

Features

- Protocol – EtherCAT
- Communication speed –100 Mbps
- Interface Capacity – up to 2 sensors/ 2 Senergy-Ai motors
- 2 motor interfaces include these features:
 - Bi-directional driving of brushless DC Rollers
 - Motor error detection (overload, overheat, short-circuit, motor not present)
 - Motor Servo control



Introduction

MotionLinx-Ai provides integrated control solution for conveyor and motor control applications with industrial protocol EtherCAT. The module is EtherCAT slave and exchange information with the master, concerning motor control, servo commands, sensors and diagnostics. The benefits of such a conveyor system include:

- Real time communication with cycle times <math>< 100 \mu\text{s}</math>
- Easy way to configure the EtherCAT slaves
- Simple system maintenance

EtherCAT is a highly flexible Ethernet network protocol, a unique principle called “processing on the fly” gives EtherCAT a handful of unique advantages. Because EtherCAT messages are passed before being processed in each node, EtherCAT operates at a high speed and efficiency. The process also creates flexibility in topology and incredible synchronization. MotionLinx-Ai uses CANopen over EtherCAT implementation. EtherCAT can provide the same communication mechanisms as CANopen: object dictionary, PDO (process data objects) and SDO (service data objects).

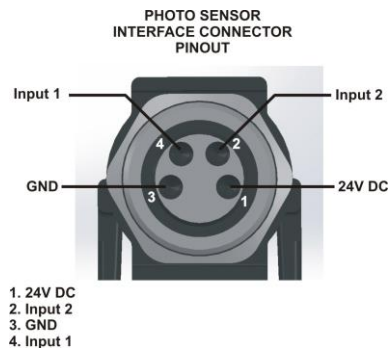
General Specifications

- Separate logic and motor power supplies
- Power requirement:
 - Logic: 18V-30V/ 120mA
 - Motor: 18V-30V/ 10A (16A peak)
 - Power conductors – 0,2- 2,5mm² (28-12AWG)
- Operating temperature: -10°C (-35°C) ~ +50°C
- Storage temperature: -40°C ~ +85°C
- Protection – IP54
- Dimension: 175mm (200mm mounting holes) x 56mm x 30mm

Connectors

Sensor connectors

- Number of inputs:
 - 2 M8 female connectors - 4 inputs
- PNP/NPN/Push-Pull Sensors



Motor connectors – 2 M8 male connectors

- Number of motors :
 - 2 Senergy-Ai motors – ECO or BOOST mode
 - Overload, overheat, overvoltage, short-circuit protection
 - Extended Motor Diagnostics/Maintenance Data

Network connectors – 2 RJ45

- Number of ports :
 - Port A and Port B

MotionLinx-Ai Process Data

The process data during each cycle (Process Data Objects, PDOs) is user data between master (Beckhoff TwinCAT) and slave.

PDOs from slave to master

TxPDO0

- All Sensors - INT
- Servo State Left Motor - SINT
- Servo State Right Motor - SINT
- Servo Position Left Motor - INT
- Servo Position Right Motor - INT

TxPDO1

- Module Diagnostic Left Zone - INT
- Module Diagnostic Right Zone - INT

PDOs from master to slave

RxPDO0

- Motor Control Left Zone - SINT
- Motor Control Right Zone - SINT
- Motor Speed Left Zone - INT
- Motor Speed Right Zone - INT
- Brake Mode Left Zone - SINT
- Brake Mode Right Zone - SINT

RxPDO1

- Motor Acceleration Left Zone - INT
- Motor Deceleration Left Zone - INT
- Motor Acceleration Right Zone - INT
- Motor Deceleration Right Zone - INT

RxPDO2

- Servo Control - INT
- Set Motor Servo Left Zone - INT
- Set Motor Servo Right Zone - INT
- Future Use - INT

MotionLinx-Ai Start-Up Configuration

Before going in Operational Mode master writes to manufacturer specific object to configure the slave via SDO (Service Data Object).

Configuration SDO

- Sensor Polarity - INT
- Set Push/Pull Sensor - INT
- Motor Type Left Zone - INT
- Motor Type Right Zone - INT
- Brake Mode Left Zone - INT
- Brake Mode Right Zone - INT
- Motor Speed Left Zone - INT
- Motor Speed Right Zone - INT

Additional Motor Data

Another manufacturer specific objects contain Motor Diagnostics/Maintenance Data for each motor (left and right). The objects are accessible through SDO.

Motor Data SDO

- Product - INT
- Customer ID - SINT
- Roller Type - SINT
- Motor Type - SINT
- Motor Tube Diameter - SINT
- Gearbox - SINT
- Interlock - SINT
- Month - SINT
- Year - SINT
- Shaft - SINT
- Tube Material - SINT
- Motor Length - INT
- Day - SINT
- Assembly Country - SINT
- Time - DINT
- Time Current Limit - DINT
- Time Overheat - DINT
- On/Off Cycles - DINT
- Overvoltage Counter - DINT
- Undervoltage Counter - DINT

MotionLinx-Ai Terminals assignment and LEDs

