been completed within this time, the segment will stop and an dispatch timeout error will be visible on the screen. This error will be automatically reset after 5 seconds.

### Train dispatch

A segment and all adjacent upstream segments with this setting enabled will start running simultanously once the last segment is ordered to dispatch using Fieldbus or I/O The motors will keep running until the command is released.

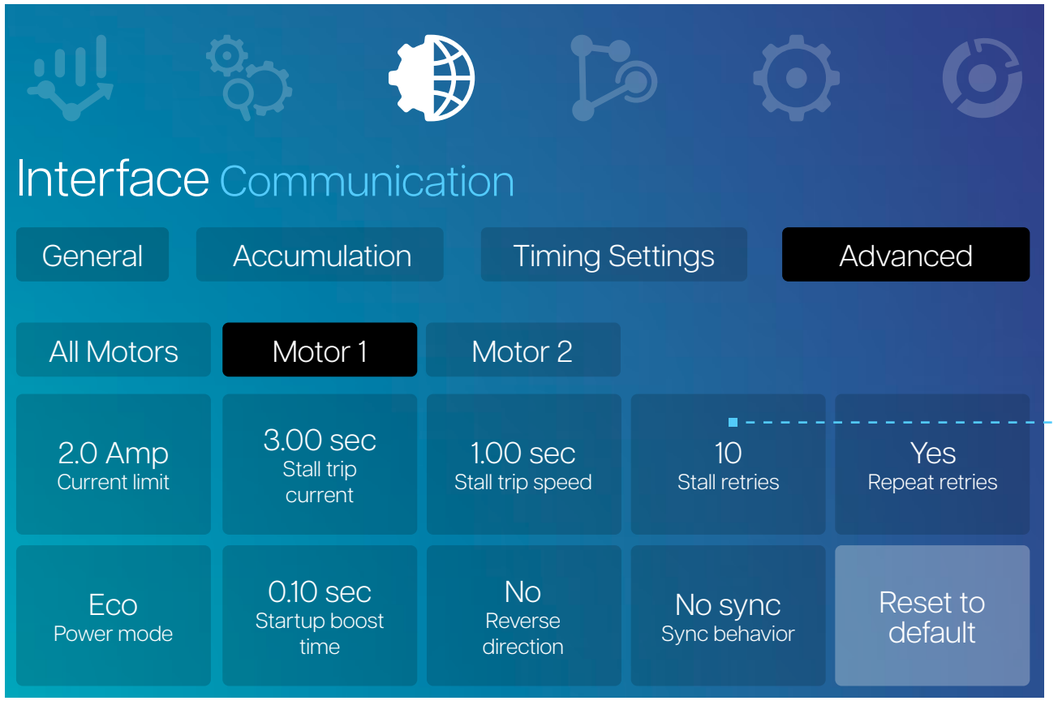
# 12 | SETTINGS & CONTROLS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



## Interface Communication

AS DUAL | ASD2448 Dual Motor Controller

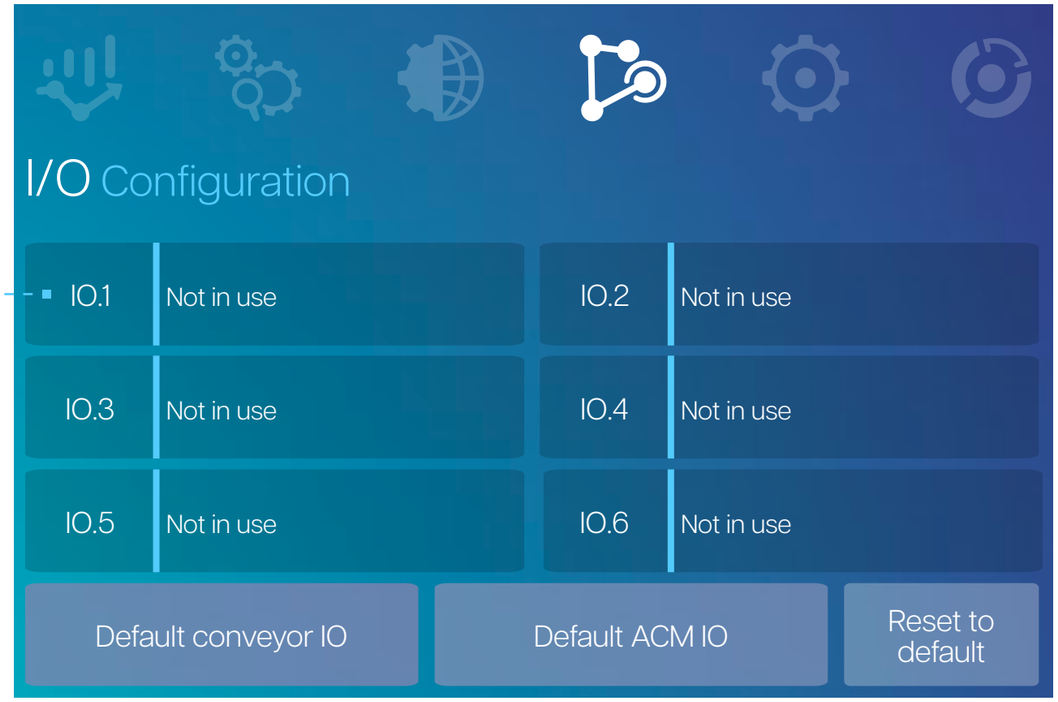



## Advanced parameters

| Parameter | Description |
|---|---|
| Current limit | Current limit used in ECO power mode as well as detecting a stall based on current. |
| Stall trip current | Time windows the motor must be drawing too much current to enter a current stall, |
| Stall trip speed | Time window in which the motor must be moving at a very low speed to enter a speed stall. |
| Stall retries | Number of times that a motor retires after a stall. The counter will be reset once the motor does not detect a stall for twice the time window. |
| Repeat retries | If enabled and the motor stall retries have been reached, the motor will retry after 60 seconds. |
| Startup boost time | After the motor starts, allow maximum current for this time window to ensure the motor is able to start correctly. |
| Reverse direction | If enabled, this setting will ensure the direction of the motor is flipped. This can be convenient when a single motor needs to be installed the other way around. |
| Sync behavior | If enabled, this setting will send motor control changes to its neighbor to the left or right. |

## 12.5 I/O Configuration

AS DUAL | ASD2448 Dual Motor Controller




### Configurable I/Os

By pressing enter on a highlighted configurable I/O the menu will open to configure the I/O option. Unlike other settings, all four aspects must be set before the I/O is correctly configured. The following parameters must be set in this order:

### CIO Type

The type can be either Input or Output. If "Not in use" is selected, the I/O will be disabled. For all options available, refer to the table on the next page.

### CIO Function

The function associated with the I/O must be chosen, the available options depend on the choice for Input or Output in the previous step.

### CIO Active

This is the state the I/O is considered active, this can be either "HIGH" or "LOW".

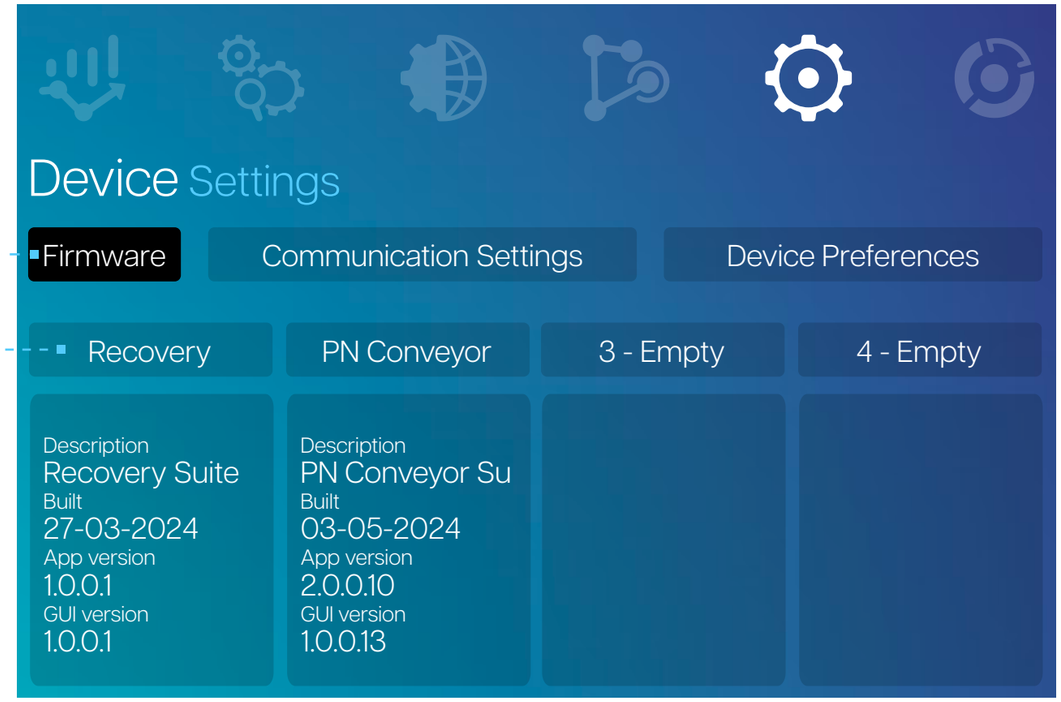
### Signal Type

At last, either PNP or NPN can be chosen depending on the connected device. This is only applicable if the I/O is used as an input.

| Function | Type | Description |
|---|---|---|
| Generic Input | Input | This input can be read using the Fieldbus |
| Motor 1-4 Run | Input | If this input is active, the motor will start running |
| Motor 1-4 Dir | Input | If this input is active, the motor will run CW, otherwise CCW |
| Segment 1-4 Sensor | Input | Segment sensor for the ACM logic |
| Segment 1-4 Load Trigger | Input | If this input is active, the segment will start loading if it is empty |
| Segment 1-4 Dispatch Trigger | Input | If this input is active, the segment will start dispatching if it is occupied |
| | | |
| Generic Output | Output | This output can be read and controlled by the Fieldbus |
| Any Error | Output | If any segment or motor has an error, this output will become active |
| Motor 1-4 Running | Output | If the motor is running, this output will become active |
| Segment 1-4 Occupied | Output | If the segment is occupied, this output will become active |
| Segment 1-4 Empty | Output | If the segment is empty, this output will become active |
| Segment 1-4 Error | Output | If the segment has a loading or dispatch timeout, this output will become active |
| Motor 1-4 Error | Output | If the motor has an error, this output will become active. |
| Segment 1-4 or Motor 1-4 Error | Output | If this segment or the motor of this segment has an error, this output will become active |

## 12.6 Device Settings

AS DUAL | ASD2448 Dual Motor Controller

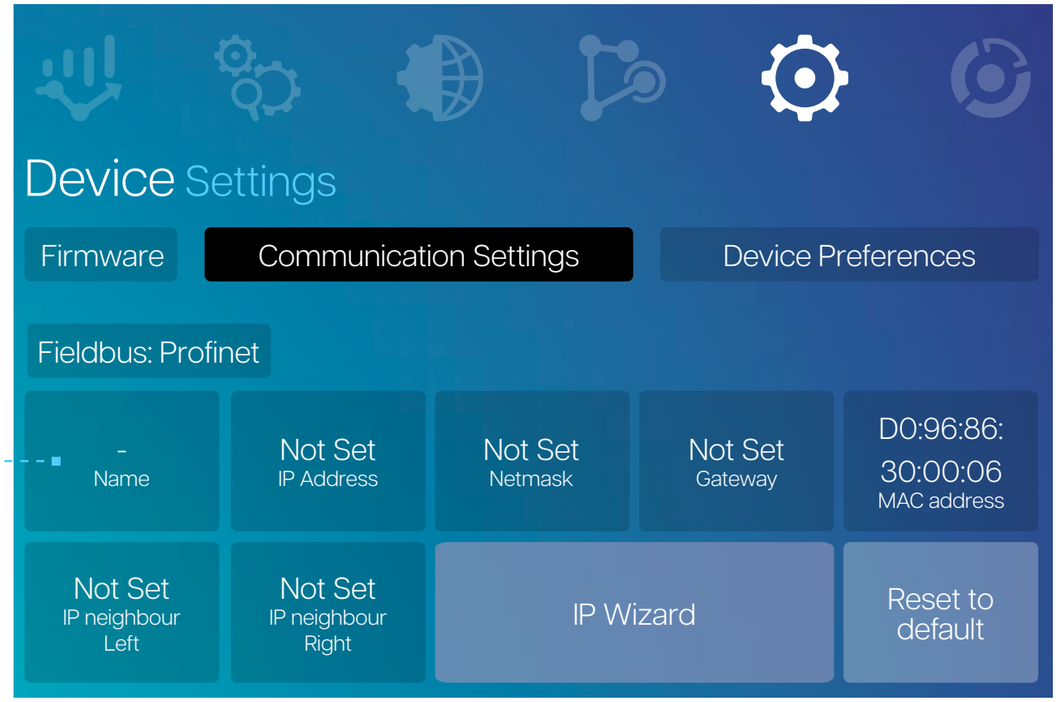



### Firmware

In the firmware menu, an overview of all available firmware can be seen. The device has four slots available. The firmware can be installed by highlighting it and clicking enter.

### Recovery Firmware

Recovery firmware is always pre-installed. This firmware can also be re-installed by holding down the enter button while the controller is powered on. This can fix the device in a case of corrupt or faulty firmware.




### Name

Each device can be given a name using the configuration tool. This setting will display the assigned name.

### IP Address / Netmask / Gateway

The device needs an IP address to be able to communicate to its neighbours. In this menu, the IP Address, netmask and gateway can be set.

### Neighbour IPs

The IP address of a connected neighbour must be known to the controller. These settings can be used to manually change the IP address of the left or right neighbour.

### IP Wizard

To ease the IP configuration of long chains of conveyor, an IP wizard is present. Using this method the following parameters can be quickly configured for all controllers in a chain: IP Addres / Netmask / Gateway, neighbour IP Adresses, ACM Direction

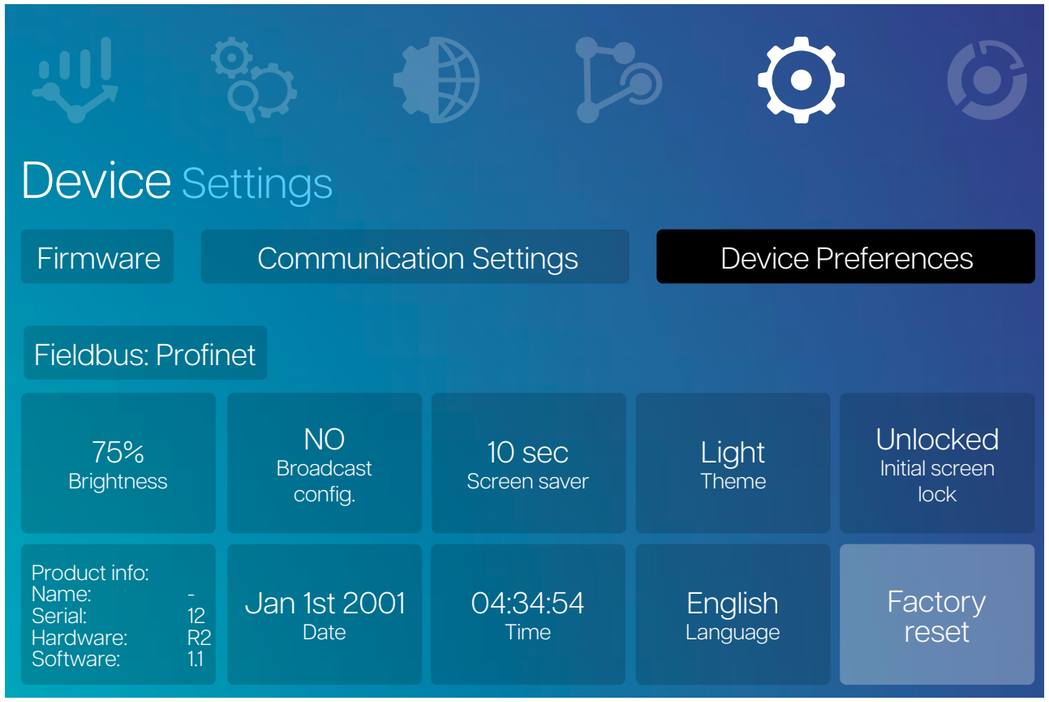
# 12 | SETTINGS & CONTROLS

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt



## Device Settings

AS DUAL | ASD2448 Dual Motor Controller




## Preferences

| Parameter | Description |
|---|---|
| Brightness | The screen brightness can be configured between 20% and 100%. |
| Broadcast config | If enabled, setting changes will be broadcasted to all controllers in the network |
| Sreen saver | After this time window without any button presses or warnings/errors, the screen will go dark |
| Theme | A light and dark themer are available. |
| Initial screen lock | Screen lock state which will be applied on startup. |
| Date / time | The date can be changed using these settings. |
| Language | Currently, only english is supported |

## 12.7 Analytics Performance

AS DUAL | ASD2448 Dual Motor Controller

### Data storage for the future

The AS Dual controller saves a number of data sets in order to generate relevant insight in:

1. Performance
2. Preventive Maintenance
3. Optimization

# 13 | EXAMPLE APPLICATION

2 | BLDC Motor

6 | I/O Config.

3.5 inch Display

Profinet TCP/IP Ethercat

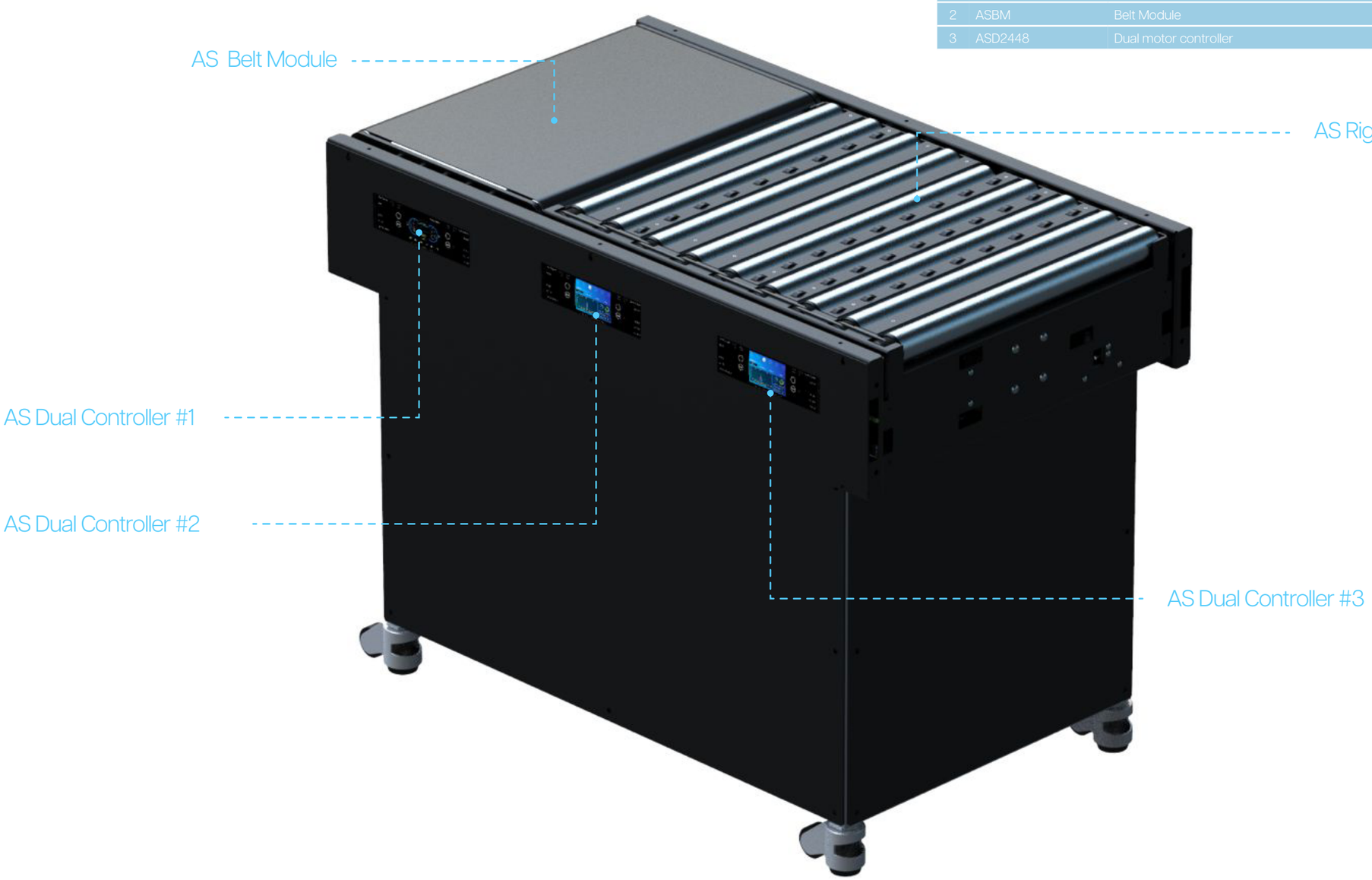
24 V 240 Watt

48 V 300 Watt



## 13.1 Portable Right Angle Sorter

The AS Dual Motor Controller can be used for almost any application in the field of automation and intralogistics.




## 13.2 Required Components and Modules

| | | Information | Specifications |
|---|---|---|---|
| 1 | ASRA | Right Angle Sorter | Sorts up to 1.240 Packages per hour @ 35 kg |
| 2 | ASBM | Belt Module | Transport weights up to 35 kg @ 1.25 m/s |
| 3 | ASD2448 | Dual motor controller | 2x motor \| 6x I/O \| 1x Power in \| 2x Emergency |



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# 14 | WARRANTY

2 | BLDC Motor | 6 | I/O Config. | 3.5 inch Display | Profinet TCP/IP Ethercat | 24 V 240 Watt | 48 V 300 Watt

## 14.1 Standard warranty

Automation Supply products are provided with a warranty period of 6 months after delivery.

## 14.2 Void warranty

Automation Supply products are not subjected to warranty if:

1. The product manual has not been consulted prior to using the product
2. The product has been opened or damaged
3. The product has not been purchased from Automation Supply and/or her partners
4. The product has been used for other purposes than described in the manual



# 15 | REMOVAL & DISPOSAL



## 15.1 Removal

Beware of the risk of injuries while removing the AS Dual controller from the conveyor system. Only authorized and qualified personnel is allowed to perform these kinds of tasks. Ensure the power is switched off and cannot be accidentally switched on again during removal. When removing the controller from the conveyor system, make sure the following tasks are being executed in this specific order:

1. Cut all power from the system or, if applicable, the specific segment.
2. If necessary, label the cables in order to ensure they are put back in the right place.
3. Disconnect all the cables from the controller.
4. Remove the mounting screws that secure the controller to the conveyor system.
5. Gently remove the controller. Make sure not to drop or bump it, as this might result in irreversible damage.
6. Make sure any loose cables are off the floor and cannot be damaged by accident.

## 15.2 Disposal

The disposal of the AS Dual controller must be compliant to industry-specific national and local provisions. The responsibility for the right disposal of the AS Dual controller and the accompanying packaging and accessories lies completely with the industrial operator which should consider the proper regulations surrounding the disposal of electronic devices.

# 16 | DECLARATION OF CONFORMITY

## EU Declaration of conformity

The manufacturer: **Automation Supply (EPHI BV)**

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Web **www.automationsupply.eu**

Hereby declare that the following product:

**AS Dual Controller**

is in conformity with the following standards and/ or other normative documents:

**2014/30/EU - EMC Directive**

Furthermore if relevant, the following harmonized standards are used:

**EN 61010-1:2010 - Safety requirements for control equipment**
**EN 61800-3:2018 - Adjustable speed electrical power drive systems - EMC requirements**

**Eindhoven, 01-03-2024**

M.P Karapun
Managing Director

T. de Kok
Operations Manager