WARNING!

The powder spraying equipment should only be started up and used once the operating instructions have been carefully studied.
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1 Electrostatic powder coating - Please observe the following guidelines:

- This equipment may be dangerous if the instructions in this operating manual are not followed.

- Please make sure you comply with local standards when erecting, revising and operating the plant.

- The operating instructions with regard to the recycling system, reciprocators and all other components of the plant must be followed.

- All electrically conductive parts within 5 meters of the coating area and in particular the workpieces, must be grounded.

- The floor in the coating area must be electrically conductive (normal concrete is generally conductive).

- The operating personnel must wear electrically conductive footwear (e.g. leather soles).

- A good metallic contact between the gun control unit, coating booth and conveyor chain or workpiece hangers is a prerequisite.

- The electrical and powder feed lines to the guns must be laid out in such a way that they are protected from possible mechanical damage.

- The powder coating equipment should only be switched on once the booth is in operation. If the booth stops, the powder coating device must switch off, too.

- The grounding of all electrically conductive parts has to be checked at least once a week.

- The earth leaking resistance of each workpiece must not exceed 1 mega-ohm. The condition of the workpiece fixtures as well as the suspension gear must ensure that the workpieces remain grounded. **Observation:** As workpieces are often grounded by metallic hangers, it is important that these hangers are cleaned regularly to avoid the build-up of isolating layers by melted coating powder.

- When cleaning the powder gun and when replacing nozzles the control unit must be **switched off**.
2 General operation

2.1 Automatic plant with PLC and touch-screen PC

The touch-screen PC is an operator unit, where all data and control commands for the automatic coating booth are directly entered "with a simple touch". The process control and process visualization simplify its operation. Symbols and action messages give optimum overview and control. All functions of the coating booth can be controlled and monitored via the touch-screen PC.

- Input errors are eliminated through process visualization.
- The operator is clearly led through the process.
- Symbols: Each operating mode has its corresponding symbol.
- All data can be retrieved or modified.
- Great flexibility, simple adaptation to new data.
- Action messages appear on the text display, which help the operator when searching for errors.
- Also legible under poor lighting conditions.
- IP 65 protection type version
- Multilingual version

The touch-screen PC is particularly suitable when using a PLC control system in a complex automatic powder coating installation with a wide variety of objects.

The communication and operating unit is generally built into the door of the PLC control cabinet. All pictures, touch logic and communication are directly stored in the touch-screen PC. The PLC control system is exclusively dedicated to the actual control task.

Process control and process visualization give the operator full overview and control of the whole coating sequence. Input errors are almost completely eliminated. Only valid keys appear on the display.

The touch-screen PC is an interactive communication terminal allowing at the same time data input, data retrieval and data modification.
2.2 Screen layout

In order to make its use as easy as possible, the screen is subdivided into functional fields. Each key is represented by a self-explaining symbol.
2.2.1 Information

The top line displays important information.

- **Date / Time**: The screen always displays the current date and time set on the PC.

- **Alert messages**: The screen always displays the last two active alert messages. In the case of more alert messages, they are displayed in the alert page.

- **Alert page**: This key opens the alert page. *(See chapter Alert message)*

- **Log-in**: The padlock key opens the log-in window. Here the operator can log in according to the corresponding authorization. The padlock shows if somebody has already logged in (padlock closed or open). If the padlock is open, activate the padlock to log out. The user level shows who has logged in.

- **User level**: The user level field shows who has logged in and with which user level. There are 5 different user levels, which are displayed in different colors.
  - **None**: gray
  - **Coating**: green
  - **Programming**: yellow
  - **Service**: violet
  - **Configuration**: red
2.2.2 Functions

The different operating modes of the plant can be selected with the keys mentioned below.

The following operating modes can be set: Off, Reference, Manual, Automatic, Cleaning and Service. The active operating mode is shown by the corresponding frame. The operating modes are described in detail in the chapter Operating modes.

Operating mode - off

Operating mode - reference

Operating mode - manual

Operating mode – semi-automatic

Operating mode – semi-automatic

Operating mode - cleaning

Operating mode - service
2.2.3 Navigation

Depending on the operating mode, further navigation possibilities are available. These are described in the corresponding operating modes (Chapter Operating modes). The following keys are shown in all operating modes.

**Exit**: The Exit key always returns to the previous mask or closes the pop-up window.

**Door**: This key is only shown when automatic doors have been configured.

**Cone cap**: This key is only shown when the cone cap has been configured.

**Stopper 1**: Press this key first. A pop-up window (see below) appears, where you can choose if the stopper will open once, i.e. for one crossing, or for various crossings. When the red cross is displayed, the stopper is closed.

The same applies to stopper 2.
2.2.4 Display

Depending on the navigation call-up, the display shows the plant in different views: general view, detailed view, parameters, alert messages etc. For detailed description, please refer to the chapters below. The different plant elements are shown as symbols and the coloring indicates in what mode they are currently running.

- Not in operation: gray
- In operation: green
- Fault: red

- **Powder cloud**: As soon as the gun starts spraying in the corresponding gun row, the blue powder cloud appears.
- **Speed**: Here the current speed is displayed. Depending on the configuration, it is possible to modify the nominal speed. *See mask NOMINAL SPEED.*
- **Chain conveyor**: When in operation, the chain conveyor is displayed in an animated form.
- **Door**: The position of the doors is visually displayed.
- **Light grid**: Objects located in the light grid are displayed in green.
- **Object code**: Here is shown if an object code is active or if it does exist at all.
**Nominal Speed**

- **Nominal speed**: The nominal speed can be modified in all operating modes except for the automatic mode.
3 Plant operation

3.1 Start-up

After the coating booth is switched on by the main switch at the control cabinet, the control unit is turned on and the PC booted up. Various background programs (needed for the communication with the PLC (MBNET) and the alert history (MSSQL Desktop Engine) are started. The START mask is displayed (see below) and the plant is ready.

START

- **Plant operation**: Pressing the screen outside the control cabinet picture leads to the plant operation and the main menu appears.
- **Language switch and configuration**: By pressing the picture of the control cabinet (see picture: a frame appears) more than 3 seconds, the language switch and configuration appear. See Language switch and configuration.
3.2 Switch-off

The whole plant can be switched off by the main switch at the control cabinet. Please note that an internal logic will then shut down the PC and turn it off after a certain period of time.

Attention: In case of problems of any kind, please make sure that the plant is only switched on again after the PC has actually been turned off.

3.3 Operating mode - off

If the control voltage is not turned on, the operation on this mask is blocked. The start-up can not be completed. Axes, ventilation and OptiTronic are switched off.

Depending on the configuration, the plant can only be further operated from this mask once somebody with a minimal authorization level has logged in.
3.4 Operating mode - reference

In this operating mode, all axes travel to a preset starting point. References can be set individually, globally, per station or per single axis.

Once all axes are referenced, the operating mode automatically changes to Manual and loads the last object.

- **Reference operation start**: Here the axes are referenced one after the other or all together.
- **Reference operation Stop**: This key stops the reference operation.
- **Reference station start**: By pressing this key, the axes of the corresponding station are referenced.
- **Call-up axis mask**: By selecting the station, you gain access to the corresponding station.

*See mask REFERENCE STATION*
Reference axis

- **Reference axis**: By pressing this key, each axis can be referenced individually.
3.5 Mode contours

Easy mode means that the plant is operated with simple stroke movements. In most of the Easy mode applications, the object is recognized by means of the light grid. The X axes travel to the set value and the Z axes swing back and forth as long as the object is recognized. The guns spray with the set values and, if necessary, switch on or off.

Below are described the operating modes Manual, Semi-automatic and Automatic, which can be run in Easy mode.

**Guns on/off**: In the operating modes Manual and Semi-automatic, all pre-selected guns can be switched on and off by pressing this key. The key shows the current switch status. In the automatic operating mode, this key is not displayed.
• **Call-up gun mask**: When this mask is called up, gun data can be edited. See *Edit guns in the operating modes Manual, Semi-automatic and Automatic*.

• **Call-up axis mask**: When this mask is called up, axis data can be edited and the axes can be started and stopped depending on the operation mode. See *Edit axes in the operating modes Manual, Semi-automatic and Automatic*.

• **Call-up station mask**: When this mask is called up, day corrections and various station-related data can be edited. See *Edit station parameters in the operating modes Manual, Semi-automatic and Automatic*.

• **Call-up explorer mask**: When this mask is called up, new objects can be created and deleted. See *Object data explorer*.

### 3.5.1 Operating mode Manual in Easy mode

The plant is switched into manual mode. The booth is switched on and in the case of booths without powder center, the powder is prepared for coating. In the case of booth types with powder center, the powder center is released for start-up. Object data can be loaded and axis, gun and station data modified. Each axis can be individually positioned or moved. Guns can be individually pre-selected and get ready for the spraying process. The light grid is inactive.

### 3.5.2 Operating mode Semi-automatic in Easy mode

The plant is switched into semi-automatic mode. The booth is switched on and in the case of booths without powder center, the powder is prepared for coating. In the case of booth types with powder center, the powder center is released for start-up. Object data can be loaded and axis, gun and station data modified. Each axis can be individually positioned or moved. Guns can be individually pre-selected. The light grid is inactive.

When the chain conveyor is operating, the spraying process is activated and the parts coated provided that the key “Guns on/off” is activated. When the chain conveyor stops, the axes in motion stop and the guns stop spraying. When the chain conveyor is started up again, the axes and guns return into their previous operating mode.

### 3.5.3 Operating mode Automatic in Easy mode

The plant is switched into automatic mode. The booth is switched on and in the case of booths without powder center, the powder is prepared for coating. In the case of booth types with powder center, the powder center is released for start-up. Object data can be loaded and axis, gun and station data modified. Guns can be individually pre-selected. As a rule, all guns are selected.

With the light grid, all parts are recognized and analyzed accordingly. Based on the read in data, length, height and width, the X axes travel to the corresponding positions and the Z axes start. The guns start spraying. At the end of the object and in the case of a sufficiently big gap, the axes are stopped and the guns stop spraying.

When the chain conveyor stops, the axes in motion stop and the guns stop spraying. When the chain conveyor is started up again, the axes and guns return into their previous operating mode.
3.5.4 Edit guns in the operating modes Manual, Semi-automatic and Automatic

- **Select gun data**: Each gun can be individually selected or deselected. The selection is connected in series prior to the light grid, this means: In manual and semi-automatic mode, the guns only spray when selected. In automatic mode, the guns only spray if the gun is selected and the light grid data of the assigned gun activated. Modifications are stored in the corresponding object.

- **Edit guns**: Gun data can be edited on the OptiTronic. Modifications are stored in the corresponding object.

- **Powder output** 0 .... 100 %
- **Air volume** 0; 1.8 .... < 8.0 Nm³/h
- **Electrode rinsing air** 0 .... < 2.8 Nm³/h
- **High-voltage** 0; 10 .... 100 kV
- **Spraying current** 0 .... 100 microA
• **Copy gun data**: A pop-up window appears to copy gun data. See mask GUN DATA

![GUN DATA Diagram]

- **Source**: The gun number of the data to be copied has to be entered into this field. The first gun is automatically displayed. All displayed gun data is copied.
- **Objective first gun**: First gun, into which data is copied.
- **Objective last gun**: Last gun, into which data is copied.
- **Copy gun data**: All displayed gun data is copied.
3.5.5 Edit axes in the operating modes Manual, Semi-automatic and Automatic

- **Start/Stop**: By pressing this key, swing axes can be started and stopped. Positional axes travel to the set position. This key is only displayed in manual and semi-automatic operating mode.

- **Back/forth**: These keys move the axes in the direction of the arrow. They can only be selected in Manual operating mode.

- **Target position**: If the axis is configured as a positioning axis, the axis has only one input field called target position. The axis travels to this value, when the start key is pressed.

- **Swing positions**: If the axis is configured as a swing axis, the axis has two input fields called swing positions. As soon as the axis is started, it swings back and forth between these two values. In manual and semi-automatic mode, the axes have to be started manually. In automatic mode, this key is not displayed and the axes start automatically as soon as the object data has been read in.

- **Speed**: The system operates at the set speed when traveling by pressing the start key or in automatic mode.

- **Actual position**: This field displays the actual position of the axis.
3.5.6 Edit station parameters in the operating modes Manual, Semi-automatic and Automatic

Station parameters

- **Correction factor powder output (%)** The correction factor of the powder output is set against the powder output and transmitted to the guns. Depending on the configuration, the correction value is applied per station or to the whole plant. The powder output values of the active object are not modified. The correction value applies to all objects.

- **Correction factor spraying current** The correction factor of the spraying current is set against the spraying current and transmitted to the guns. Depending on the configuration, the correction value is applied per station or to the whole plant. The powder output values of the active object are not modified. The correction value applies to all objects.

Attention: If a powder output value or a spraying current value is already very high and multiplied with a day correction larger than 100, the output might be limited by the gun control unit. If this is the case only for isolated guns, a non linear increase of the output is achieved by increasing the day correction.

- **Coating distance**: The coating distance is the distance between the read-in object and the gun tip. The coating distance is only active in automatic operation.

- **Flat part position**: If the plant is equipped with a width light grid, this grid creates, when activated, a dead zone in the chain conveyor system. If the height light grid detects neither an object nor the width light grid, the axes travel into the flat part position. The flat part position is the distance between the booth (chain conveyor) and the gun tip. The flat part position is only active in automatic operation.
3.5.7 Object data explorer

- **Object code**: This key opens the mask Object code.
- **Read in code**: By pressing this key, the read-in process can be switched on and off. See *Object code*.
- **Object administration**: Any tree structure can be created in the object administration.

  By pressing the **New** key, new directories and sub-directories can be created. These are only maintained, if at least one object is created in the object folder. Otherwise, it is automatically removed when exiting the explorer.

  By pressing the **Cancel** key, directories can be removed Only the last directory in the tree structure can be removed. If a directory is removed, the objects contained are cancelled.
- **Object folder**: An unlimited number of objects can be created in the object folder. Each object name can only be used once.

  By pressing the **New** key, new objects can be created. See mask **NEW OBJECT OR EDIT OBJECT**.

  By pressing this key, the object description etc. can be modified. See **NEW OBJECT OR EDIT OBJECT**.

  By pressing the **Copy** key, the objects are copied with the corresponding coating and axis data. The copy function can only be used together with the **Paste** key.

  By pressing this key, the selected object is cut and can be dragged to another directory. The copy function can only be used together with the **Paste** key.

  If an object has been previously copied or cut, it can be pasted in the selected directory by pressing the **Paste** key. If an object has been copied, a new name has to be entered for the pasted object.

  By pressing the **Delete** key, the objects can be deleted. They are permanently deleted.

  In Easy mode, the **Print** key is not active yet.

  By pressing this key, a pop-up window is opened and coating and axis data loaded on the PLC. See mask **LOAD OBJECT**
NEW OBJECT OR EDIT OBJECT

- **Article**: The object name is entered into this field. This object name can only be assigned once.
- **Description**: In this field an additional text can be entered, which serves as information only.
- **Nominal speed**: If the **Nominal speed** is displayed, the nominal speed must be entered into this field. When downloading to the PLC, the nominal speed is transmitted to the chain conveyor. As a result, the chain conveyor speed is adapted to the loaded object.

When entering object data, please note that the same length, width and height with or without piggyback can only be assigned once. This guarantees an unambiguous identification of the object via the light grid recognition.

- **Object dimension piggyback**: This field is ticked, if two boxes of the same dimension are hung one onto the other.
- **Object dimension length**: In this field the length of the object to be coated is entered. The length is the dimension viewed in the conveying direction.
- **Object dimension width**: In this field the width of the object to be coated is entered. The width is set equal to the width light grid.
- **Object dimension height**: In this field the height of the object to be coated is entered. The height is set equal to the height light grid.
Load object configuration

- **Load object**: By pressing this key, the object data is loaded onto all stations. The pop-up mask *LOAD OBJECT* appears until all stations are loaded.
3.5.8 Object data object code

- **Sort**: Each column can be sorted in alphabetical and reverse alphabetical order.
- **Select**: The desired line is selected by a simple touch. The selected line is marked by the sign ">".
- **Edit object**: Once a line has been selected, this key opens a pop-up window, where data can be edited. *See mask PROPERTIES.*
- **Filter**: In the “Filter” field the current filter is displayed. A previously entered filter can be selected.
- **Filter new**: With the key „Filter new“, a new filter is created, i.e. by entering letters and numbers, only those objects are displayed in the lines, which are identical with the entry in the filter.
- **Delete filter**: When a filter is active, it can be deactivated by using the key “Delete filter“.
- **Nominal speed**: By selecting this window, the nominal speed can be modified.
- **Object code**: In this field the code for the object can be entered. Only an unambiguous object code is entered.
3.6 Sequence mode

Sequence mode means the axes and guns are programmed as a sequence control and switched on and off accordingly.

**MANUAL**

- **STOP** : The stop key is only displayed in the manual mode. All sequence programs are aborted with this key.
- **Start/stop** : By pressing this key, each station can be individually started or stopped.
- **Call-up station mask** : By opening this mask, the day corrections can be edited (see Edit station parameter in the operating modes Manual and Automatic).
- **Call-up explorer mask** : By opening this mask, new objects can be created and deleted (see Object data explorer).
3.6.1 Edit station parameters in the operating modes Manual and Automatic

Station parameters

<table>
<thead>
<tr>
<th>Stations parameter</th>
<th>Station : A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>🍼 : 100 %</td>
</tr>
<tr>
<td></td>
<td>µA : 100 %</td>
</tr>
</tbody>
</table>

In the sequence mode only the day corrections are displayed.

- **Correction factor powder output**: The correction factor of the powder output is set against the powder output and transmitted to the guns. Depending on the configuration, the correction value is applied per station or to the whole plant. The powder output values of the active object are not modified. The correction value applies to all objects.

- **Correction factor spraying current**: The correction factor of the spraying current is set against the spraying current and transmitted to the guns. Depending on the configuration, the correction value is applied per station or to the whole plant. The spraying current values of the active object are not modified. The correction value applies to all objects.

Attention: If a powder output value or a spraying current value is already very high and multiplied with a day correction larger than 100, the output might be limited by the gun control unit. If this is the case only for isolated guns, a non-linear increase of the output is achieved by increasing the day correction.
3.6.2 Object data explorer

- **Object code**: This key opens the mask Object code.
- **Read in code**: By pressing this key, the read-in process can be switched on and off. See Object code.
- **Object administration**: Any tree structure can be created in the object administration. By pressing the **New** key, new directories and sub-directories can be created. These are only maintained, if at least one object is created in the object folder. Otherwise, it is automatically removed when exiting the explorer.

By pressing the **Cancel** key, directories can be removed. Only the last directory in the tree structure can be removed. If a directory is removed, the objects contained are cancelled.
• **Object folder**: An unlimited number of objects can be created in the object folder. Each object name can only be used once.

By pressing the **New** key, new objects can be created. See mask **NEW OBJECT OR EDIT OBJECT**.

By pressing this key, the object description etc. can be modified. See mask **NEW OBJECT OR EDIT OBJECT**.

By pressing the **Copy** key, the objects are copied with the corresponding coating and axis data. The copy function can only be used together with the **Paste** key.

By pressing this key, the selected object is cut and can be dragged to another directory. The copy function can only be used together with the **Paste** key.

If an object has been previously copied or cut, it can be pasted in the selected directory by pressing the **Paste** key. If an object has been copied, a new name has to be entered for the pasted object.

By pressing the **Delete** key, the objects can be deleted. They are permanently deleted.

By pressing the **Print** key, all sequence programs of all stations of the selected object are printed, provided that a printer is connected.

By pressing this key, a pop-up window is opened and coating and axis data loaded on the PLC. See mask **LOAD OBJECT**.

This key opens the editor mask. Here sequence programs and gun data can be created and edited. See **Object data editor**.
NEW OBJECT OR EDIT OBJECT

- **Article**: The object name is entered into this field. This object name can only be assigned once.

- **Description**: In this field an additional text can be entered, which serves as information only.

- **Nominal speed**: If the Nominal speed is displayed, the nominal speed must be entered into this field. When downloading to the PLC, the nominal speed is transmitted to the chain conveyor. As a result, the chain conveyor speed is adapted to the loaded object.

When entering object data, please note that the same length, width and height with or without piggyback can only be assigned once. This guarantees an unambiguous identification of the object via the light grid recognition.

- **Object dimension piggyback**: This field is ticked, if two boxes of the same dimension are hung one onto the other.

- **Object dimension length**: In this field the length of the object to be coated is entered. The length is the dimension viewed in the conveying direction.

- **Object dimension width**: In this field the width of the object to be coated is entered. The width is set equal to the width light grid.

- **Object dimension height**: In this field the height of the object to be coated is entered. The height is set equal to the height light grid.
**LOAD OBJECT**

- **Load object** By pressing this key, the object data is loaded onto all stations. The pop-up mask `LOAD OBJECT...` appears until all stations are loaded.
3.6.3 Object data editor

The editor represents a simple line orientated sequence programming language.

A program line contains exactly one action, which is to be carried out during the transition to this step. The individual program lines are processed consecutively. Additional commands permit the synchronization of the program sequence with events, like wait times, axis positions and repetitions of loops.

**EDITOR**

- **Station start** : When this key is displayed, a program has been loaded onto the station and can be started by pressing the key.

- **Stop** : By pressing this key, the program is interrupted or stopped.

The **New** key adds a new program line. *See mask NEW PROGRAM LINE OR EDIT PROGRAM LINE.*

By pressing the **Edit** key, a selected program line can be edited. *See mask NEW PROGRAM LINE OR EDIT PROGRAM LINE.*
The **Copy** key copies the selected program line. The copy function can only be used together with the **Paste** key.

If a program line has been previously copied, it can be pasted with the **Paste** key in the sequence program. The pasted line is always inserted above the selected line.

By pressing the **Delete** key, the selected line can be deleted. After a security query, the line is irrevocably deleted.

The selected program line is dragged upwards.

The selected program line is dragged downwards.

The currently opened station program can be exported into another station. See mask **EXPORT**.

In this selection window the user can change to another station.

By pressing the **Print** key, the displayed sequence program is printed provided that a printer is connected.

This key loads the sequence program on the PLC. During the loading process, a pop-up window appears.
NEW PROGRAM LINE OR EDIT PROGRAM LINE

- **Command**: Here can be selected the desired command.
- **Properties**: Depending on the command, other properties appear in which the desired parameters are entered.

**EXPORT**

The currently opened station program can be exported into another station.
- **Station**: Here can be selected the desired command. Possible commands (see below).
- **Non defined axes...**: Here can be selected, what should be done with non defined axes.
### 3.6.4 Commands sequence programs

Here are described all commands with their functions, which can be used in the sequence mode.

- **GoAbs**:
  - Parameters: Axis [Selection of the configured axes]
  - Position
  - Speed [m/s]
  - Description: Position axis on absolute position

  This command starts the absolute positioning on the axis. Program processing does not wait until the position is reached, so several axes which apparently start to move at the same time can be started consecutively with this command. The setting and monitoring of an intermediate position with a WaitPoint is possible after this command.

- **GoCont**:
  - Parameters: Axis [Selection of the configured axes]
  - Position 1 [mm]
  - Position 2 [mm]
  - Speed [m/s]
  - Description: Start of the continuous stroke movement

  This command starts the stroke movement, which consists of a continuous up and down movement, in the frequency converter. The parameter end points and speed are defined in the program. The movement is only terminated with a program stop via the panel (manual operation) or the sequence control (automatic operation).

- **GoInkr**:
  - Parameters: Axis [Selection of the configured axes]
  - Position
  - Speed [m/s]
  - Description: Position axis incrementally (chain dimension)

  This command starts an incremental positioning of the axis. Program processing does not wait until the position is reached, so that several axes can be started consecutively with this command.

- **LoopEnd**:
  - Parameters: Loop level [1...9]
  - Description: End of the program loop

  The command represents the end point of a program loop (NEXT to FOR). The connection with the appropriate "LoopSt" is made through the loop index.

- **LoopSt**:
  - Parameters: Loop level [1...9]
  - Number of circuits [0...999]
  - Description: Start of a program loop with n repetitions

  This command represents the beginning of a program loop according to a FOR-NEXT loop. Nesting of up to 9 program loops is possible. The individual loop levels are defined by the loop index. The number of repetitions of loops is variable, a number=0 causes a continuous loop.

- **ProgEnd**:
  - Parameters: ---
  - Description: End of the station program

- **RobStart**:
  - Parameters: Axis [Selection of the configured axes (robot)]
• **SetGunOn** : Parameters  
  first gun [1...16]  
  last gun [1...16]  
  last gun [1 / 0]  

Description: Start or end of spraying area.  
This command switches a gun group on or off. At the start-up the guns are activated in the last loaded program values in the last selected program number.

• **SetGunProg** : Parameters  
  Program number (1... 16)  
  Gun number [1...16]  
  Powder output [0...100%]  
  Total air [0,1.8...8m³/h]  
  Electrode rinsing air [0...2m³/h]  
  Vortical air [3...6m³/h]  
  High voltage [0,10...100kV]  
  Spraying current [0...100µA]  

Description: Load coating parameters  
This command operates the OptiTronic control unit and loads a complete set of coating parameters for one gun. As a result, one gun unit is prepared for its start.

• **SetOffset** : Parameters  
  Offset [+/- 2000mm]  

Description: A start offset is set for this coating station. An offset to the configured starting point is added or subtracted in order to start the coating object-dependent earlier or later.

• **SetOut** : Parameters  
  Output number [1...16]  
  On/Off [1 / 0]  

Description: A signal can be switched with this command.  
16 logical outputs are assigned to each station, which can be switched in the program sequence. These signals can be set on hardware outputs or flags in the control configuration.

• **SetSem** : Parameters  
  ---  

Description: Set the release of the station

• **SetUPosDefOn** : Parameters  
  ---  

Description:

• **SynchOff** : Editing parameters  
  ---  

Description: Terminate synchronous travel  
Terminates the synchronous travel of the corresponding axis.

• **SynchOn** : Parameters  
  ---  

Description: Start synchronous travel

• **SynchOn** : Parameters  
  Time [1...1000ms]  

Description: Start synchronous travel
• **WaitPuls**
  
  **Parameters**
  - Time [1...1000]

  **Description**
  Wait pulse

  The command "WaitPulse" includes a wait pulse into the program. The program continues to process the following command only after the set number of pulses.

• **WaitPnt**
  
  **Parameters**
  - Axis [selection of the configured axis]
  - Position
  - Speed [mm/s]

  **Description**
  Wait at the intermediate position

  This command permits the synchronization of the program sequence on overriding a certain position on an axis. This command sets the transferred absolute position as intermediate position on the axis and waits until the feedback signal arrives that the position has been overridden. The command can take effect only after a "GoAbs". The commands, which follow the command "WaitPnt", are only processed when the position on the axis has been overridden.

• **WaitTime**
  
  **Parameters**
  - Time [n* 100ms]

  **Description**
  Wait time interval

  The command "WaitTime" inserts one standby time of n x 100 ms into the program sequence. The program continues to process the following command only after this time has elapsed.

• **WaitTrs**
  
  **Parameters**
  ---

  **Description**
  Wait for the positioning of the traveling axes

  This command must be inserted whenever after a "GoAbs" or a "GoInkr" has to be waited for the positioning of the axes. Without this command the next command is processed immediately after the start of the positioning. The command following the "WaitTrs" command is only carried out if all axes of the station are in the desired position. The axis arriving later must not be stopped if it is to be used in the next sequence.
3.6.5 Object data object code

- **Sort**: Each column can be sorted in alphabetical and reverse alphabetical order.
- **Select**: The desired line is selected by a simple touch. The selected line is marked by the sign "->".
- **Edit object**: Once a line has been selected, this key opens a pop-up window, where data can be edited. See mask PROPERTIES.
- **Filter**: The display window Filter displays the current filter. It is possible to change the filter by selecting a previously entered one.
- **Filter new**: With the key Filter new, a new filter is created, i.e. by entering letters and numbers, only those objects are displayed in the lines, which are identical with the entry in the filter.
- **Delete filter**: When a filter is active, it can be deactivated by using the key Delete filter.
**PROPERTIES**

- **Nominal speed**: By selecting this window, the nominal speed can be modified.
- **Object code**: In this field the code for the object can be entered. Only an unambiguous object code is entered.
3.7 Operating mode - Cleaning

- **Ring rinsing**: In the cleaning operation, the ring rinsing pipe can be activated or deactivated. As a result, the powder can be removed more efficiently when cleaning the booth manually.

- **Inner cleaning**: All axes travel towards the booth into the cleaning position. Subsequently, the cleaning cycle for the powder center is released. Now the cleaning of the guns and powder hoses at the powder center can be started.

- **Outer cleaning**: All axes travel to the booth. For automatic cleaning, each station travels then individually away from the booth during the blow-off process. All guns are blown off from the outside.

- **Editor inner cleaning**: Pressing this key leads to the Editor. Here the inner cleaning programs can be created and adapted.

- **Editor outer cleaning**: Pressing this key leads to the Editor. Here the outer cleaning programs can be created and adapted.
3.8 Error messages

During operation failures may occur. These failures or operation messages are registered with date and time. The messages are indicated by the bell symbol on all masks of the main operating modes.

- **Alert messages**: If a failure occurs, it can be deferred with this key. If the message is still displayed, the error has not been eliminated.
- **Alarm horn**: The alarm horn can be acknowledged with this key.
- **Error history**: Pressing this key leads to the display of the error history. See mask ERROR HISTORY.
This mask can only be accessed if logged in with programming level or higher.

**ERROR HISTORY**

- **Current errors**: Pressing this key returns the user to the current error. See mask CURRENT ERRORS.
- **Number of error messages**: Here the number of error messages can be reduced or increased. A maximum of the last 1000 messages can be displayed provided that they are not older than 1 week.
- **Duration error messages**: Here the time slot can be reduced or increased.
- **Help**: By selecting the error in the alarm window and by pressing the Help key, a PDF file is opened that describes in detail the error. For the moment, a PDF file is only opened in the case of axis and gun errors. See mask HELP.
Origin and error repair are described in the PFF file. It offers the user the possibility to rapidly localize and troubleshoot the error.

- Close help: To go back to the operation mode, the PDF file has to be closed with the cross at the top on the right.
3.9 Service

- **Axes**: Pressing this key allows the user to move the axes and to create the crash programs. See mask **SERVICE AXES**.
- **Powder guns**: Here the user has the possibility to move the guns with the axes and to create crash programs. See mask **SERVICE GUNS**.
- **Booth**: Here the user can test and set the booth functions. See mask **SERVICE CIRCUIT**
- **Circuit**: Not active at the moment.
- **Operating hours**: Here the user has the possibility to check and reset the operating hours. See mask **SERVICE OPERATING HOURS**.
- **I/O Test**: Not active at the moment. See mask **SERVICE I/O TEST**.
SERVICE AXES

• **Crash**: Pressing this key leads to the Editor. Here the user can create and modify the crash reset programs for each station. Creation of the programs see **OBJECT DATA EDITOR**.

• **Call-up axis mask**: When this mask is called up, axis data can be edited and axes started and stopped depending on the operating mode. **Object Manual** is called up. See **Edit axes in the operation modes Manual, Semi-automatic and Automatic**.
• **Call-up gun mask**: When the gun mask is called up by selecting the guns, the parameters of the **Powder hose correction** and/or **Reference** can be modified depending on the pre-selection of the keys.

**Powder hose corrections**: When this key is active and the gun mask selected, the powder hose correction values can be modified. See mask **POWDER HOSE CORRECTION**.

**Reference**: When this key is active and the gun mask selected, each gun can be referenced when selected.

**Remote**: When this key is active, the remote function of the guns is switched off and the user has the possibility to modify data and parameters directly on the gun.
**Guns on/off**: In the operating modes Manual and Semi-automatic, all pre-selected guns can be switched on and off with by pressing this key. The key displays the current switch state. In automatic operation, this key is not displayed.

**Weigh out**: By selecting this key, the pop-up window *Weigh out* is called up. See mask *WEIGH OUT*.

**Spraying time**: Here the spraying time can be modified. Setting ranges from 60 to 180 seconds. Preset time is always 60 seconds.

**Remaining spraying time**: Here the remaining spraying time is displayed.

**Start/stop spraying**: By selecting this key, all selected guns spray during the set time. The spraying process can be interrupted by pressing the key again.
POWDER HOSE CORRECTION

Gun correction

- **Powder hose correction**: Here the corrections can be modified. They are written on the OptiTronic.
- **Gun correction**: Here the mask *Gun correction* is called up. *See mask GUN CORRECTION.*
### GUN CORRECTION

<table>
<thead>
<tr>
<th>Weight</th>
<th>New correction value</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 g</td>
<td>86 %</td>
</tr>
<tr>
<td>95 g</td>
<td>100 %</td>
</tr>
<tr>
<td>125 g</td>
<td>76 %</td>
</tr>
</tbody>
</table>

- **Weight**: Here the weight of the powder released during the spraying time can be entered for each gun. It is automatically calculated and entered in the new powder hose correction value.

- **New correction value**: Once all weights are entered, all powder hose corrections are newly calculated. Here they can be edited again before transmitting them.

- **Copy**: By selecting the key *Copy*, the new powder hose correction values are transmitted to the previous ones and subsequently written on the OptiTronic unit. If the new powder hose correction value is 0, the old value is not overwritten.
**SERVICE BOOTH**

**Encoder**

- **Encoder**: Here the encoder can be tested and adapted. *See ENCODER TEST.*
- **Object recognition**: Depending on the configuration, the light grid can be checked as to its operability.

**ENCODER TEST**

<table>
<thead>
<tr>
<th>Encoder Test</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lückeinstellung</td>
<td>ВДС</td>
</tr>
<tr>
<td>aktuelle Fördergeschwindigkeit</td>
<td>0.0 mm/min</td>
</tr>
<tr>
<td>Inkremente pro Messstrecke</td>
<td>0 Inkremente</td>
</tr>
<tr>
<td>Weg pro Takt</td>
<td>10 mm</td>
</tr>
<tr>
<td>Messstrecke</td>
<td>1000 mm</td>
</tr>
<tr>
<td>Vorzeichenwechsel</td>
<td>+</td>
</tr>
</tbody>
</table>
SERVICE OPERATING HOURS

- **Operating hours**: Here the operating hours can be checked. Displayed after selection of the corresponding object. See **OPERATING HOURS**.

**OPERATING HOURS**

<table>
<thead>
<tr>
<th>Betriebsarten</th>
<th>Betriebsstunden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand</td>
<td>94.6 h</td>
</tr>
<tr>
<td>Semi Automatik</td>
<td>0.8 h</td>
</tr>
<tr>
<td>Automatik</td>
<td>92.9 h</td>
</tr>
<tr>
<td>Reinigung</td>
<td>10.0 h</td>
</tr>
</tbody>
</table>

- **Total hours**: Here the total hours are displayed. This data can only be reset in the case of an equipment replacement by ITW Gema.

- **Service hours**: These hours can be reset after a service. As a result, the user always knows how many hours the elements have been in operation since the last service.
SERVICE I/O TEST

- **I/O CEDIO**: This symbol leads to the I/O CEDIO. *See mask I/O CEDIO*
- **I/O booth**: This symbol leads to the I/O booth. *See mask I/O WAGO*
- **I/O light grid**: This symbol leads to the I/O light grid. *See mask I/O WAGO*
**Inputs** : Each input is numbered and the display shows if it is switched on or off: green = 1, gray = 0.

**Outputs** : Each output is numbered and the display shows if it is switched on or off. By selecting the corresponding output, it can be switched: green = 1, gray = 0.
4 Language switch and configuration

4.1 Information window and language selection

- **Plant information**: Here important information for the client and service is displayed. The window displays the customer code and the current software version, which is operating the plant.

- **Contact information**: Here ITW Gema’s address and phone number are displayed.

- **Password**: This key leads to the password. See Authorization and password

- **Configuration**: This key leads to the plant configuration. This mask is not described in detail, as it is a plant-specific configuration and only created and modified by ITW Gema.
• **Language**: The desired language can be selected. Currently the following languages are active:
  - Czech = cesky
  - German = deutsch
  - English = English
  - Spanish = español
  - Basque = euskara
  - Italian = italiano
  - Portuguese = portuguese

This key opens a special screen cleaning mask. *See mask SCREEN CLEANING.*

This key opens a window, where the password of the current user can be changed. *See mask PASSWORD CHANGE.*

This key opens a data back-up mask. *See mask DATA BACK-UP.*

This key leads to a mask, where various software tools can be opened. *See mask PROGRAM TOOLS.*

This key reduces the operating software and all other open program tools allowing use of general Windows functions.

The „Intouch“ program for the operation of the plant is terminated.

Before switching off the PC, Windows has to be closed. Therefore, this function is not protected by a password. A pop-up window will be called up to confirm the closure.
This mask allows the operator to clean the screen without switching it on or off unintentionally. To exit this mask, the key in the center of the screen has to be pressed until the mask has changed.

CHANGE PASSWORD

Here the password can be changed. The new password has to be entered twice.
• **Date/time**: This key calls up the window *Date/time* Windows 2000. Date and time can be modified.

• **Data back-up**: Data can be backed up with this mask. See mask BACK UP DATA.
• **Start data back-up**: This key starts the back-up process. The mask can not be exited during the back-up process.

• **Directory data back-up**: The window always displays the disk drive and the directory “D:\Original”. Disk drive and directory must be valid, i.e. they have to exist in Windows, otherwise the data back-up can not be carried out.

• **Name data back-up**: The back-up name is always “GematicPC_” + “Year” + “Month” + “Day” + “.mdb”. This allows the operator to manually create a daily data back-up.
This screen allows the operator to call up various programs for debugging and troubleshooting.

MBENET : Modbus I/O server This program is responsible for the connection between the PC and the Gematic control unit.

CNW : Control. This program is needed to set the node ID and IP address. Firmware and diagnosis statuses of the Gematic control unit can be selected.

CP 1131 : This program allows the operator to monitor and to reload the Gematic software.

Wago I/O Pro : This program allows the operator to monitor and to reload the Wago software. It requires a special serial cable to establish the connection to the Wago knot.

Wago I/O check : This program allows to check the hardware of the Wago knots. This requires a special serial cable to establish the connection to the Wago knot.
Lust Drivemanager: This program allows the operator to check the Lust Drive and to load specific software.

WinPLV: This program allows the operator to monitor and to reload the Reglomat light grid. This requires a special serial cable to establish the connection to the light grid.
4.2 Authorizations and password

**Authorization** : In the authorization field user levels and automatic disconnection times can be changed. As a standard, the user levels are set as in the mask “Authorization”. To avoid compulsory log-in, the user level can be modified for example from 2000 to 0. If the automatic disconnection time is set to 0, the user has to log off manually, otherwise the system will log off automatically after the set time.

**System resources** : The system resources show, which drive disk has how much available free space.

- **This key opens a window, in which the operator can change the password of the current user. See mask PASSWORD CHANGE.**

- **This key opens a pop-up window, in which users and passwords can be added and modified. See mask USERS AND PASSWORD.**
New users can be defined or modified, existing users can be removed. This function is limited to users with **Programming** level or higher. Only users and passwords can be modified or removed which are equal to or lower than the logged-in level.
## 5 Axis error messages

### 5.1 Error code 1 CPU

<table>
<thead>
<tr>
<th>Fault</th>
<th>Reaction</th>
<th>Cause</th>
<th>Possible solution</th>
</tr>
</thead>
</table>
| 0     | CPU      | RESET | Faulty processor or wrong software version | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |
| 6     | CPU      | RESET | Error in cache memory of the serial EEPROM | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |
| 8     | CPU      | RESET | Error during auto-test: Parameter initialization failed due to incorrect parameter description. | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |
| 17    | CPU      | RESET | RAM area for scope functionality not sufficient | 1. Switch appliance off/on.  
2. If this error should occur again, please contact your service partner. |
| 44    | CPU      | RESET | Timeout during parameter identification | 1. Switch appliance off/on.  
2. If this error should occur again, please contact your service partner. |
| 55    | CPU      | RESET | Incorrect program memory data | 1. Switch appliance off/on.  
2. If this error should occur again, please contact your service partner. |

### 5.2 Error code 2 OFF

<table>
<thead>
<tr>
<th>Fault</th>
<th>Reaction</th>
<th>Cause</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>Intermediate circuit voltage &lt; 212/425 V (also displayed in the case of normal mains failure)</td>
<td>Troubleshoot power failure or connect higher mains voltage</td>
</tr>
</tbody>
</table>
### 5.3 Error code 3 OC

<table>
<thead>
<tr>
<th>Fault</th>
<th>OC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Overcurrent caused by</td>
</tr>
<tr>
<td>1. Faulty parameters</td>
<td></td>
</tr>
<tr>
<td>2. Short circuit, earth fault or isolation error</td>
<td></td>
</tr>
<tr>
<td>3. Device-internal default</td>
<td></td>
</tr>
<tr>
<td><strong>Possible solutions:</strong></td>
<td>1. Check parameters of control loops</td>
</tr>
<tr>
<td></td>
<td>2. Check installation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fault</th>
<th>OC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Overcurrent caused by</td>
</tr>
<tr>
<td>1. Faulty parameters</td>
<td></td>
</tr>
<tr>
<td>2. Short circuit, earth fault or isolation error</td>
<td></td>
</tr>
<tr>
<td>3. Device-internal default</td>
<td></td>
</tr>
<tr>
<td><strong>Possible solutions:</strong></td>
<td>1. Check parameters of control loops</td>
</tr>
<tr>
<td></td>
<td>2. Check installation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fault</th>
<th>OC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Overcurrent caused by</td>
</tr>
<tr>
<td>1. Faulty parameters</td>
<td></td>
</tr>
<tr>
<td>2. Short circuit, earth fault or isolation error</td>
<td></td>
</tr>
<tr>
<td>3. Device-internal default</td>
<td></td>
</tr>
<tr>
<td><strong>Possible solutions:</strong></td>
<td>1. Check parameters of control loops</td>
</tr>
<tr>
<td></td>
<td>2. Check installation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fault</th>
<th>OC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Overcurrent caused by</td>
</tr>
<tr>
<td>1. Faulty parameters</td>
<td></td>
</tr>
<tr>
<td>2. Short circuit, earth fault or isolation error</td>
<td></td>
</tr>
<tr>
<td>3. Device-internal default</td>
<td></td>
</tr>
<tr>
<td><strong>Possible solutions:</strong></td>
<td>1. Check parameters of control loops</td>
</tr>
<tr>
<td></td>
<td>2. Check installation</td>
</tr>
</tbody>
</table>

### 5.4 Error code 4 OV

<table>
<thead>
<tr>
<th>Fault</th>
<th>OV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>Overvoltage caused by</td>
</tr>
<tr>
<td>1. Overloaded barking chopper (braked too long or too much)</td>
<td></td>
</tr>
<tr>
<td>2. Mains overvoltage</td>
<td></td>
</tr>
<tr>
<td><strong>Possible solutions:</strong></td>
<td>1. Slower parameter setting of deceleration ramp, ext. Use braking resistor or chopper</td>
</tr>
<tr>
<td></td>
<td>2. Adapt mains voltage</td>
</tr>
</tbody>
</table>

### 5.5 Error code 5 OLM I^2xt switch-off motor

<table>
<thead>
<tr>
<th>Fault</th>
<th>OLM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>I^2xt switch-off to protect to protect motor (valid current/time area exceeded)</td>
</tr>
<tr>
<td><strong>Possible solution:</strong></td>
<td>1. Reduce load</td>
</tr>
<tr>
<td></td>
<td>2. Use more powerful motor</td>
</tr>
</tbody>
</table>
### 5.6 Error code 6 OLI I²xt switch-off final stage

<table>
<thead>
<tr>
<th>Fault</th>
<th>OLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>I²xt switch-off to protect final stage (valid current/time area exceeded)</td>
</tr>
<tr>
<td>Possible solution:</td>
<td>Reduce load</td>
</tr>
</tbody>
</table>

### 5.7 Error code 7 OTM Overtemperature motor

<table>
<thead>
<tr>
<th>Fault</th>
<th>OTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>Overtemperature motor (temperature sensor in the motor reacted) caused by</td>
</tr>
<tr>
<td></td>
<td>1. Temperature sensor not connected or faulty parameter settings</td>
</tr>
<tr>
<td></td>
<td>2. Motor overloaded</td>
</tr>
<tr>
<td>Possible solutions:</td>
<td>1. Let cool down motor</td>
</tr>
<tr>
<td></td>
<td>2. Connect or check setting of temperature sensor</td>
</tr>
<tr>
<td></td>
<td>3. Use more powerful motor</td>
</tr>
</tbody>
</table>

### 5.8 Error code 8 OTI Overtemperature final stage

<table>
<thead>
<tr>
<th>Fault</th>
<th>OTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>Overtemperature of final stage caused by</td>
</tr>
<tr>
<td></td>
<td>1. Surrounding temperature too high</td>
</tr>
<tr>
<td></td>
<td>2. Load too high (final stage or braking chopper)</td>
</tr>
<tr>
<td>Possible solutions:</td>
<td>1. Improve ventilation</td>
</tr>
<tr>
<td></td>
<td>2. Use more powerful unit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fault</th>
<th>OTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>Overtemperature in the interior of the unit caused by</td>
</tr>
<tr>
<td></td>
<td>1. Surrounding temperature too high</td>
</tr>
<tr>
<td></td>
<td>2. Load too high (final stage or braking chopper)</td>
</tr>
<tr>
<td>Possible consequences:</td>
<td>1. Improve ventilation</td>
</tr>
<tr>
<td></td>
<td>2. Use more powerful unit</td>
</tr>
</tbody>
</table>

### 5.9 Error code 9 PLS Plausibility control

<table>
<thead>
<tr>
<th>Fault</th>
<th>PLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction:</td>
<td>RESET</td>
</tr>
<tr>
<td>Cause</td>
<td>Plausibility control detected invalid program run</td>
</tr>
<tr>
<td>Possible solution:</td>
<td>1. Switch device off/on.</td>
</tr>
<tr>
<td></td>
<td>2. If this error should occur again, please contact your service partner.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fault</th>
<th>PLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction:</td>
<td>RESET</td>
</tr>
<tr>
<td>Cause</td>
<td>Invalid execution of control initialization</td>
</tr>
<tr>
<td>Possible solution:</td>
<td>1. Switch device off/on.</td>
</tr>
<tr>
<td></td>
<td>2. If this error should occur again, please contact your service partner.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fault</th>
<th>PLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reaction:</td>
<td>RESET</td>
</tr>
<tr>
<td>Cause</td>
<td>Unknown switching frequency during initialization of final stage protection</td>
</tr>
<tr>
<td>Possible solution:</td>
<td>If this error should occur again, please contact your service partner.</td>
</tr>
<tr>
<td>Fault</td>
<td>Reaction</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| PLS   | RESET    | Fault list could not be initialized during start-up. KP200 (top left) or parameter 423-ERPAR possibly display code of faulty parameter. | 1. DriveManager – active unit -> reset to factory default settings.  
2. Turn the unit off, keep keys Up and Down of KP200 pressed and turn the unit on again. KP200 displays "RESET" |
| PLS   | RESET    | Plausibility control detected invalid parameter object (wrong data type or data width) | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |
| PLS   | RESET    | No readable parameter or parameter access error via KP200 in current user level | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner |
| PLS   | RESET    | Both slots occupied by the same module | 1. Remove one module.  
2. Switch device off/on. |
| PLS   | RESET    | Error during auto-adjustment | 1. Check if motor type plate data correspond to corresponding motor parameters and start again auto-adjustment.  
2. If this error should occur again, please contact your service partner. |
| PLS   | RESET    | Pre-selection does not converge with parameter list | 1. Install suitable firmware  
2. Use different pre-selection  
3. If this error should occur again, please contact your service partner. |
| PLS   | RESET    | Invalid execution during macro processing | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |
| PLS   | RESET    | Internal parameter access error during controller initialization | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |
| PLS   |RESET     | |
## 5.10 Error code 11 FLT Floating points operations

<table>
<thead>
<tr>
<th>Code</th>
<th>Fault</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>FLT</td>
<td>General error during floating point operations</td>
<td>1. Switch device off/on.  2. If this error should occur again, please contact your service partner.</td>
</tr>
</tbody>
</table>

## 5.11 Error code 12 PWR Power unit

<table>
<thead>
<tr>
<th>Code</th>
<th>Fault</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>PWR</td>
<td>Power unit not correctly recognized</td>
<td>1. Switch device off/on.  2. If this error should occur again, please contact your service partner.</td>
</tr>
</tbody>
</table>

## 5.12 Error code 13 EXT Power unit

<table>
<thead>
<tr>
<th>Code</th>
<th>Fault</th>
<th>Cause</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EXT</td>
<td>Error message of external device</td>
<td>Troubleshoot error of external device</td>
</tr>
</tbody>
</table>

## 5.13 Error code 14 USR Software function

<table>
<thead>
<tr>
<th>Code</th>
<th>Fault</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>USR</td>
<td>Error during execution of a customer-specific software function</td>
<td>1. Check software version  2. If this error should occur again, please contact your service partner.</td>
</tr>
</tbody>
</table>
5.14 Error code 15 OP1 Option slot

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Fault Description</th>
<th>Cause</th>
<th>Possible Solutions</th>
</tr>
</thead>
</table>
| 150: OP1   | 15: Error code 15 | Module error on Option slot 1 | 1. Check module and identification  
2. If this error should occur again, please contact your service partner. |
| 151: OP1   | 151: Error code 15 | Error on Option 1: BUS-OFF status detected | Check contact of the module. If the error occurs again after switching off/on, the device or module is faulty. |
| 152: OP1   | 152: Error code 15 | Error on Option 1: Transmit protocol could not be established | Check contact of the module. If the error occurs again after switching off/on, the device or module is faulty. |
| 153: OP1   | 153: Error code 15 | Error on Option 1: Module does not answer anymore | Check contact of the module. If the error occurs again after switching off/on, the device or module is faulty. |
| 154: OP1   | 154: Error code 15 | Error on Option 1: Module reported error | Check contact of the module. If the error occurs again after switching off/on, the device or module is faulty. |

5.15 Error code 16 OP2 Option slot

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Fault Description</th>
<th>Cause</th>
<th>Possible Solutions</th>
</tr>
</thead>
</table>
| 170: OP2   | 170: Error code 16 | Module error on option slot 2 | 1. Check module and identification  
2. If this error should occur again, please contact your service partner. |
| 171: OP2   | 171: Error code 16 | Error on Option 2: BUS-OFF status detected. | Check contact of module. If the error occurs again after switching off/on, the device or module is faulty. |
| 172: OP2   | 172: Error code 16 | Error on Option 2: Transmit protocol could not be obtained. | Check contact of module. If the error occurs again after switching off/on, the device or module is faulty. |
| 173: OP2   | 173: Error code 16 | Error on Option 2: Module does not answer | Check contact of module. If the error occurs again after switching off/on, the device or module is faulty. |
| 174: OP2   | 174: Error code 16 | Error on Option 2: Module reports error | Check contact of module. If the error occurs again after switching off/on, the device or module is faulty. |
### 5.16 Error code 18 SIO Watchdog

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
</table>
| SIO     | Watchdog for communication control via LustBus triggered | 1. Check connection  
2. Check busmaster or increase parameter SWDGT  
3. Switch off control (factory parameter settings) with parameter SWDGT = 0 |

### 5.17 Error code 26 OL5 Ixt switch-off

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>OL5</td>
<td>Ixt switch-off below 5 Hz for end phase protection (valid current/time area exceeded)</td>
<td>Reduce load</td>
</tr>
</tbody>
</table>

### 5.18 Error code 30 ENC Encoder interface

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC</td>
<td>Error in encoder interface</td>
<td>Check encoder connection, cable type and parameter settings</td>
</tr>
</tbody>
</table>
| ENC     | Error in encoder interface: Wire break of track signals detected | 1. Check encoder contact (motor/device)  
2. Check encoder cable  
3. Check cable type and encoder parameter settings |
| ENC     | Error during hyperface interface initialization of encoder G6/G7: encoder reports communication error | Check wiring and parameter settings |
| ENC     | Error during hyperface interface initialilization of encoder G6/G7: Encoder type not supported by current software | 1. Check encoder  
2. Check software version |
| ENC     | Error during hyperface interface initialilization of encoder G6/G7: Encoder reports malfunction (detailed info: parameter 402-HSTAT)\ | Check encoder. |
| ENC     | Error during hyperface interface initialilization of encoder G6/G7: Communication parameters not found | Check wiring and parameter settings |
| ENC     | Error during hyperface interface initialilization of encoder G6/G7: Motor was moved during initialization | Observe motor standstill during encoder initialization. |
5.19 Error code 31 TIM Run time control

<table>
<thead>
<tr>
<th>Fault</th>
<th>Reaction</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
</table>
| TIM   | RESET    | Run time control (undefined routine) triggered. | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |

30: Fault TIM
Reaction: RESET
Cause: Run time control 5ms routine triggered
Possible solutions:
1. Switch device off/on.
2. If this error should occur again, please contact your service partner.

41 Fault TIM
Reaction: RESET
Cause: Watchdog for run time control (dSMC) triggered
Possible solutions:
1. Switch device off/on.
2. If this error should occur again, please contact your service partner.

5.20 Error code 32 FLW Lag error

<table>
<thead>
<tr>
<th>Fault</th>
<th>Cause</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLW</td>
<td>Lag error</td>
<td>1. Reduce load or acceleration 2. Increase authorized lag error</td>
</tr>
</tbody>
</table>

5.21 Error code 33 WDG Watchdog

<table>
<thead>
<tr>
<th>Fault</th>
<th>Ursache</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDG</td>
<td>Watchdog for RS232 (LustBus) caused</td>
<td>1. Check busmaster or increase 84-SWDGT</td>
</tr>
</tbody>
</table>

5.22 Error code 33 VEC Initialization of dSMC data RAM

<table>
<thead>
<tr>
<th>Fault</th>
<th>Reaction</th>
<th>Cause</th>
<th>Possible solution</th>
</tr>
</thead>
</table>
| VEC   | RESET    | Error during initialization of dSMC data RAM | 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner. |

43: Fault VEC
Reaction: RESET
Cause: Error during initialization of dSMC program RAM
Possible solution: 1. Switch device off/on.  
2. If this error should occur again, please contact your service partner.
### 5.23 Error code 36 POS Positioning error

<table>
<thead>
<tr>
<th>Code</th>
<th>Fault</th>
<th>Cause</th>
<th>Description</th>
<th>Possible solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Fault</td>
<td>Pos</td>
<td>Error in the positioning and sequence control. Please contact your service partner.</td>
<td></td>
</tr>
<tr>
<td>210</td>
<td>Fault</td>
<td>Pos</td>
<td>Traveled to positive hardware limit switch during positioning</td>
<td></td>
</tr>
<tr>
<td>211</td>
<td>Fault</td>
<td>Pos</td>
<td>Traveled to positive hardware limit switch during positioning</td>
<td></td>
</tr>
<tr>
<td>212</td>
<td>Fault</td>
<td>Pos</td>
<td>Traveled to positive software limit switch during positioning</td>
<td></td>
</tr>
<tr>
<td>213</td>
<td>Fault</td>
<td>Pos</td>
<td>Traveled to negative software limit switch during positioning</td>
<td></td>
</tr>
</tbody>
</table>
| 214  | Fault | Pos   | Reference point not defined or not found | 1. Check connection and position of reference cam  
     |       |       | 2. Check parameter setting of reference travel |
| 215  | Fault | Pos   | Error during access to optional hardware | Check connection and parameter setting of optional hardware |
| 216  | Fault | Pos   | Error in the positioning and sequence control: Selected sub-program non existing | Check program selection parameter setting |
| 217  | Fault | Pos   | Error in the positioning and sequence control: Jump to non existing set number | Syntax check of the program in the travel program editor |
| 218  | Fault | Pos   | Error in the positioning and sequence control: Called up sub-program non existing | Syntax check of the program in the travel program editor |
| 219  | Fault | Pos   | Target position outside the travel area | 1. Check travel area  
     |       |       | 2. Check setting of limit switches |
| 220  | Fault | Pos   | Error in the positioning and sequence control: Division by zero | |
| 221  | Fault | Pos   | Error in the positioning and sequence control: Maximum nesting depth (10) exceeded | Syntax check of the program in the travel program editor |
| 223  | Fault | Pos   | Target position not reached | 1. Check travel area  
     |       |       | 2. Check load  
<pre><code> |       |       | 3. Check position window (axis in position) |
</code></pre>
<p>| 224  | Fault | Pos   | No feed release | |</p>
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Fault Description</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>225</td>
<td>Fault Pos</td>
<td>1. Set feed release (if parametered)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Release control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible solution: Invalid selection (automatic/reference travel/touch-screen operation), conflict of control location</td>
</tr>
<tr>
<td>226</td>
<td>Fault Pos</td>
<td>Possible solution: Syntax check of the program in the travel program editor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible solution: Error in the positioning and sequence control: Index overrun (indexed addressing)</td>
</tr>
<tr>
<td>232</td>
<td>Fault Pos</td>
<td>Possible solution: Check parameter validity (number, value, access condition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible solution: Error in the positioning and sequence control: Error during reading of a parameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Reading failed or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Parameter not readable</td>
</tr>
<tr>
<td>233</td>
<td>Fault Pos</td>
<td>Possible solution: Check parameter validity (number, value, access condition)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible solution: Error in the positioning and sequence control: Error during writing of a parameter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Writing failed or</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Parameter not writable</td>
</tr>
<tr>
<td>234</td>
<td>Fault Pos</td>
<td>Possible solution: Error during execution of touch test travel command</td>
</tr>
<tr>
<td>235</td>
<td>Fault Pos</td>
<td>Possible solution: Wait for axis stop or deactivate setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible solution: Error in positioning and sequence control: Invalid command during axis movement (for example SAVE)</td>
</tr>
<tr>
<td>236</td>
<td>Fault Pos</td>
<td>Possible solution: Correct wiring of limit switches or configure CDD3000 inputs according to wiring diagram</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Possible solution: Limit switch interchanged</td>
</tr>
</tbody>
</table>

### 5.24 Error code 37 FLH Error in data flash memory

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>Reaction</th>
<th>Fault Description</th>
<th>Possible Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>50:</td>
<td>FLH</td>
<td>RESET</td>
<td>1. Switch device off/on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. If this error should occur again, please contact your service partner.</td>
</tr>
<tr>
<td>51:</td>
<td>FLH</td>
<td>RESET</td>
<td>1. Switch device off/on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. If this error should occur again, please contact your service partner.</td>
</tr>
<tr>
<td>57:</td>
<td>FLH</td>
<td>RESET</td>
<td>1. Reset device to factory default settings</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Switch device off/on.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. If this error should occur again, please contact your service partner.</td>
</tr>
</tbody>
</table>
6 Version history

<table>
<thead>
<tr>
<th>Author</th>
<th>Modifications</th>
<th>Version</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>FO</td>
<td>Adaptations for plant XYZ</td>
<td>0.1</td>
<td>20.10.04</td>
</tr>
</tbody>
</table>