Operating instructions and spare parts list

OptiControl CM21

Translation of the original operating instructions
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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the OptiControl CM21 control unit.

These safety regulations must be read and understood before the OptiControl CM21 control unit is used.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema operating instructions. The general safety precautions must also be followed as well as the regulations in the operating instructions.

**DANGER!**
Danger due to live electricity or moving parts. Possible consequences: Death or serious injury

**WARNING!**
Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

**INFORMATION!**
Useful tips and other information

Conformity of use

1. The OptiControl CM21 is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.

2. Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. Gema Switzerland GmbH must be consulted prior to any use of the OptiControl CM21 for any purposes or substances other than those indicated in our guidelines.

3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of
conformity of use. The OptiControl CM21 should only be used, 
maintained and started up by trained personnel, who are 
informed about and are familiar with the possible hazards 
involved.

4. Start-up (i.e. the execution of approved operational tasks) is 
forbidden until it has been established that the OptiControl CM21 
has been set up and wired according to the guidelines for 
machinery (2006/42/EC). EN 60204-1 (machine safety) must 
also be observed.

5. Unauthorized modifications to the OptiControl CM21 exempt the 
manufacturer from any liability from resulting damage.

6. The relevant accident prevention regulations, as well as other 
generally recognized safety regulations, occupational health and 
structural regulations are to be observed.

7. Furthermore, the country-specific safety regulations also must be 
observed.

<table>
<thead>
<tr>
<th>Explosion protection</th>
<th>Protection type</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE Ex II 3D</td>
<td>IP54</td>
</tr>
</tbody>
</table>

Product-specific safety measures

General information

The OptiControl CM21 is a constituent part of the system and is thus 
integrated into the safety system of the plant.

If it is to be used in a manner outside the scope of the safety concept, 
then corresponding measures must be taken.

Note:
For further information, see the more detailed Gema safety 
regulations!
About this manual

General information

This operating manual contains all important information which you require for the working with the OptiControl CM21 control unit. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the function mode of the individual system components - booth, gun control unit, reciprocator or powder injector - you will find in the corresponding enclosed documentations.

Software-Version

This document describes the operation of the OptiControl CM21, starting from the following software versions:

<table>
<thead>
<tr>
<th>Software</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Galileo</td>
<td>CM21_V55_35a</td>
</tr>
<tr>
<td>MXPro</td>
<td>CM21_V55_35b</td>
</tr>
</tbody>
</table>
Function description

Field of application

The OptiControl CM21 is a master control unit. It is used exclusively for operating a powder coating system with the corresponding control units. Any other use of the product will be considered as non intended use. The manufacturer is not responsible for any damage resulting from this; the risk for this is assumed by the user alone.

The OptiControl CM21 is particularly suitable for the fully automatic coating of any kind of parts. Also in the case of color changes, the OptiControl CM21 ideally supports the operator. The OptiControl CM21 is developed particularly for the operation on the Magic booths.
# Technical Data

## OptiControl CM21

### General

<table>
<thead>
<tr>
<th>OptiControl CM21</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of guns</td>
<td>24</td>
</tr>
<tr>
<td>Gun control unit</td>
<td>OptiTronic CG0x/OptiStar</td>
</tr>
<tr>
<td>Max. number of axes</td>
<td>4</td>
</tr>
<tr>
<td>Reciprocator control unit</td>
<td>CR0x</td>
</tr>
<tr>
<td>Monitor size</td>
<td>5,7”</td>
</tr>
<tr>
<td>Communication</td>
<td>by CAN bus</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0-40°C</td>
</tr>
<tr>
<td>Storing temperature</td>
<td>-20-60°C</td>
</tr>
<tr>
<td>Protection type</td>
<td>IP54</td>
</tr>
</tbody>
</table>

### Electrical data

<table>
<thead>
<tr>
<th>OptiControl CM21</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal voltage</td>
<td>24 VDC SELV, safety low voltage</td>
</tr>
<tr>
<td>Tolerance</td>
<td>+/- 10%</td>
</tr>
<tr>
<td>Reverse battery protection</td>
<td>yes</td>
</tr>
<tr>
<td>Protection</td>
<td>yes (internal fuse)</td>
</tr>
<tr>
<td>Potential separation</td>
<td>no</td>
</tr>
<tr>
<td>Power consumption</td>
<td>max. 34 W</td>
</tr>
</tbody>
</table>

### System

<table>
<thead>
<tr>
<th>OptiControl CM21</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>RISC/32 Bit, 400 MHz</td>
</tr>
<tr>
<td>Memory</td>
<td>64 MB</td>
</tr>
<tr>
<td>Remanent memory</td>
<td>32 kB</td>
</tr>
<tr>
<td>Compact Flash-Slot</td>
<td>yes / 1</td>
</tr>
</tbody>
</table>
### Display

<table>
<thead>
<tr>
<th>OptiControl CM21</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>LCD STN color</td>
</tr>
<tr>
<td>Resolution</td>
<td>320x240</td>
</tr>
<tr>
<td>Number of colors</td>
<td>256</td>
</tr>
<tr>
<td>Display surface</td>
<td>118x89 mm</td>
</tr>
<tr>
<td>Operation</td>
<td>by infrared touch</td>
</tr>
<tr>
<td>Front screen</td>
<td>SVG, anti reflex coated, scratch-proof</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>OptiControl CM21</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>406 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>275 mm</td>
</tr>
<tr>
<td>Height</td>
<td>178 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>9.3 kg</td>
</tr>
</tbody>
</table>
Operating and display elements

Operation

All devices are operated exclusively by the touch panel, which program sequence is described on the following pages. Additionally, the following described switches and displays are available.

Front side

OptiControl CM21 - operating and display elements

- S1  Key switch (control voltage ON/OFF)
- S2  Emergency stop key (plant switch off in emergency case)
- S3  Illuminated push button (malfunction acknowledgement)
- H1  Illuminated element (control voltage OK)
- TP  Touch panel
Rear side

OptiControl CM21 - operating and display elements (rear side)

2.3 AUX Internal control signals connection
2.5 CAN IN
2.6 CAN OUT

Parasitic control current circle connection

There is the possibility of connecting a parasitic control current circle, additionally to the internal emergency stop control current circle. Therefore, the blind lock is replaced by a PG16 stuffing box and the control cable is connected to the existing tension spring terminals. The terminal allocation specification is described in the wiring diagram.
Start-up

General information

The OptiControl CM21 is parameterized, configured and tested at the Gema premises. This allows a faster start-up, because less parameters must be locally adjusted.

The application data in the laboratory report offer an additional assistance, because these can be used as basic adjustment for guns and reciprocators.

General operating instructions

Symbols

- Key is not activated
- Key is activated
- Value input
- Show help text

Violet color

- Gun not accessible by CAN bus
- Axis not accessible by CAN bus

Yellow color

- Gun accessible by CAN bus
- Axis accessible by CAN bus

Green color

- Gun sprays powder
- Axis moves
Function keys

Open / close the cone caps

1. Press the key [image]. The cone caps open.

2. Press the key [image]. The cone caps close.

Error acknowledgement, alarm horn switches off.

Menu structure
Starting the equipment

General information

1. Switch on the main switch on the plant control cabinet. Switch on the control voltage by key switch, the illuminated element on the OptiControl CM21 shines. The OptiControl CM21 starts the operating system now, the PLC control and the operating software until to starting page.

2. Press the start key.
   The monitor switches to the main page.

   The key fields at the bottom of the monitor are locked.
   By logging in on user level 3 or lower, the keys are activated for operation.
Log-in

Press the key

The following page is displayed:

Error page for logging in

3. Press the key
   All axes move to their reference point position.

4. Press the key
   Equipment switches to manual operating mode and the following page is displayed:
Parameterization of the equipment

Press the key
The following page is displayed:

Main page parameterization
Starting points of axes and guns

Press the key

The following page is displayed:

Adjust starting points, pretravel and overtravel:

1. Modify starting points for each gun
2. Modify starting points for each axis

Powder hose length correction

Press the key

The following page is displayed:

1. Determine and enter the minimum powder output (FL_min) and correction value (SKW%) in accordance to the OptiTronic CG02 operating instructions
Pretravel and overtravel of axes and guns

Press the key

The following page is displayed:

<table>
<thead>
<tr>
<th>Achse</th>
<th>Vorlauf [cm]</th>
<th>Nachlauf [cm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

Pretravel and overtravel of axes and guns

1. Adjust pretravel and overtravel for each axis
2. Adjust pretravel and overtravel of the guns

Calibration of the CAN bus sensor

Press the key

The following page is displayed:

Calibration of the CAN bus sensor

Four calibration options are available

1. Calibrating a measuring section of 2 meters by start/stop key
2. Calibrating a measuring section of 2 meters with the indication of the time needed for it by pressing the start key
3. Calibrating by indicating the current conveying speed and by pressing the start key
4. Calibrating by indicating the drive shaft diameter and by pressing the start key
5. Adjust the preceding sign of the CAN bus sensor

Segmentation of the light grid, masking the light grid

Press the key

The following page is displayed:

<table>
<thead>
<tr>
<th>Pistolengruppe</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0000000000001111</td>
<td>0000000011110000</td>
<td>0000111100000000</td>
<td>1111100000000000</td>
<td>1111111111111111</td>
<td>1111111111111111</td>
<td>1111111111111111</td>
<td>1111111111111111</td>
</tr>
</tbody>
</table>

Light grid evaluation for gun shutdown

1. Light grid distance is the distance between two light grid widths
2. Spraying distance is the shortest spraying distance needed on the equipment
Segmentation of the light grid, light grid distance, minimum spraying distance

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>Pistolengruppe</th>
<th>9</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>20 cm</td>
</tr>
</tbody>
</table>

Segmentation of the light grid, light grid distance, minimum spraying distance

Touch fields on main page

Activated touch key fields

Light grid information
Touch fields one level lower

Press the large touch field
Following page is displayed:

Main page one level lower

Edit axis values, select or deselect axes

Edit gun values and select or deselect, daily correction

Conveyor simulation, if conveyor does not run or CAN bus sensor is not installed or defective

Start and stop guns

Start and stop axes
Start and stop axes, select or deselect

Press the key . The following page is displayed:

For details, see chapter "Operating modes"

Select and deselect guns, daily correction

Press the key . The following page is displayed:

For details, see chapter "Operating modes"
Edit gun values

Press the key 00.
The following page is displayed:

Press the key.
The following page is displayed:

Check the light grid

Press the key .
The following page is displayed:

1. Display of the width on the left and on the right
2. Display of the lowest interrupted beam
3. Display of the segments
Equipment in automatic operation mode

Press the key.
The following page is displayed:

Automatic operation mode

The workpieces are coated in a fully automated operating mode.
Guns switch on if required, and the axes travel to the entered positions.

Automatic operation mode - one level lower
Operating modes

Overview

Activated key fields

Edit axis values, select or deselect axes

Edit and select or deselect gun values, daily correction

Conveyor simulation, if the conveyor does not run or CAN bus sensor is not installed or defective

Start and stop guns
Start and stop axes

Select **Automatic** operating mode

Select **Manual** operating mode

Select **Cleaning** operating mode

Select **Service** operating mode

Information **All Axes are referenced**
Manual operating mode

Press the key
The following page is displayed:

Manual operation main page

Press the large touch field in the middle
The following page is displayed:

Manual operating mode
Edit axis values, select or deselect axes

Press the key
The following page is displayed:

1. Press the key
   The key turns green and the axis is selected. Only selected axes can be started

2. Press the key
   The axes start

3. Press the key
   The axes stop

4. The input fields allow the user to modify the position of the axes
Select or deselect guns and daily correction

Press the key or
The following page is displayed:

```
1 00  
2 00  
3 00  
4 00  
* 100 %
```

Daily correction, select or deselect guns

**Select or deselect guns**

1. Press the key
   The key turns green and the gun is selected
2. The input fields allow the user to modify the gun values

**Edit gun values**

Press the key
The following page is displayed:

```
kV    99  
μA  20  
  0.3  
```

**Edit gun values**

1. Modify daily correction value for each station
2. Select or deselect guns
**High voltage test**

Press the key \( \text{HV} \)

The key turns red \( \text{HV} \)

1. The main magnetic valve will be closed
2. The axes will be switched off

**Copy gun data**

1. Press the key
   The data is copied to the clipboard

2. Press the key
   The following page is displayed:

   ![Copy gun data](image)

3. Press the key \( \text{00} \) of the gun on which the data shall be copied

4. Press the key
   The data will be copied

**Axes start independently from the conveyor**

1. Press the key
   The key turns green \( \text{HV} \) and the activated conveyor is simulated

2. Press the key
   The key turns green \( \text{HV} \) and the reciprocators move, if the axes are selected
Guns start independently from the conveyor

1. Press the key
   
   The key turns green and the activated conveyor is simulated

2. Press the key
   
   The key turns green and the guns spray powder, if the guns are selected
Automatic operation mode

Press the key ◯
The following page is displayed:

Automatic operation main page

Press the large touch field in the middle
The following page is displayed:

Automatic operation mode - one level lower

- The guns and axes start automatically based on the information from the light grid or light barrier
- Object changes are carried out manually or automatically
- Daily correction of the powder output can be modified
- Guns can be selected or deselected
- Light grid can be controlled
- See chapter "Manual operation mode"
Simulation of the CAN bus sensor

Press the key [Diagram]
The key turns green 🟢 and the activated conveyor is simulated.
This means, the CAN bus sensor can be defective, or the conveyor is not ready for operation. By this CAN-Bus sensor simulation, the coating operation still can take place.
Press the key [2.00 m/min] to enter the conveying speed.

Cleaning operation

Press the key [Diagram]
The following page is displayed:

Cleaning operation main page

1. If the system is equipped with doors, these have to be closed first
2. Press the key [Diagram]
The **external gun cleaning** is started and the key turns green 🟢
The X axes travel into the booth to their final position.
The Z axes travel to the set height of the cleaning position.
Once the X axes reached the position, the waiting period runs down.
Subsequently, the X axes travel out of the booth and the outer cleaning valves are opened.
3. Press the key [Diagram]
The **internal gun cleaning** is started and the key turns green 🟢
The X axes travel into the booth and the powder center receives the release to blow out the hoses and guns.

4. Press the key

The ring rinsing switches on and the key turns green

5. Press the large touch field in the middle

Following page is displayed:

- Cleaning operation one level lower

Press the key

The following page is displayed:

- Cleaning positions of the axes

- Enter the cleaning positions and speed
- Enter the waiting time for the external cleaning
Service operation

Press the key. The following page is displayed:

Main page service

Check the light grid

Press the key. The following page is displayed:

Light grid information
- Display of the width on the left and on the right
- Display of the lowest interrupted beam
- Display of the segments
Administration of operating hours

Press the key
The following page is displayed:

Main page operating hours

- Operating hours of the different operating modes are displayed
- Operating hours fan
- Operating hours axes
- Operating hours guns

Press the key
The following page is displayed:

Operating hours
Press the key \[ 0.1 \text{[h]} \].
The following page is displayed:

**Operating data**

1. Set the nominal value
   When the actual value reaches the nominal value, an error message is displayed.

2. Press the key
   The actual value is added to the total value and set to zero.

Lamp test

Parameterization of the equipment
Parameterization

Press the key
The following page is displayed:

Main page parameterization

- General parameters
- Station parameters
- Calibration of the CAN bus sensor
- Booth parameters
- Light grid parameters for gun switch-off
- Light grid parameters for stroke switching
General parameters

Press the key
The following page is displayed:

General information

- Minimum pulse time,
  Time until "conveyor does not run" - signal for switch-off of axes and guns

- Delay axes on,
  Time until "conveyor runs" - signal for switch-on of the axes

- Delay guns on,
  Time until "conveyor runs" - signal active for switch-on of the guns

- Rinsing pulse,
  Rinsing time of the powder guns in the gap.

- Pulse length warning light on
  Time until error light and alarm turn off

- Pulse length warning light off
  Time until error light and alarm turn on

- Delay of messages
  Time from the occurrence of an error to the display on the screen
Station parameters

Press the key
The following page is displayed:

Starting points of axes and guns

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>Achse</th>
<th>Startpunkt [cm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
</tr>
</tbody>
</table>

Adjust starting points, pretravel and overtravel:

1. Modify starting points for each gun
2. Modify starting points for each axis
Powder hose length correction

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>FL_min</th>
<th>SKW%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>100</td>
</tr>
<tr>
<td>1.8</td>
<td>100</td>
</tr>
<tr>
<td>1.8</td>
<td>100</td>
</tr>
<tr>
<td>1.8</td>
<td>100</td>
</tr>
</tbody>
</table>

1. Determine and enter the minimum powder output (FL_min) and correction value (SKW%) in accordance with the OptiTronic CG02 operating instructions

Pretravel and overtravel of axes and guns

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>Achse</th>
<th>Vorlauf [cm]</th>
<th>Nachlauf [cm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

1. Adjust pretravel and overtravel for each axis
2. Adjust pretravel and overtravel of the guns
Calibration of the CAN bus sensor

Press the key.

The following page is displayed:

Calibration of the CAN bus sensor

Four calibration options are available:

1. Calibrating a measuring section of 2 meters by start/stop key
2. Calibrating a measuring section of 2 meters with the indication of the time needed for it by pressing the start key
3. Calibrating by indicating the current conveying speed and by pressing the start key
4. Calibrating by indicating the drive shaft diameter and by pressing the start key
   - Adjust the preceding sign of the CAN bus sensor
Light grid segmentation, masking the light grid

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>Pistolengruppe</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0000000000001111</td>
<td>00000001111000</td>
<td>00001111110000</td>
<td>11111110000000</td>
</tr>
</tbody>
</table>

Maskierung: 11111111111111

Light grid evaluation for gun shutdown

- Light grid distance is the distance between two light grid widths
- Spraying distance is the shortest spraying distance needed on the equipment

Light grid segmentation, light grid distance, minimum spraying distance

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>Pistolengruppe</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11111111111111</td>
<td>11111111111111</td>
<td>11111111111111</td>
<td>11111111111111</td>
</tr>
</tbody>
</table>

Lichtabstand: 20 cm
Sprühabstand: 20 cm

Light grid distance and spraying distance
Various parameters

Press the key
The following page is displayed:

<table>
<thead>
<tr>
<th>Kontrolldistanz</th>
<th>Ausblendfenster</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 cm</td>
<td>0 cm</td>
</tr>
<tr>
<td>Spüldistanz</td>
<td>Lücke</td>
</tr>
<tr>
<td>20 cm</td>
<td>200 cm</td>
</tr>
<tr>
<td>Aussen-Beschichtung</td>
<td>Volllauf</td>
</tr>
<tr>
<td>10 cm</td>
<td>10 cm</td>
</tr>
<tr>
<td>Inner-Beschichtung</td>
<td>-10 cm</td>
</tr>
<tr>
<td>Objekt</td>
<td>30 cm</td>
</tr>
<tr>
<td></td>
<td>30 cm</td>
</tr>
</tbody>
</table>

Various parameters

- Check distance:
  Allows to control the pollution or functionality of the light grid or light barrier

- Rinsing distance:
  If there is no object during the set distance, the powder hoses are rinsed, if rinsing function is activated

- Window hiding feature:
  Hooks or hangers can be hidden

- Gap:
  If there is no object detected during this distance, the X axes travel out of the booth and the outer cleaning valves blow off the guns

- Pretravel and overtravel:
  - Guns external coating
  - Guns internal coating
  - Object
Object data administration

Load and save object data

Press the key
The following page is displayed:

Load object data

- Line up
- Line down
- Save object data
- Copy data to clipboard
- Copy data from clipboard
Copy and insert object data

1. Select object data with the arrow keys
   ![Load object data](image)

2. Press the key
   Object data is loaded

3. Press the key
   Object data is copied to the clipboard

4. With help of the arrow keys, select the object to which the data shall be copied from the clipboard

5. Press the key
   Object data is loaded

6. Press the key
   Object data is copied to the current object

7. Press the key
   Object data is saved
Name object data

The screen keyboard is opened by pressing the table field. With the help of this, the record can be inscribed.

Indicate object data
## Error display

### Main page error display

Press the key

The following page is displayed:

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Description</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>016</td>
<td>Kabine nicht bereit</td>
<td>03.05.05 11:09</td>
</tr>
</tbody>
</table>

Press the key

The following page is displayed:

- **Line up**
- **Line down**
- **Display error history**
- **Delete inactive error messages from the list and acknowledge errors**
- **Display of the active CAN bus devices**
Active CAN bus devices

Press the key.
The following page is displayed:

**CANbus-Adresse**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
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<td>48</td>
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<tr>
<td>49</td>
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<td>56</td>
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<tr>
<td>57</td>
<td>58</td>
<td>59</td>
<td>60</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
</tr>
</tbody>
</table>

Active CAN bus devices - first page

Press the key.
The following page is displayed:

**CANbus-Adresse**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
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<td>22</td>
<td>23</td>
<td>24</td>
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<tr>
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<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>32</td>
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<td>37</td>
<td>38</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td>41</td>
<td>42</td>
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<td>44</td>
<td>45</td>
<td>46</td>
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<td>48</td>
</tr>
<tr>
<td>49</td>
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<td>55</td>
<td>56</td>
</tr>
<tr>
<td>57</td>
<td>58</td>
<td>59</td>
<td>60</td>
<td>61</td>
<td>62</td>
<td>63</td>
<td>64</td>
</tr>
</tbody>
</table>

Active CAN bus devices - second page

Fields colored in green show active CAN bus devices.
### Check digital inputs and set and delete outputs

Press the key ![key_icon]

The following page is displayed:

![Digital inputs and outputs](image)

*Main page - digital inputs and outputs*
Press the key
The following page is displayed:

Input page

Press the key
The following page is displayed:

Input page
Press the key.
The following page is displayed:

Set and delete digital outputs

Press the key.
The key turns green and the output is set.
User levels and access

Log-in

1. Press the key and a dialogue window will pop up
2. Enter name (USER) and password (e.g. user3 and u3)
3. If the name and password correspond, the system acknowledges it with the symbol
4. If the key is pressed again, the system logs out and the user panel is locked
5. The set-up of new user profiles is done on the first page under Konfig

User level 0

- The panel can be used without any limitation
- The level is reserved for specialized Gema staff
- After 3 minutes, the system logs out automatically

User level 1

- No configuration possible
- Plant parameters and object-related data (gun and axis data) can be modified
- After 30 minutes, the system logs out automatically
User level 2

- No configuration possible
- Plant parameters can not be modified
- Object-related data (gun and axis data) can be modified
- No automatic log out

User level 3

- No configuration possible in this level
- The user can only activate existing object data, modify the daily correction and deselect guns
- If no user is announced, the user panel is locked
- No automatic log out

No user level

Logged out status
Plant configuration

General information

Start page
Adjustments

Time, date, language, user, brightness

Press the key

The following page is displayed:

Main page configuration

1. Set time
2. Select system language German / English
   Important: restart OptiControl CM21
3. Select project language
   The following languages are available:

Languages

4. Show all users
5. Define new users
6. Delete users
7. Change password of current user
8. Adjust brightness
9. End visualization
10. System information
11. Select the input/output assignment option
12. Load or copy the configuration
   Backup of the configuration is filed under “99 Backup”

- General configuration parameters of the plant
- Station definition, axes and guns with system parameters
- Release the four available calibration options of the CAN bus sensor
- Booth definition
- Set type of object recognition
Schematic diagrams

Wiring diagram

OptiControl CM21 - wiring diagram

- Micro panel 5.7” Nr. 269 174
- Error acknowledgement
- Status lamp control voltage
- Key switch control voltage
- Emergency stop

External emergency stop clamps. Capacity: max. 240 VAC / 1 A

OptiControl CM21 - Schematic diagrams
Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

- Type and serial number of your powder coating equipment
- Order number, quantity and description of each spare part

Example:

- Type OptiControl CM21
  Serial no. 1234 5678
- Order no. 203 386, 1 piece, Clamp - Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this yard/meter ware is always marked with an *.

The wear parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

WARNING!
Only original Gema spare parts should be used as the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the Gema guarantee conditions!
# OptiControl CM21 - spare parts list

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>OptiControl CM21 - complete</td>
<td>1002 350</td>
</tr>
<tr>
<td>1 Micro Touch Panel - MC2-5,7&quot;, complete</td>
<td>1008 968</td>
</tr>
<tr>
<td>2 Key switch 3, central position</td>
<td>268 038</td>
</tr>
<tr>
<td>3 Switch lower part - complete, maker</td>
<td>267 821</td>
</tr>
<tr>
<td>4 Warning lamp - 24 VDC, white</td>
<td>268 070</td>
</tr>
<tr>
<td>5 Illuminated push button - red</td>
<td>267 880</td>
</tr>
<tr>
<td>6 Standard auxiliary switch - ZBE-102, breaker</td>
<td>267 805</td>
</tr>
<tr>
<td>7 Emergency stop button - Ø 40 mm</td>
<td>267 856</td>
</tr>
<tr>
<td>8 Switch lower part - complete, breaker</td>
<td>268 160</td>
</tr>
<tr>
<td>9 Internal CAN connection CM21</td>
<td>1001 828</td>
</tr>
<tr>
<td>10 Control signals connection AUX 2.3 - complete</td>
<td>1001 825</td>
</tr>
<tr>
<td>11 CAN OUT 2.6 connection - complete</td>
<td>1001 827</td>
</tr>
<tr>
<td>12 CAN IN 2.5 connection - complete</td>
<td>1001 826</td>
</tr>
<tr>
<td>13 Blind grommet - Ø 22,3 mm, black</td>
<td>203 653</td>
</tr>
<tr>
<td>14 CM21 adaptor</td>
<td>1001 806</td>
</tr>
<tr>
<td>15 Error push button cable set</td>
<td>1001 813</td>
</tr>
<tr>
<td>16 Warning lamp cable set</td>
<td>1001 812</td>
</tr>
<tr>
<td>17 Key switch cable set</td>
<td>1001 811</td>
</tr>
<tr>
<td>18 Emergency stop button cable set</td>
<td>1001 810</td>
</tr>
<tr>
<td>19 Touch Panel cable set</td>
<td>1001 814</td>
</tr>
<tr>
<td>20 Triple conductor end clamp - 6 mm</td>
<td>251 151</td>
</tr>
<tr>
<td>21 Triple conductor terminal - 2,5 mm², P</td>
<td>241 636</td>
</tr>
<tr>
<td>22 Triple conductor terminal end plate - 2,5 mm</td>
<td>241 660</td>
</tr>
<tr>
<td>23 Triple conductor terminal - 2,5 mm², PE</td>
<td>241 652</td>
</tr>
</tbody>
</table>
OptiControl CM21 - spare parts
OptiControl CM21 - spare parts (rear side)