wenglorMEL

# OPT3051/3052/3053

## Identifier Decoder for Logistic Control Systems


# Operating Instructions

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## Connection Types:

OPT3051 – Parallel version:


28 pin circular male connector
(see section 6.2)

OPT3052 – Profibus version


9 pin circular male connector
(see section 7.8.3)

OPT3053 – Profibus version with built-in profibus:


M12 connectors, 4 and 5 pins
(see section 7.9.1)

## Table of Contents

# 1. Introduction

The OPT305x identifier decoder is used in identification systems for logistic operation of carriers in the vast field of workpiece conveyance.
Specially coded rakes are attached to the workpiece carrier or to the conveyor train. Whenever a code rake has passed the identifier decoder, the respective code is detected by 4 optical sensors inside the sensor fork and it is sent to the PLC.
The recognition of the code rakes is independent of the moving direction, i.e. the code rakes can pass the decoders forward and backward, though the installation instructions must be considered (see section 4).
The recognition is not impaired by swinging movements or extreme speed changes.
The optical sensors are equipped with an early warning system for contamination (see section 2.3). At about 80% of contamination level the decoder first transmits data of the identified rake, followed by the error word and then a corresponding alert code (see section 8.1). Also in this case the error code can be ignored. In the case of a too high contamination a correct function is no longer ensured.

**Connection types:**
The parallel interface can be connected directly to a host computer parallel input operating with +24 V logic levels (see section 6).
The profibus version transmits the input from the PLC and output of the identifier decoder according to the profibus standard 1:1. The profibus models are available in different versions (see section 7).

# 2. Functional Description

## 2.1. Functional Description at Normal Operation

When a rake passes the sensor fork, all outputs (D0..D10, Strobe; 13 bit version: D0..D12, Strobe) are set to 0 V. After a rake has completely passed the decoder, data ( that means the code of the rake) is set as binary code to the outputs D0..D10. After approximately 200 msec, the output „Strobe“ goes to 24 V DC and makes the PLC aware, that data is ready to be picked up. This delay is important for control systems operated with mechanical relays.
The identifier decoder’s output data remain set until the PLC sends an ”ACK” (Acknowledge-signal - which means the PLC sets the ”ACK“-line to 24 V DC). After having received the signal ”ACK”, “Strobe” is set to 0 V and the outputs D0..D10 are deleted.
When the “waiting data” has not been picked up by the PLC, data get lost when the next rake enters the sensor fork: all outputs are then set to 0 V (see above).

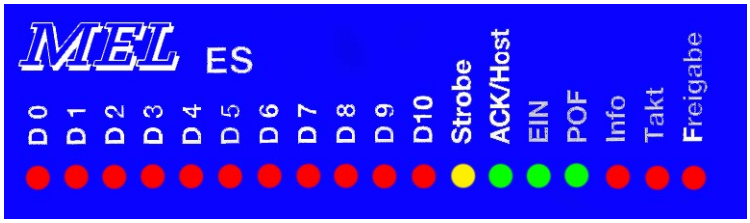



*Figure 1: LEDs at the identifier decoder*

## 2.2. Functional Description in Case of an Error

When a read error has been detected (due to a defective or misadjusted rake), the error word is sent. This is a reserved dataword, because all data (D0..D10), and shortly after “Strobe” is set to +24 V DC.
After the PLC has signaled ACK, the actual failure code appears (see section 8.1). It may be evaluated or completely ignored. Therefore no handshake is initiated for the failure code. No Strobe is set. If necessary, after receiving the „error word“ (all data outputs go to +24 V DC) the PLC can read out the failure code. The failure code remains on the data outputs until a new code rake enters the sensor fork of the decoder.

### 2.3. Functional Description „Early Warning for Contamination“

The optical sensors are equipped with an early warning system for contamination. At about 80% of contamination level the decoder first transmits data of the identified rake, followed by the error word and then a corresponding alert code (see section 8.1). Also in this case the error code can be ignored. In the case of a too high contamination a correct function is no longer ensured.

### 2.4. Functional Description of Test Mode

This test mode allows the PLC to check the connection to the identifier decoder on a contact and wire-basis. The test includes error of polarity and short-circuit testing by a simulated ”clock ringing” of the circuits. Whenever the ”ACK” signal is energized 3 times in sequence after the data was cleared by the host computer, the identifier decoder enters its ”Wire-Testing-Mode” automatically. Starting with the output D0, one output after the other is activated, one at a time. The ”ACK“ input toggles the connections. In this mode the PLC may detect one output as activated, one at a time: D0..D10 and then Strobe. After activating the last output (Strobe) or by entering a code rake into the sensor fork, the test mode is stopped and the identifier decoder is reset back to normal operation.

## 3. Identifier Decoder

The identifier decoder identifies up to 2046 different code rakes, whereas each code rake may be used only once. The number of recognizable rakes depends on the number of their tines:

| **Number of recognizable rakes** | 2046 | 1022 | 510 | 254 | 126 |
|---|---|---|---|---|---|
| **Number of tines** (including Parity) | 12 | 11 | 10 | 9 | 8 |

### 3.1. The Tracks of the Code Rakes

Figure 2 shows the schematic representation of a code rake.

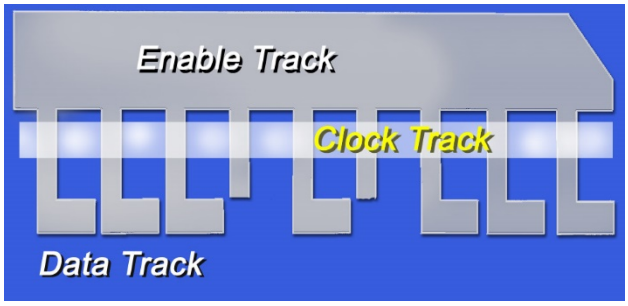



*Figure 2: Schematic representation of a code rake*

- **Enable track:** It signifies that a rake is passing the Indentifier decoder.
- **Clock track:** It is responsible for the correct data recognition.
- **Data track:** It delivers the specific data oft he code rake.

### 3.2. Encoding of the code rakes

The encoding is done binary, this means that the rake number results from the existing data flags (in the data track). The last flag (in moving direction) is the parity flag which is only set if the number of the existing data flags is uneven. Thus the number of the data flags is always kept even-numbered.
Please see the values on the following table:

| | 12 tines | 11 tines | 10 tines | 9 tines | 8 tines |
|---|---|---|---|---|---|
| **1. flag** | 1 | 1 | 1 | 1 | 1 |
| **2. flag** | 2 | 2 | 2 | 2 | 2 |
| **3. flag** | 4 | 4 | 4 | 4 | 4 |
| **4. flag** | 8 | 8 | 8 | 8 | 8 |
| **5. flag** | 16 | 16 | 16 | 16 | 16 |
| **6. flag** | 32 | 32 | 32 | 32 | 32 |
| **7. flag** | 64 | 64 | 64 | 64 | 64 |
| **8. flag** | 128 | 128 | 128 | 128 | Parity |
| **9. flag** | 256 | 256 | 256 | Parity | |
| **10. flag** | 512 | 512 | Parity | | |
| **11. flag** | 1024 | Parity | | | |
| **12. flag** | Parity | | | | |

Further data of code rakes see section 9

**Example:** A production line is equipped with code rakes with 9 tines (maximum number of rakes = 254). The data outputs D8..D10 stay not connected. Now we look at the code rake 114. The flags 2., 5., 6. and 7. are existing at this code rake (Parity is not set, because the number of the existing data flags is even):

| Flag | Flag value / Parity | Flag existing? | Value |
|---|---|---|---|
| **1. flag** | 1 | no | 0 |
| **2. flag** | 2 | yes | 2 |
| **3. flag** | 4 | no | 0 |
| **4. flag** | 8 | no | 0 |
| **5. flag** | 16 | yes | 16 |
| **6. flag** | 32 | yes | 32 |
| **7. flag** | 64 | yes | 64 |
| **8. flag** | 128 | no | 0 |
| **9. flag** | Parity | no | |
| | | **Total:** | **114** |

# 4. Installation

## 4.1. Installation of the Identifier Decoder

The OPT305x identifier decoder is attached to a rigid carrier with two M5 Allen screws.
On the bottom of the sensor fork the transport direction of the code rakes is marked by an arrow. The identifier decoder must always be mounted in transport direction “Rechts”.
The profibus version is to be provided with a sufficient potential equalization (grounding).

## 4.2. Mounting of the Code Rakes

In order to ensure a correct recognition of the identification carriers, highest accuracy and care are required when the code rakes are attached to the carriers:

- During the carriage the track accuracy must be considered both in horizontal and in vertical direction (see section 9.1).
- The code rakes must be mounted preferably vertical.
- The code rake has to pass the sensor fork axial
- Mounting direction: The code rake must be installed as shown in Figure 3. The bevelled edge points in the conveying direction. The rakes can be moved forwards and backwards through the identifier decoder.

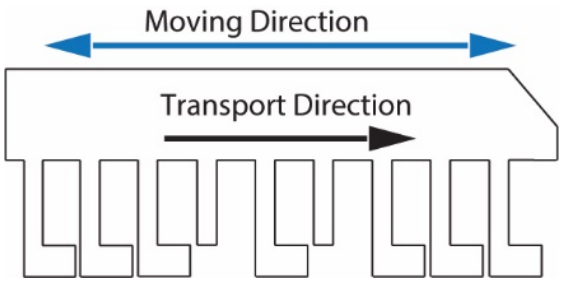



*Figure 3: Conveying and moving direction of the code rake*

# 5. Installation

## 5.1. Power Supply

The identifier decoders require 24 V DC power supply at 120 up to 350 mA (depending on type).
After impressing the voltage on the unit the LEDs „EIN“, „Info“, „Takt“ and „Freigabe“ must be illuminated. When a code rake passes the sensor fork, the two LEDs „Takt“ and „Daten“ flash. Otherwise please check the polarity of the power supply and also the power consumption of the unit with an amperemeter.
The OPT305x identifier decoders are equipped with a polarity inversal protection to prevent damage.

## 5.2. Adjusting of Code Rake Type

The identifier decoder can be adjusted to the maximum number of code rakes (that means resolution and length) by setting jumpers. It may also be left in an automatic mode which recognizes the code rake’s length automatically. This mode, however, is not recommended as the tests for the employed rake size are not performed (see section 7.7).

# 6. Identifier Decoder OPT3051 with Parallel Connection

## 6.1. Data Transmission

All outputs are short-circuit proof and deliver a current of 10 mA at 24 V
The outputs D0..D10 are consistent with the data flags of the code rakes. The strobe output signals the SPS that the data can be transfered.
Using code rakes with less tines than data outputs the higher data outputs are blank.
The inputs are protected against breakdown and overvoltage. The power consumption has a maximum of 5 mA (at state „high“). When impressing a voltage of +24 V on the input „ACK“ the OPT305x identifier decoder is informed about the data transfer to the PLC. At some models POF provides a „Power on free“ signal alternatively a spare input.

## 6.2. Pin Assignment

**Device connector**: CPC connector AMP 926147-2 with 28 pins

**Mating connector :**
- AMP 826 676-2, 28 pin CPC connector (female)
- AMP 182 655-1, cord grip
- AMP 164 169-1, pins

| Pin | Name | Function | Activated logic at max. current | Description |
|---|---|---|---|---|
| 1 | STB | Output | +24V/10mA | Ready for data transmission |
| 2 | D10 | Output | +24V/10mA | 11. data bit (MSB = max. value) |
| 3 | D9 | Output | +24V/10mA | 10. data bit |
| 4 | D8 | Output | +24V/10mA | 9. data bit |
| 5 | D7 | Output | +24V/10mA | 8. data bit |
| 6 | D6 | Output | +24V/10mA | 7. data bit |
| 7 | D5 | Output | +24V/10mA | 6. data bit |
| 8 | D4 | Output | +24V/10mA | 5. data bit |
| 9 | D3 | Output | +24V/10mA | 4. data bit |
| 10 | D2 | Output | +24V/10mA | 3. data bit |
| 11 | D1 | Output | +24V/10mA | 2. data bit |
| 12 | D0 | Output | +24V/10mA | 1. data bit (LSB = min. value) |
| 13 | ACK | Input | +24V/5mA | Acknowledgement (from SPS) |
| 14 | R1 | | | (Spare 1) |
| 15 | GND | 0 V | | Power supply |
| 16 | R2 | | | (Spare 2) |
| 17 | POF | Input | +24V/5mA | Spare, non-connected |
| 18 | R3 | | | (Spare 3) |
| 19 | R4 | | | (Spare 4) |
| 20 | VCC | +24 V | | Power supply |
| 21 | GND | 0 V | | Power supply |
| 22 | GND | Output | Open / jumper to pin 26 | see section 6.3 |
| 23 | GND | Output | Open / jumper to pin 27 | see section 6.3 |
| 24 | GND | Output | Open / jumper to pin 28 | see section 6.3 |
| 25 | VCC | +24 V | | Power supply |
| 26 | J3 | Input | Open / jumper to pin 22 | see section 6.3 |
| 27 | J2 | Input | Open / jumper to pin 23 | see section 6.3 |
| 28 | J1 | Input | Open / jumper to pin 24 | see section 6.3 |

The ground connection of the identifier decoder is isolated from the case ground, however, input an output ports are not isolated from each other and from 24 V DC.

### 6.3. Adjustment of code rake type

The adjustment is done by jumpers at the parallel connector (see section 6.2):

| | Jumper J1 | Jumper J2 | Jumper J3 | Mode (resolution) |
|---|---|---|---|---|
| Connector | Pin 28 with pin 22 | Pin 27 with pin 23 | Pin 26 with pin 24 | |
| | connected | connected | connected | automatic |
| | connected | connected | open | 7 Bit = 8 tines |
| | connected | open | connected | 8 Bit = 9 tines |
| | connected | open | open | 9 Bit = 10 tines |
| | open | connected | connected | 10 Bit = 11 tines |
| | open | connected | offen | 11 Bit = 12 tines |
| | open | open | connected | automatic |
| | open | open | open | automatic |

## 7. Identifier Decoder OPT3052/3053 with Profibus Connection

### 7.1. Data Transmission

The Profibus version transmits the input from the PLC and output of the identifier decoder according to the Profibus standard 1:1. All readers are connected to the same data line at the Profibus. Therefore a special circuit protects the identifier decoder in case of faulty cabling. This protection circuit avoids that the input voltage and 5 V DC terminator voltage could be destroyed by a short-circuit to ±24 V DC. A transmission rate of minimum 1.5 Mbaud over a length of 200 m is approved.

### 7.2. LED Display for Bus Status

Additional to the LEDs displayed in Figure 1 the Profibus version are equipped with two additional LEDs on the cover of the identifier decoder which indicate the bus status:

| Signal | Colour | Description |
|---|---|---|
| NormOper | green | Bus status OK |
| +5V | green | Illuminated when 5 V, OK |

### 7.3. Cabling

At the profibus the units are switched into series. Accordingly when inserting new units the bus cable is interrupted here and reconnected by serial connection of the inserted unit.
If equipment must be exchanged the connecting plugs and sockets of the profibus and supply voltage must be plugged together (OPT3053).

**Note:** The unit must be grounded. The customer should take care of electrical potential compensation according to the „instructions of mounting without disturbances at the programmable computer host“ (SIEMENS Order-No. 6ES5 998-7AB11). Data input /output as well as power supply have the same potential to 0 V DC and case ground.

## 7.4. Termination of Profibus

A termination resistor must be connected to each physical end for the correct operation of the Profibus. Please note that the bus is only terminated at the physical ends (see Figure 4 and Figure 5). Multiple termination leads to transmission errors or undefined behavior of the bus, constant read errors or sporadic dropouts.
As a terminating resistor, e.g. the Triconnect PBAW 04 or Lumberg 0979 PTX 101 can be used. The Profibus terminating resistor is placed on the Profibus output socket.

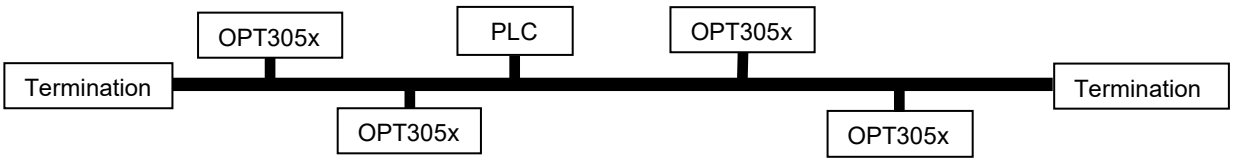



*Figure 4: Correct termination*

## 7.5. Adjustment of Profibus Address

At the Profibus each device has an individual address. For adjustment of the Profibus address, open the cover of the decoder. At the inside of the cover there are two rotary switches (the tens' and the ones' place are labeled on the circuit board) by which the address of the respective decoder can be programmed. For better control the adjusted address should be written at its due place on the outside of the cover.

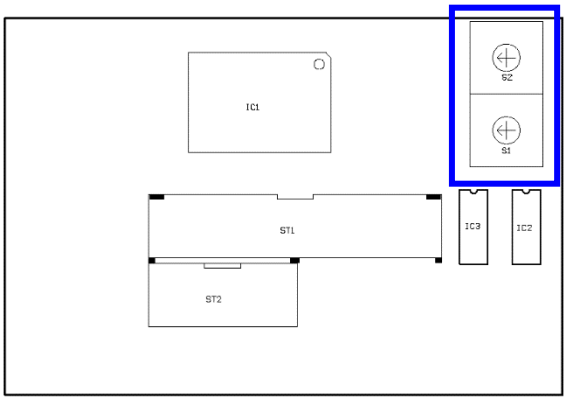



Figure 5: Position of switches for address settings

Tens: BCD switch **S1**

Ones: BCD switch **S2**

## 7.6. Displaying Data from/to the Identifier Decoder

There are used two bytes as output and two bytes as input (I/O interface ET200 simulation).
„0“ = logic zero; „1“ = logic one, assignment of J1, J2 and J3 inputs, see section 7.7.

| **Identifier decoder Output** | D0 | D1 | D2 | D3 | D4 | D5 | D6 | D7 | D8 | D9 | D10 | Strobe | 0 | 0 | 0 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Profibus Input** | PC 0 | PC 1 | PC 2 | PC 3 | PC 4 | PC 5 | PC 6 | PC 7 | PD 0 | PD 1 | PD 2 | PD 3 | PD 4 | PD 5 | PD 6 | PD 7 |

| **Identifier decoder Input** | J1 | J2 | J3 | Ack | Pof | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Profibus Output** | PA 0 | PA 1 | PA 2 | PA 3 | PA 4 | PA 5 | PA 6 | PA 7 | PB 0 | PB 1 | PB 2 | PB 3 | PB 4 | PB 5 | PB 6 | PB 7 |

| | |
|---|---|
| D0..D10 | data bits, D0 = lowest value bit |
| Strobe | valid data of Indentifier decoder are displayed |
| PD4..PD6 | always „0“ |
| PD7 | identification bit (= 1) when identifier decoder is connected |
| J1..J3 | jumper (adjustment of code rake type, see below)) |
| Ack | acknowledgement of read data |
| Pof | „Power on free“ – not used |

## 7.7. Adjustment of the Code Rake

**The adjustment is made by activation of PA0, PA1 and PA2 by the PLC.**

| **Profibus** | **PA0** | **PA1** | **PA2** | **Mode (resolution)** |
|---|---|---|---|---|
| *„connected“ = „0“ and „open“ = „1“* | connected | connected | connected | automatic |
| | connected | connected | open | 7 Bit = 8 tines |
| | connected | open | connected | 8 Bit = 9 tines |
| | connected | open | open | 9 Bit = 10 tines |
| | open | connected | connected | 10 Bit = 11 tines |
| | open | connected | open | 11 Bit = 12 tines |
| | open | open | connected | automatic |
| | open | open | open | automatic |

## 7.8. Profibus Version OPT3052

With this Profibus version, the data is processed according tot he Profibus-DP protocol (layer 2) via a 9 pin circular connector (see section 7.8.1).

### 7.8.1. Pin Assignment

The identifier decoder OPT3052 is connected via a 9 pin circular connector. The shield of the incoming and outgoing cables must be connected to the plug/socket housing (and to PE) over a large area.

**Note:** The identifier decoder has to be grounded according to the general installation guidelines

**Device connector:** 9 pole circular connector: Coninvers RC-63P 1N12 2S00

**Mating connector:** 9 pole circular connector: Coninvers RC-63P1N12 1600 with screw ring

| Pin | Name | Function | Description |
|---|---|---|---|
| 1 | A-line | Input/output | Data from the last identifier decoder (short-circuit proof to ± 24V) |
| 2 | B-line | Input/output | Data from the last identifier decoder (short-circuit proof to ± 24V) |
| 3 | +5V | Profibus | 5 V DC terminator resistance (short-circuit proof to ± 24V) |
| 4 | +24 V | Power supply | max. current consumption 180 mA |
| 5 | GND | Profibus | 0 V for terminator resistance |
| 6 | PE | Grounding | on the cable shield and housing |
| 7 | n.c. | | not connected |
| 8 | 0 V | Supply power | Power supply |
| 9 | n.c. | | not connected |

## 7.9. Profibus Version OPT3053

With this version the Profibus is completely embedded. Data transmission is made by 5 pole M12 connectors (see section 7.9.1).

### 7.9.1. Pin Assignment

The shield of incoming and outgoing cables should be connected to the male and female housings (and to PE).

**Device connector Profibus input CN1:** RSHL 5B/S 5,5 (Lumberg)

**Mating connectors**: 0976 PFC 101 (Lumberg)
PBKD 05 Ga (Triconnect)

| Pole | Name | Function | Description |
|---|---|---|---|
| 1 | +5V | Termpower out | Optional output for terminating power |
| 2 | A-line | Input/output | Data from the last identifier decoder (short-circuit proof to ±24 V) |
| 3 | DGND | Ground | |
| 4 | B-line | Input/output | Data from the last identifier decoder (short-circuit proof to ± 24V) |
| 5 | Shield | Shield | |

**Device connector Profibus output CN2:** RKHL 5B/S 5,5 (Lumberg)

**Mating connectors:** 0976 PMC 101 (Lumberg)
PBKS 05 Ga (Triconnect)

| Pole | Name | Function | Description |
|---|---|---|---|
| 1 | +5V | Termpower out | Optional output for terminating power |
| 2 | A-line | Input/output | Data from the last identifier decoder (short-circuit proof to ± 24V) |
| 3 | DGND | Ground | |
| 4 | B-line | Input/output | Data from the last identifier decoder (short-circuit proof to ± 24V) |
| 5 | Shield | Shield | |

**Device connector supply input CN3:** RSHL 4/S 5,5 (Lumberg)

**Mating connectors:** RKCW 4/9 (Lumberg)
KD 04 G PG7 (Triconnect, PG7)
KD 04 G PG9 (Triconnect, PG9)

| Pol | Name | Function | |
|---|---|---|---|
| 1 | +24V | Supply input | |
| 2 | GND | Ground, 0V | |
| 3 | | | |
| 4 | PE | Protective earth | |

**Device connector supply output CN4:** RKHL 4/S 5,5 (Lumberg)

**Mating connectors:** RSCW 4/9 (Lumberg)
KS 04 G PG7 (Triconnect, PG7)
KS 04 G PG9 (Triconnect, PG9)

| Pol | Name | Function | |
|---|---|---|---|
| 1 | +24V | Supply output | |
| 2 | GND | Ground, 0V | |
| 3 | | | |
| 4 | PE | Protective earth | |

Not used sockets for current supply can be protected by a cover (Triconnect AK GD M12 K).

### 7.9.2. Profibus Termination

The Profibus connection requires a terminating resistor at each physical end of the bus. This resistance may only be placed at the end and not in the middle of the bus, double termination as also not permitted. As a terminating resistor e.g. the Triconnect PBAW 04 or Lumberg 0979 PTX 101 can be used (see Figure 6). The Profibus terminating resistor is plugged onto the Profibus output socket.

*Figure 6: Profibus terminating resistor*

# 8. Error Handling

The identifier decoder has an extensive error control and function monitoring. For example, the failure of one of the four sensor tracks is immediately reported to the PLC. Damage to a code rake (tines or flags broken off by mechanical action) is also detected. The bus versions have autonomous bus monitoring and display errors in the event of communication problems.

## 8.1. Table of Errors

If an error has been detected, all outputs are set to “high” (corresponds to error word). As soon as the PLC has confirmed the receipt of this error word with an ACK (whether directly or via one of the busses), the broken down error code appears up to the next code rake (“on” = +24V or logical 1).

| **Error code at the output** | | | | | | | **Error type** | **Error cause** |
|---|---|---|---|---|---|---|---|---|
| **D0** | **D1** | **D2** | **D3** | **D4** | **D5** | **D6** | | |
| | **on** | | | | | | Result = 0 | Code rake or data sensor defect |
| | | **on** | | | | | More tines than set, in automatic mode more than 11 | Code rake or data sensor defect |
| | | **on** | | | | **on** | Early warning for dirt | Dirt level higher than 80% |
| | | | **on** | | | | Less tines than set, in automatic mode less than 8 | Code rake or data sensor defect |
| | | | | **on** | | | Parity fault | Code rake defect |
| | | | | | **on** | | Faulty number of tines (only when fixed number of bits) | Code rake defect |
| | | | | | | **on** | Clock sensor active before enabling track sensor active | Code rake or clock sensor defect |
| **on** | | | | | | **on** | Data sensor active before enabling track sensor active | Code rake or data sensor defect |
| | **on** | | | | | **on** | Clock sensor passive, more clocks than clock sensor active | Code rake or clock sensor defect |
| | **on** | | | **on** | | **on** | Number of flads does not comply | Clock sensor defect |

# 9. Technical Data

## 9.1. General Specifications

| **Identifier decoder** | |
|---|---|
| Fork width/nominal distance | 58 mm |
| Vertical tracking accuracy | ± 7,5 mm |
| Horizontal tracking accuracy | ± 25 mm |
| Cable length | max. 200 m |
| Transmission rate | 9,6 kBaud ... 6 MBaud |
| Conveying speed | -20..0..+20 m/min |
| Operating temperature | 0 °C ... 65 °C |
| Humidity | up to 90%, non-condensing |
| Protection class | OPT3051: IP40<br>OPT3052: IP64<br>OPT3053: IP67 |
| Power supply | +24 V DC / 100 ... 350 mA |
| Connections | Parallel or Profibus |

| **Code Rake:** | |
|---|---|
| Operating temperature | -50 °C ... 300 °C |
| Material | Steel or aluminium |
| Material thickness | 3 mm |
| Width | 105 mm |
| **Length:** | |
| 11 bit: 2046 code rakes | 314 mm |
| 10 bit: 1022 code rakes | 289 mm |
| 9 bit: 510 code rakes | 264 mm |
| 8 bit: 254 code rakes | 239 mm |
| 7 bit: 126 code rakes | 214 mm |

**Note**: The code rakes are **not** available at wenglorMEL!

## 9.2. Parallel Connection

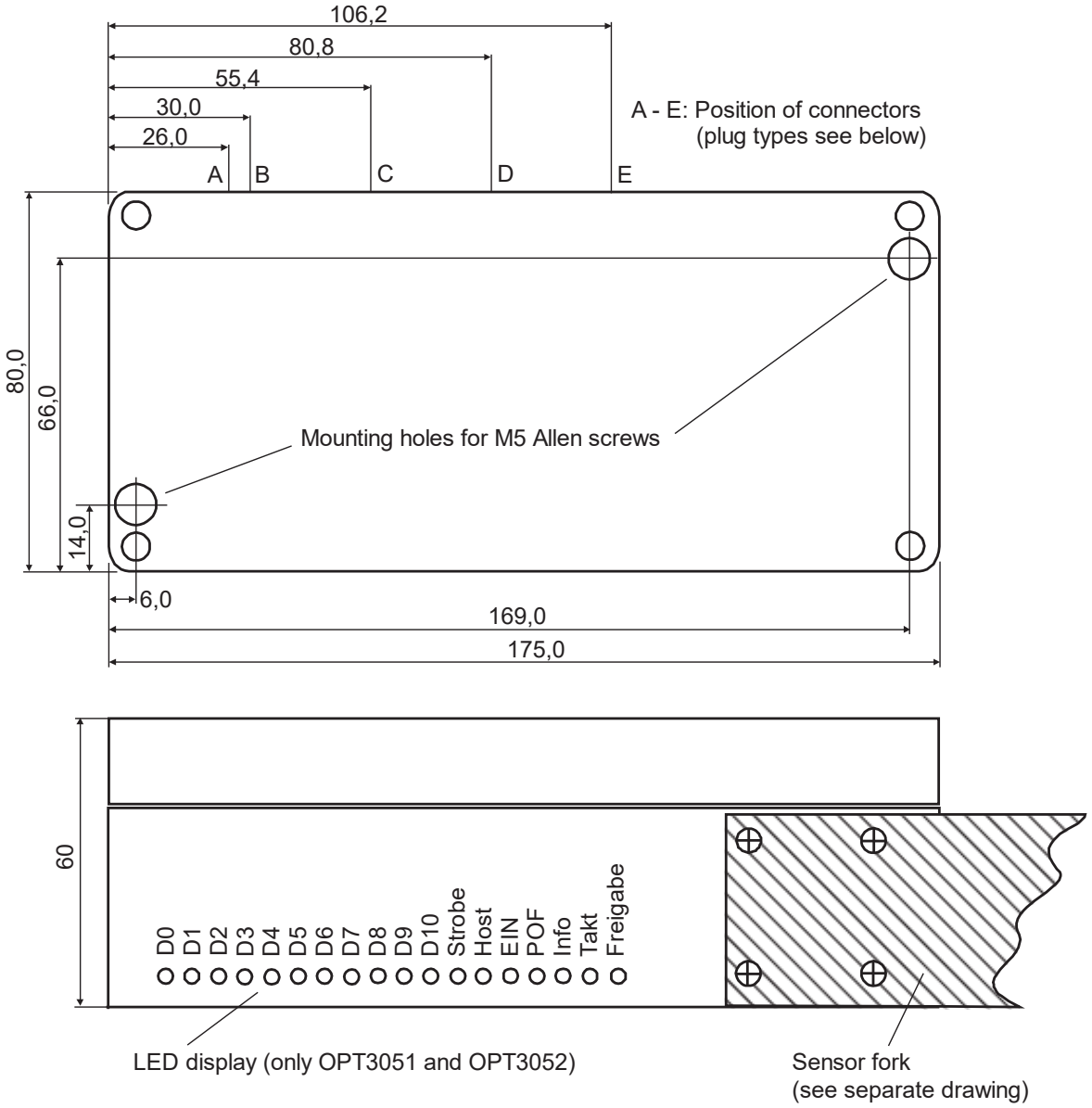
| | |
|---|---|
| Number of outputs | 12 (11 Data + 1 Handshake) |
| Output power | +24 V/10 mA (short circuit proof) |
| Number of inputs | 2 (1 handshake to SPS, 1 spare) |
| Input power | +24 V/5 mA (Input/output signals can be linked directly to the PLC) |
| Interference immunity | Supply and inputs (without J1,2,3) 500 V DC/1 µsec |

## 9.3. Profibus Connection

| | |
|---|---|
| Number of inputs/outputs | 2 ( A-line and B-line) |
| Wiring type | RS485 (Profibus-DP DIN 19 245 part1) |
| Protocol | Profibus-DP Slave level 2 Addresses 1-99 adjustable |
| Transmission rates | 9,6 kBaud bis 1,5 MBaud |
| Interference immunity | Supply and inputs 500 V DC/1 µsec ±24 V DC, permanently |

# 10. Technical Drawings

## 10.1. Electronic Unit




**Device connectors:**

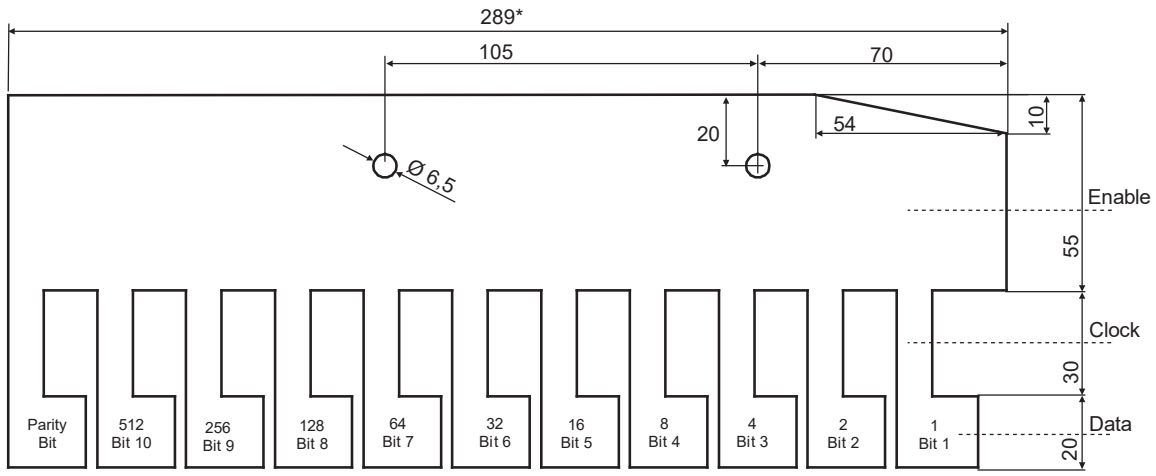
A: Parallel version OPT3051: 28 pin circular connector AMP 205840-3, Pins)

A: Profibus version OPT3052: 9 pin circular connector Coninvers RC-63 P1N1 22 S00, Pins

B - E: Profibus version OPT3053 (all Lumberg):

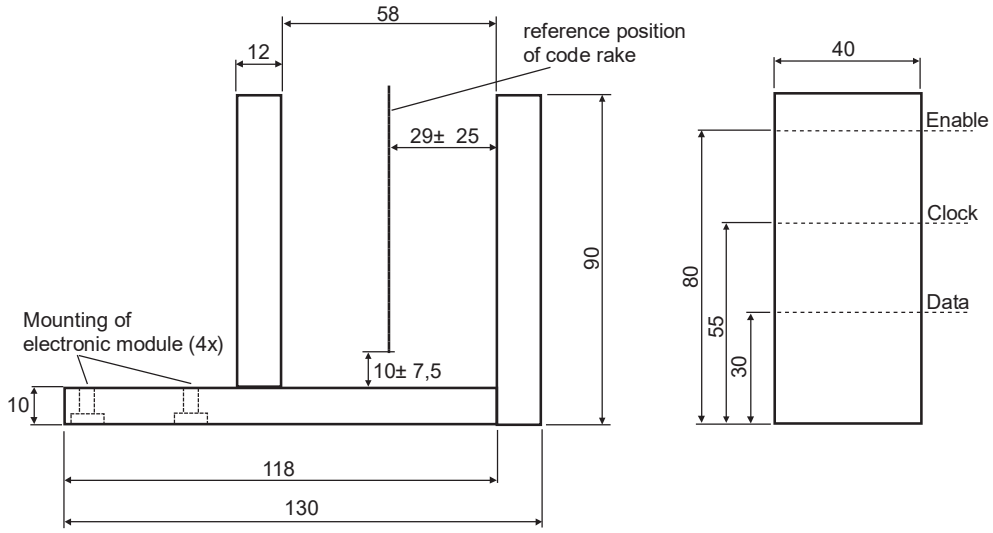
| | | |
|---|---|---|
| B: | Profibus in: | RSHL 5B/S 5,5 (5 pin, M12, male) |
| C: | Profibus out: | RKHL 5B/S 5,5 (5 pin, M12, female) |
| D: | Power in: | RSHL 4/S 5,5 (4 pin, M12, male) |
| E: | Power out: | RKHL 4/S 5,5 (4 pin, M12, female) |

## 10.2. Code Rake and Sensor Fork




* depending on number of tines (Bit version)

OPT305x- Code Rake




OPT305x- Sensor Fork

# 11. Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art, as well as applicable standars and guidelines. Subject to change without notice.
- wenglor sensoric GmbH (hereinafter referred to as “wenglor”) excludes all liability in the event of:
  - Non-compliance with the instructions
  - Use of the product for purposes other than those intended
  - Use by untrained personnel
  - Use of unapproved spare parts
  - Unapproved modification of products
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wengor assumes no liability for printing errors or other inaccuracies contained in these operating instructions, unless wenlgor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.