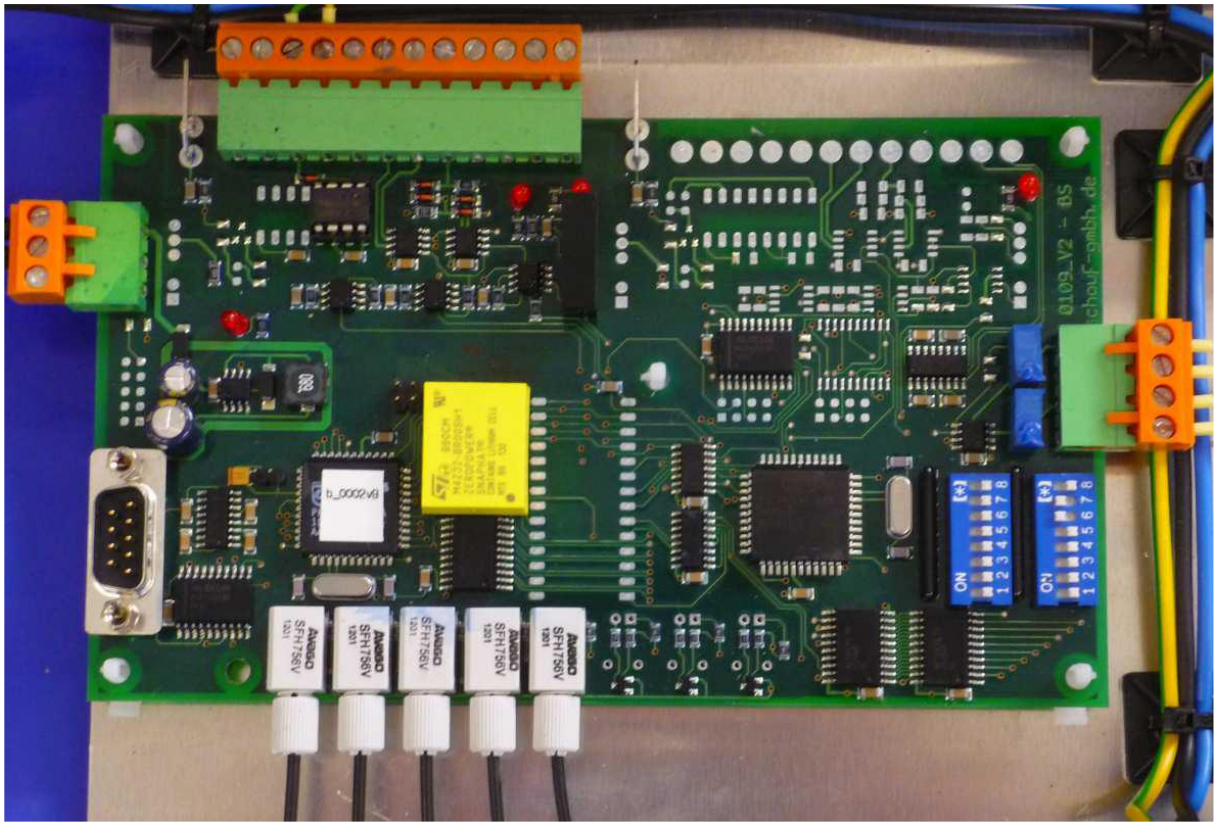
Schauf Price-Display
LED-Price Displays

Documentation



Subject to change without notice

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LED-Price Displays

Contents

1 Document revision history

Doc Ver.	Date	Changes	FW	HW
1.0	02.02.2022	Initialversion, Übernahme und Anpassung der ursprünglichen Schauf GmbH Doku	2v14	0109V2
1.01	15.06.2023	Old protocols removed	2v14	0109V2

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2 Introduction

This document contains technical information for the Schauf price pole electronics as well as examples for wiring, installation, configuration and testing.
Therefore, there may be deviations from the actual implementation and scope of delivery.
This documentation is primarily intended to serve as a support letter or information for project planning, commissioning or troubleshooting of a Schauf Price Pole.
This documentation is not a substitute for technically qualified personnel and is not a guide or instruction to the installation team.

The relevant documentation for the actual wiring, interconnection, components installed and system integration into the existing station installation should be obtained from the respective companies that assembled and installed the price pole. As well as the companies responsible for maintenance and repair at the respective station.

This documentation will not cover every possible aspect that may have occurred or may occur over the years due to changes in technology, technical progress, repairs, replacement of components, loss of documentation, changes in management and project leadership, and changes in responsibilities.

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3 Safety information

3.1 General guidelines

This manual contains information required for the deployment and use of the product in the manner intended. It is intended for technically qualified personnel who have relevant knowledge in the field of electrotechnical technology / automation technology / data transmission technology.
Qualified personnel are persons

- who, as project planners, are familiar with safety concepts in electrical technology / automation technology / data transmission technology
- or who, as operating personnel, have been trained in the handling of the devices or the system and know the contents of this manual required for this purpose
- or who have been trained as commissioning / service technicians on corresponding systems according to the standard of safety engineering.

The detailed knowledge and the technically correct implementation of the installation guidelines / safety instructions / functions described in this manual are a prerequisite for the safety of operation.

Since the components or devices described can be used in a wide variety of areas and systems, it is imperative to include their functions and the corresponding safety instructions in the safety concept of the overall system.

For questions in specific individual cases, the support of the company MSI-Sign Group is available.

3.2 Intended purpose

The components / the device may only be used in the manner for which it is designed (according to the product information or the technical description). The relevant safety standards were observed during the development, production, testing and documentation of the article. Therefore, if the handling instructions and the safety instructions are observed, the product does not normally present any hazards with regard to damage to property or personal injury.

CAUTION ⚡

- After opening the housing, parts of the equipment are accessible which may be under dangerous voltage.
- The safety of the product requires proper transport, storage, installation and operation.
- Interventions on the product may only be carried out by qualified personnel familiar with the manual (see below).

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4 Installation

4.1 Mounting

The installation of the display- frames has to be done by a certified technician.
Use the lateral holes in the aluminum frame to mount the display- frames.

4.2 Power Supply

The DC power supply for the display- frames is provided by a power supply unit.
Each price- display (front and rear) has to be connected to the PSU with a separate cable.

The power supply for the PCBs in each display- frame is already prepared (see the appendix).

The maximum power consumption (full brightness and all segments on) per display- frame is about 1,8 A.

➔ See block diagram

Notice:

Make sure that the polarization of the power supply is correct before switching on the PSU.
Otherwise the PCBs can be damaged.

4.3 Connection to the modules

The connection from the CPU- card and the front display- frame is done by a standard fibre optic cable.

e.g. **Type:** OKE 1000–B

Any single core polymer fibre optic cable with a core diameter of 1mm and an outer diameter of 2,2mm can be used.
The fibre optic cable has to be plugged directly to the transmitter (white) on the CPU- card and the receiver (black) on the display- frames.
To fasten and release the fibre optic cable, turn the plastic ring.

The PCBs on the display- frames are connected with a 10 way ribbon cable and a d.c. power supply.
Only the connection from the receiver- PCB to the first rear digit has to be done during the installation.
Keep this cable as short as possible.

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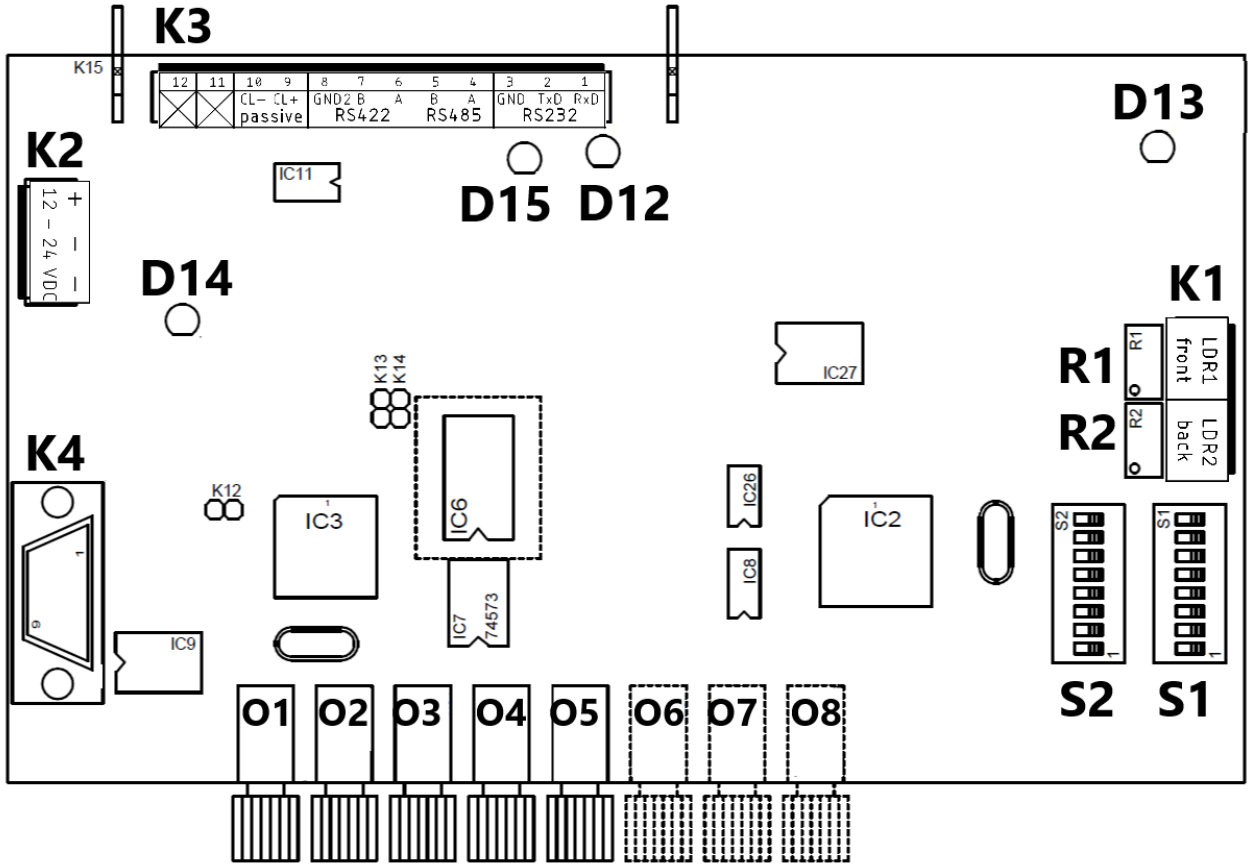
5 Startup

5.1 General

After the installation and check for short-circuits, the Price Display can be switched on.
If there are DIP- switch settings changed, the CPU- board has to be restarted (switched off for a few seconds).
The settings are shown below.

5.2 Control electronics module

5.2.1 Component overview



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5.3 Description of components

5.3.1 Diagnostic LED

D12 - Status-LED
flashes while receiving data

D13 - Status-LED
Blinking every second on nominal oparation

D14 - Power-LED
Indicates the internal 5V DC

D15 - Power-LED
indicates the internal 5V DC for the interfaces (electrically isolated)

5.3.2 Dipswitch

S1 - Dipswitch 1 (see below)

S2 - Dipswitch 2 (see below)

5.3.3 Connectors

K1 - Connector for photo sensors (LDR)
1,2 – Connector LDR front
3,4 – Connector LDR rear

K2 - Power Supply 12 – 24 VDC
1 – 12 VDC up to 24 VDC
2 – GND
3 – GND

K3 - Serial Interfaces
1 – RS232 RxD
2 – RS232 TxD
3 – RS232 GND
4 – RS485 A
5 – RS485 B
8 – RS485 GND_{iso}
9 – Current Loop CL+
10 – Current Loop CL-

K4 - Programming interface (Null modem)
Can be used for software updates and diagnostics
2 – RXD
3 – TXD
5 – GND

K15 - Protective Earth
Can be used in combination with a RS485 interface.

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5.3.4 Trim potentiometer

(Please don‘t change!)

R1 - trim-pot to adjust the basic brightness front

R2 - trim-pot to adjust the basic brightness rear

5.3.5 Fible optical interface

O1 - Type1

O2 - Type 2

O3 - Type 3

O4 - Type 4

O5 - Type 5

O6 - Type 6 (optional)

O7 - Type 7 (optional)

O8 - Type 8 (optional)

The allocation of the sequence of the lines must be done at the CPU card by allocation at the optical fiber connections O1-O5 (optional O1 - O8).

The product allocation can be adapted in the PST1 control unit via the software.

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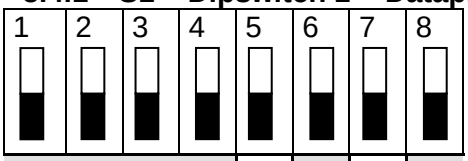
5.4 Dipswitch

5.4.1 S1 – Dipswitch 1 - Dataprotocols and display options



ON

OFF

LED segment- &. Brightness test

Leading zero suppression

Decimal point switch

z.Zt. nicht benutzt

Protocol selector :

0000 – Kienzle, Current Loop (**DEBUG**)

1000 – Scheidt & Bachmann, RS485 (**DEBUG**)

1110 – Schauf Std., Current Loop

0001 – Schauf Spezial, RS232, 1200 Bd

1001 – Schauf Spezial, RS485, 1200 Bd

0101 – Schauf Spezial, RS232, 9600 Bd

1101 – Schauf Spezial, RS485, 9600 Bd

0011 – Schauf Std., RS232

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Protocol selection (DIP 1- 4) spreadsheet

Dipswitch-S1						
1	**2**	**3**	**4**	**Protokoll**	**Schnittstelle**	**Anschluss**
Standard protocols for PST1 control unit						
1	1	1	0	Schauf-Std. Version 2vC or higher	Current Loop passiv	K3 – 9 CL+ K3 – 10 CL-
0	0	0	1	Schauf-Spezial ab Version 2vE	RS232, 1200 Bd.	K3 – 1 RxD K3 – 2 TxD K3 – 3 GND
1	0	0	1	Schauf-Spezial Version 2vE or higher	RS485, 1200 Bd.	K3 – 4 A K3 – 5 B K3 – 8 GNDiso
0	1	0	1	Schauf-Spezial Version 2vE or higher	RS232, 9600 Bd.	K3 – 1 RxD K3 – 2 TxD K3 – 3 GND
1	1	0	1	Schauf-Spezial Version 2vE or higher	RS485, 9600 Bd.	K3 – 4 A K3 – 5 B K3 – 8 GNDiso
0	0	1	1	Schauf-Std. Version 2vE or higher	RS232 (2 TxD offen)	K3 – 1 RxD K3 – 3 GND
Special protocols for testing purposes and debugging						
0	0	0	0	Kienzle	Current Loop passiv	K3 – 9 CL+ K3 – 10 CL-
1	0	0	0	Scheidt& Bachmann	RS485	K3 – 4 A K3 – 5 B

The interface (current loop passive, RS485 or RS232) is activated or deactivated by software.
The pin assignment needs to be changed to the selected protocol as required.

Notice
Changing these settings requires a restart of the CPU- board.

Special protocols for test purposes only. No guarantee of safe operation and functionality.

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- **DIP 5 – not used**

- **DIP 6 – Decimal point**
  Controls the function of the decimal point (if available)

  ON – decimal point on
  OFF – decimal point off

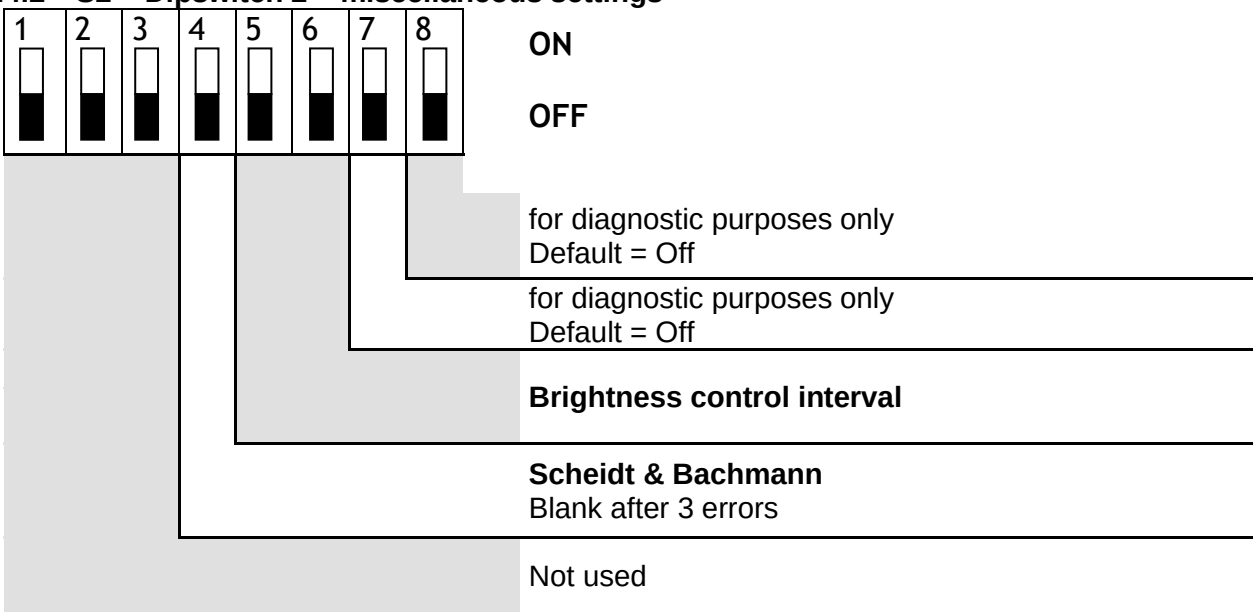
  This setting can be changed during operation.

- **DIP 7 – leading zero suppression**
  Is used to control leading zeros on the first and the second digit.

  ON - **show** leading zeros
  OFF - **don't show** leading zeros

  This setting can be changed during operation.

5.4.2 S2 – Dipswitch 2 – miscellaneous settings



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- **DIP 1-3 – not used**

- **DIP 4 – only Scheidt & Bachmann**

  ON – clear display after 3 errors
  OFF - no clearing

  Changing this setting requires a restart of the CPU- board.

  DIP 5-6 – Brightness control interval
  To control the update interval of the brightness control.

  During this time the mean value of last interval is used for the brightness control.
  A larger interval can be necessary to reduce brightness interferences (i.g. by traffic lights).

-

  00 - Update interval ca. 1 Sec
  01 - Update interval ca. 5 Sec
  10 - Update interval ca. 10 Sec
  11 - Update interval ca. 15 Sec

  This setting can be changed during operation.

  Notice
  The trim-pots are used to adjust a basic brightness- value in a small range.
  These trim-pots are already adjusted and should not be changed.

  A basic- brightness of 5% is predetermined

- **DIP 7-8 – Diagnostic display**

  When used, the price display is switched to a diagnostic mode.

  DIP 7-8 on 01 = Brightness value of front side is displayed.
  (between 0000 and 0099)
  DIP 7-8 on 10 = Brightness value of back side is displayed
  (between 0000 and 0099)
  DIP 7-8 auf 11 = Show firmware version (e.g. “2 14”)
  DIP 7-8 auf 00 = Nominal operation mode.

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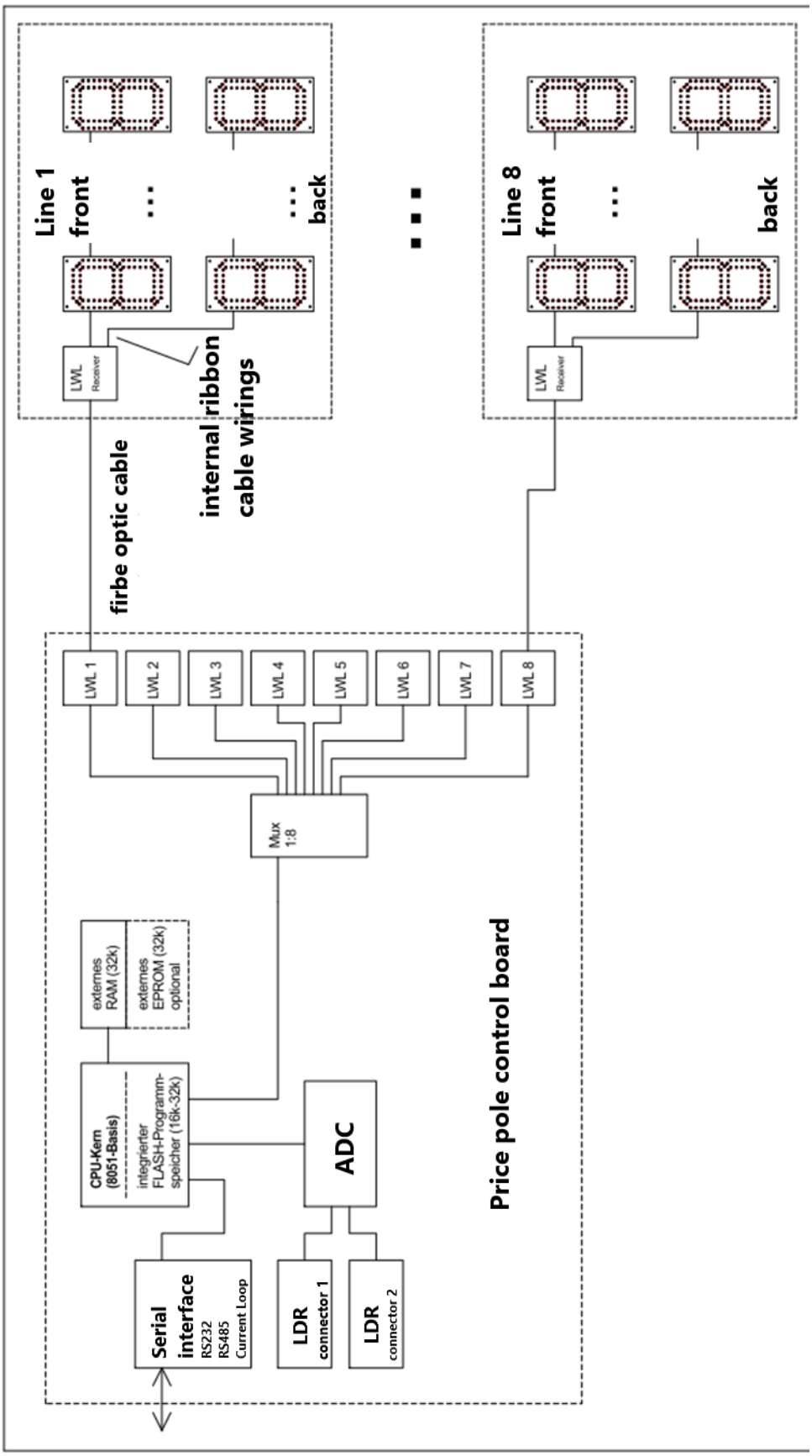
6 block diagram



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7 Function test

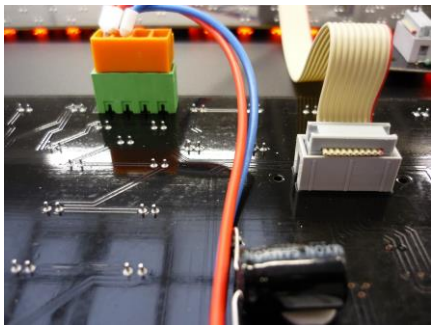
After completion of the assembly and wiring work and
Before switching on the power supply:

1. check all cables/wires to ensure that they are correctly routed in the housing. They should not be in contact with sharp-edged parts of the housing, nor should they be squeezed.
2. There should be no metal debris anywhere in the housing or on the electronic components.
3. Make sure that the two brightness sensors (front and rear) are mounted correctly. They should not be covered or slipped into the housing. It needs to be ensured that the sensors can measure the ambient brightness, otherwise the brightness control of the LED will not work properly.
4. The housing needs to be closed in such a way that no water can ingress.
5. The housing needs to be well ventilated to prevent heat accumulation and water condensation. The ventilation openings therefore have to be free of dust and dirt.

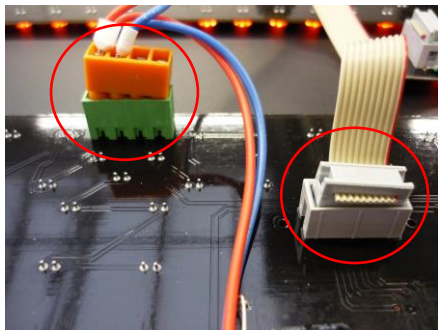
7.1 Ckecking the connectors

The display lines are supplied as individual lines pre-wired for installation in the existing housings. Despite inspection before delivery and careful packaging, connectors may become partially or completely detached during transport and connectors may come loose partially or completely. Also, due to the assembly, some plugs have to be plugged in during the be plugged in when the lines are installed.

After installation, all connectors of the ribbon cables,
power supply lines and fiber optic cables must be checked for correct fitting.



Connector OK



Connector not OK
(Connectors are not fully plugged in)

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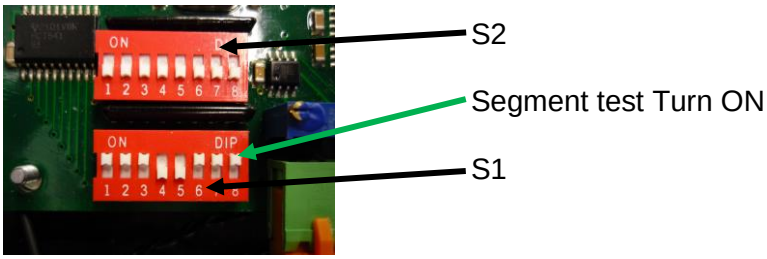
7.2 Display segment test

After switching on the power supply, a segment test should first be performed to check the correct function of each display line.

Turn on segment & brightness test (Dip 8 / S2)

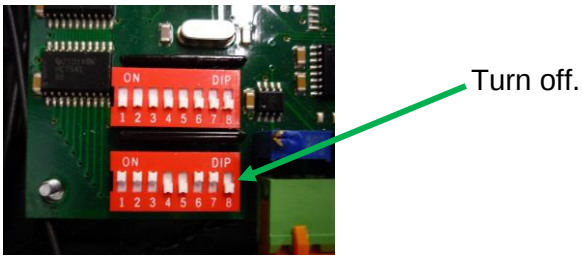


The segments on all digits are now controlled individually one after the other. This is followed by a brightness test. The display starts with the lowest brightness and changes continuously to the highest brightness. The test then starts again.

Optical check: are all segments controlled correctly?
It is also not allowed to display more than one segment on one digit at the same time.
Was there a brightness test or was the display always dark or always very bright?

After the check has been completed, the segment test is switched off again.

Turn off segment & brightness test (Dip 8)



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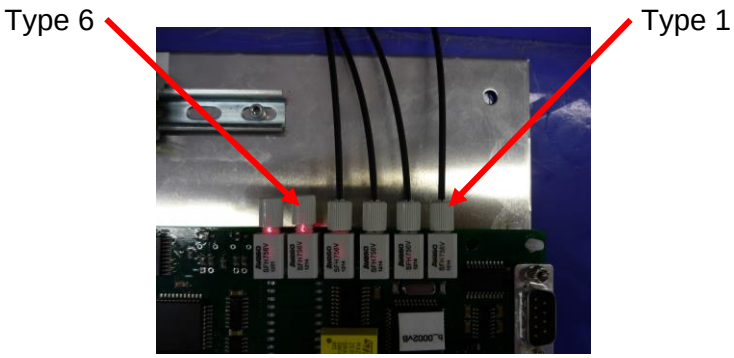
7.3 Sequence check

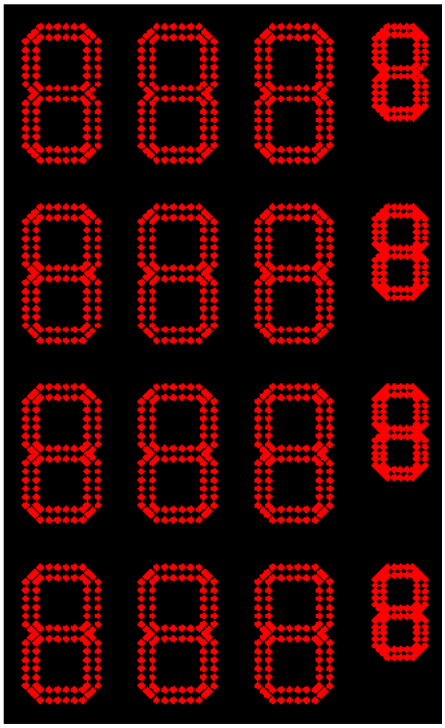
Enter the grades 1-X and send to the price display
Grade 1 "1111" Grade 2 "2222" Grade 3 "3333" Grade 4 "4444"
Check if the order of the sent numbers are displayed correctly (from top to bottom)
If not, reconnect the fiber optic cables on the control electronics until the correct sequence is displayed.



Nevertheless, what the "correct" order is cannot be defined here.
However, it is recommended to keep the physical allocation the same.
To adapt the product allocation to the circumstances by means of the setting in the PST1 operating device and to document it.
(Does not apply to AST1000 or MST500 series operator devices).

7.4 Testing the brightness controll

Send „8888“ to every line.



Use a light source (flashlight, etc.) to illuminate the light sensor.

The brightness of the displays should now increase evenly in all lines on the corresponding side.

If one of the lines does not change in brightness, it is possible that the line of the other side will change.
Then probably the ribbon cables
from the fiber optic receiver to the display lines front/rear side are interchanged

Perform this check for both sides.

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7.5 Troubleshooting

Failure	Possible reasons	Measures
Total price pole is not lit.	• 230VAC missing • 15VDC at output switching power supply not present • All lines set to "blank • Control electronics defective	• Check fuse in control cabinet • Switching power supply defective or short circuit • Send prices again, or trigger self-test • Replace control electronics
No data transmission from the control panel to the pole.	• Cable connection control panel-->price pole defective • Data line connection reversed • Wrong physical interface or PT protocol • Wrong interface set on the control electronics.	• Check cable connections • Replace wires on the control electronics • Set the control panel to the appropriate PT protocol • Set the correct interface on the S1 dipswitch
No data transmission from the POS system to the control unit	• Cable connection POS-> control unit faulty • Connections of the data line reversed • Wrong POS module inserted • POS system not configured correctly	• Check cable connection and pin assignment • Check PST1 POS module • Contact the technical support of the POS system
One product does not display on both sides	• Fiber optic Linecontroller defective • No power supply to the line • Ribbon cable receiver-->line • FO cable not plugged in correctly	• Replace fiber optic linecontroller • Check power supply cable from switching power supply to line. • Connector plugged in correctly? Replace ribbon cable • Connect fiber optic cable correctly to the control electronics and to the fiber optic receiver line. Cable needs to be plugged in as far as possible. • Re-cut fiber optic cable end (Attention: only with a sharp cutter knife and vertical cut. • Please do not use side cutters!
One or more digits of a line do not light up	• One or more digits defective • Ribbon cable or power supply	• digit which is still lit. Output defective, replace • The first digit that is no longer lit. Input defective, replace. • Check connector, replace cable
One product lights up with a different luminosity than the others, on the other hand it is exactly the other way round	• Ribbon cables from the fiber optic linecontroller to the sides reversed.	• Replace flat ribbon cables at the linecontroller
The brightness sensor of the front controls the back	• Connection of the brightness sensors to the control electronics reversed.	• Swap connections

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