Eurodoors GmbH

Original operating manual
Version 3.8   08/2017

Frequency converter FS-FU-1.1kW
control unit COMBO C1

status 08.2017

version 3.8

Eurodoors GmbH

Contents

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1   General

1.1   Introduction to operating manual

Please pay attention to the safety notes!

This manual is an integral part of the system and an essential aid for a successful and safe operation and use of the converter system.

Before operating the door system, a test run with examination of all safety devices, should be performed.

The converter and the control unit are built according to the state of technology and the approved safety rules.

The operator is obliged to adapt the mounting situation with the valid and current safety regulations.

1.2   Maintenance- and service regulations

1.2.1   Proper handling with cleaning agents and lubricants.

It is important to ensure that no cleaning fluids and lubricants are applied to the electronic wire. This counts especially for the use of spray oils and silicone-containing sprays, which are used in the context of door maintenance.

1.2.2   Requirements for maintenance, servicing, cleaning and care of the drive system.

⚠ Attention! Please turn off the power before this work step.

During maintenance, each wire has to be checked for moisture (oil) and contamination, because excessive contamination can damage the insulation permanently. If contaminants are found, they should be removed with a dry cloth. If this is not possible, you should use a mild solvent-free detergent.

The housing of the frequency converter and the screw on the cable terminals should also be examined for damage and their strength. If a screw is loose, it has to be secured.

Any damage to housings and leads are directly professionally put in stand. In case of damage to the electrical system it has to be carried out by appropriately trained personnel. The ZVEI regulations must be observed.

2 Safety Instructions

2.1 General

Although the inverter and the control were built according to the latest state of technology, there can be generated risks from the unit, if the system

- Ø is operated by untrained or not instructed personnel
- Ø is not used according to the intended use
- Ø is improperly maintained or serviced
- Ø is operated without PE connection. The system, the EMC filters and the safety precautions are based on wiring with a ground connection PE
- Ø is not mounted directly on the motor. The basis for compliance of the EMC guidelines is the mounting onto the engine. Cable <0.5 m

2.2 Intended Use

The modular system consisting of FS-FU-VOR (pre-filter), FS-FU-1.1KW (frequency converter) and Combo C1 is designed for use solely in industrial door with drive power of max. 1.1 kW or a door surface of less than 28 m² determined in accordance with the EN13241. Any other use is considered improper. The operator is liable for any resulting damage.

The system is primarily used to control the drive motor but is using suitable components suitable for the following functions.

- • Movement of a gate on and between its end positions (Up-, Down -and intermediate positions)
- • Frequency converter controls the motor with different speeds
- • Power detection with move-in security.
- • Analysis of safety sensors at the door
- • Connection and analysis of light grids and light barriers
- • Operation with radio or pull-rope switch
- • Connection option for external buttons
- • Connection option for potential-free relays
- • Event memory

Intended use also includes compliance with the instructions in this manual on

- Ø security
- Ø for operation
- Ø repair and maintenance

2.3   Symbols

Safety signs are determined by their geometric shape, the safety color
and the graphical symbol.

	◯	△	▢
Safety colour 🟥	Prohibited e.g. P001 No smonking		Fire protection e.g. F005 Fire extinguisher
Safety colour 🟨		Warning e.g. W001 Warning for flammable materials	
Safety colour 🟩			Rescue e.g. E003 First aid
Safety colour 🟦	Demanded e.g. M001 Eye protecion		

Warning of dangerous electrical voltage

Warning of crushing hazard

Attention important note

Safety signs must be used for identification in the workplace when it comes to
permanent prohibitions, warnings, commands and other data relevant to safety. The
ailing safety signs must be followed to ensure safe operation of the construction and
to ensure the safety of staff.

2.4   Safety instructions

Before opening the device, in any case, the power plug must be pulled,
in order to avoid the risk of electric shock.

The system has voltage, even after pulling the plug. For safety reasons,
a discharge time should be taken into account at least 3 minutes.

2.5   Electrical installation spaces

Access is permitted only for trained and qualified electrical staff. The electrical installation spaces are characterized by an e-arrow.

2.6   Planning electrical connection

In the selection of fault protection equipment and the cabling shall be considered the version EN 50178 (VDE 0160) "Equipping power installations with electronic equipment" April 1998, Section 5.2.11.2 and Section 5.3.2.3 .

This standard must to be used by the plant manufacturer in the configuration as a basis.

It is required that current-using equipment can produce smooth DC fault currents in the event of an error (for example frequency converter) to assign a dedicated circuit with AC-DC sensitive RCCB are. This protection must be of type B and be as firmly as possible inverter. That means the protective device should also take into account high-frequency interference.

Not allowed is the diversion of such circuits according to Pulse-current sensitive residual current protective devices, as these would be adversely affected in their function.

The socket for the system must to be installed next to the drive.

CEE-socket 230 V (blue)

The electrical connection is described in a separate chapter.

2.7   Safety devices

The operation of the system can be protected by various safety devices.

- Force sensing
- OSE
- Safety barrier
- Safety light grid

When you install this security devices always observe the manufacturer's installation instructions.

3   Health and safety measures

The drive system has been built according to the EG Machinery Directive and the following occupational safety and accident prevention regulations.

During repair work, the power supply must be turned off to prevent accidents.

If there is a safety-relevant fault has occurred, the system must be deactivated immediately. Only after repair the fault the drive can be re-activated.

3.1   Safety instructions for the operating staff

Ø   Keep order in your workspace
     Due to disorder, the risk of accidents increases

Ø   Note the warning and display units of the system

Ø   While cleaning, the power must be switched off

Ø   Don't allow unauthorized persons any settings on the system

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4   Electrical connection

The system is delivered completely assembled, ready for connection. The electrical connection is via a 230 V CEE plug-in connector.

Achtung
Gerät und Klemmen führen Spannung bis 180 Sekunden nach Abschalten der Netzspannung.

High Voltage
Parts are live up to 180 Seconds after removing mains voltage.   Marking of electrical installation spaces.

The inverter and the control unit are mounted on the motor. Display and keyboard in a separate housing.

4.1   Components

FS-FU-VOR pre-filter board
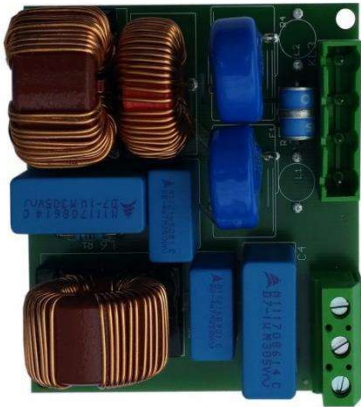
FS-FU-1.1kW frequency converter

⚠️ The pre-filter board and the frequency converter must always be used in combination, otherwise the requirements are not according to the EMC guidelines.

COMBO C1 control unit
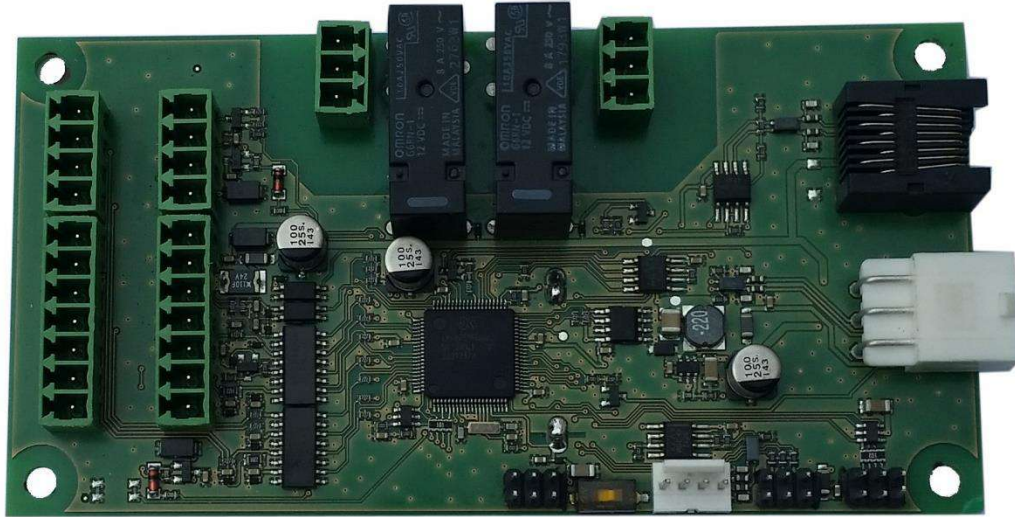
FS-FU-DISP display board
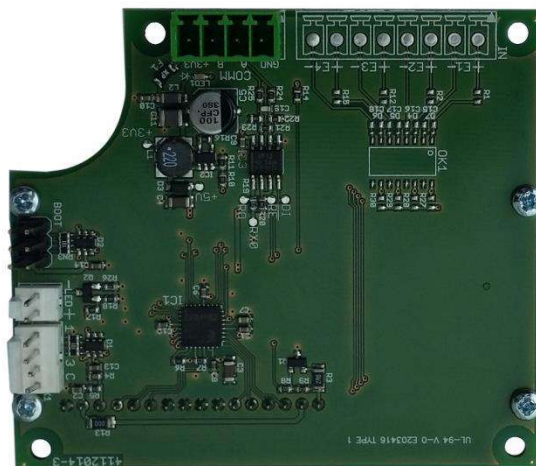
The control system is specifically designed for use with the frequency converter FS-FU-1.1kW.
The display board can be plugged during operation and used to configure. The board can also be permanently connected in combination with a triple switch combination and can be used to control the system.

4.2   Connection pre-filter and converter
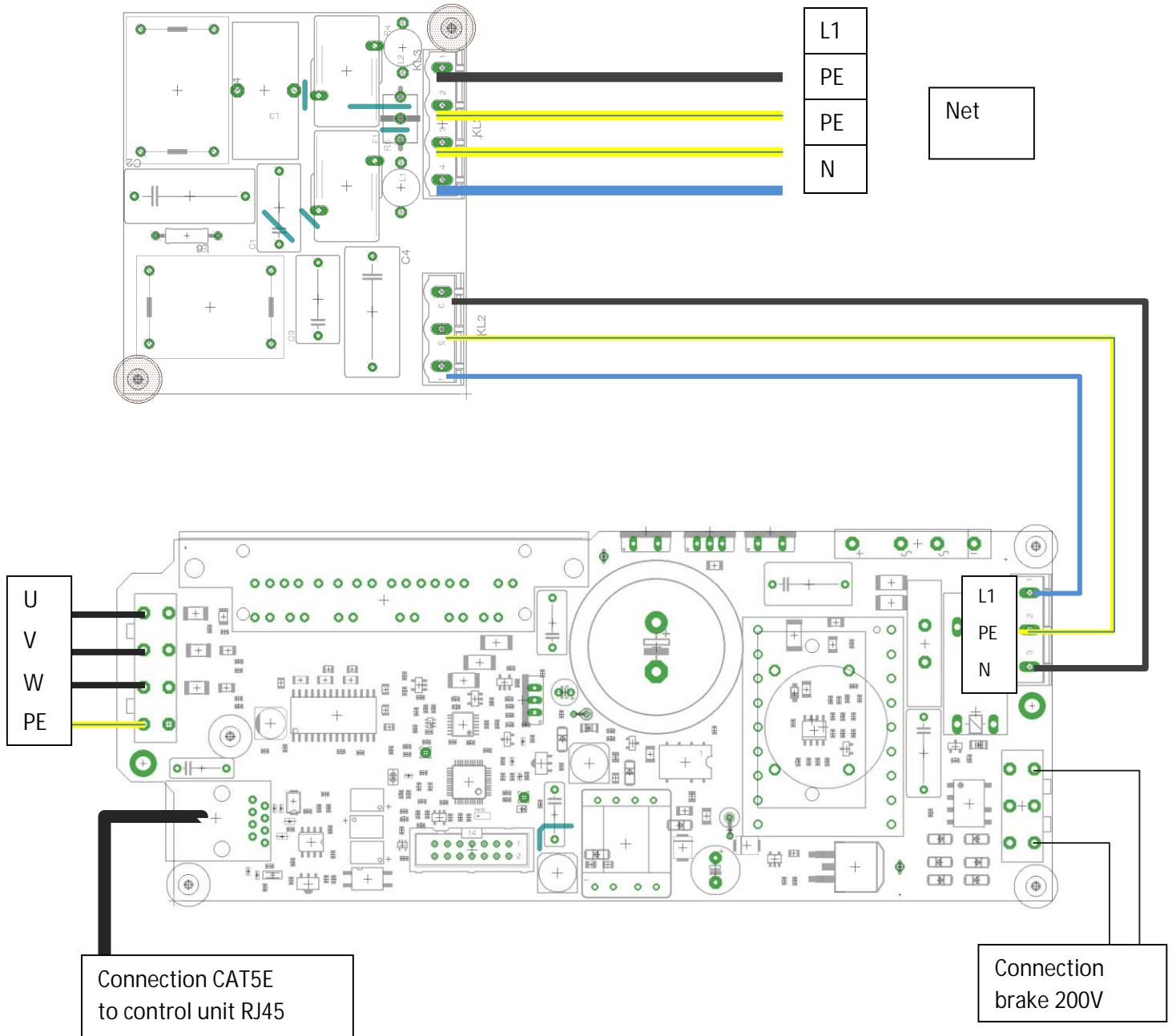
The power supply is mounted in the Y connection with tool on the plug. The supply line from the pre-filter to the main board via screw terminals with pressure plate which are also executed in the Y connection.

⚠ The devices have DC link capacitors, which is also when the mains supply lead off dangerously high voltage. Therefore, always wait after switching off the supply voltage at least 3 minutes before you open the device and start working. It is important to ensure that no live parts are touched.

Do not apply voltage to the output terminals U, V, W

4.3   Connections COMBO C1

AMP connector

Input safety chain —	1	4	— RS485 A
RS485 B —	2	5	— output safety chain
GND —	3	6	— V = 12 V

connection CAT5E
to the converter

connection rotary encoder

FS-FU-DISP
Vcc = 3,3V
RS485 B
RS485 A
GND

connections external 12V
relays max. 30 mA

Relay 2   ● = 12 V

Relay 1   ● = GND

On the clamp for relay 1
and 2 permanent with 12V
and the wire GND is active.

Note polarity !
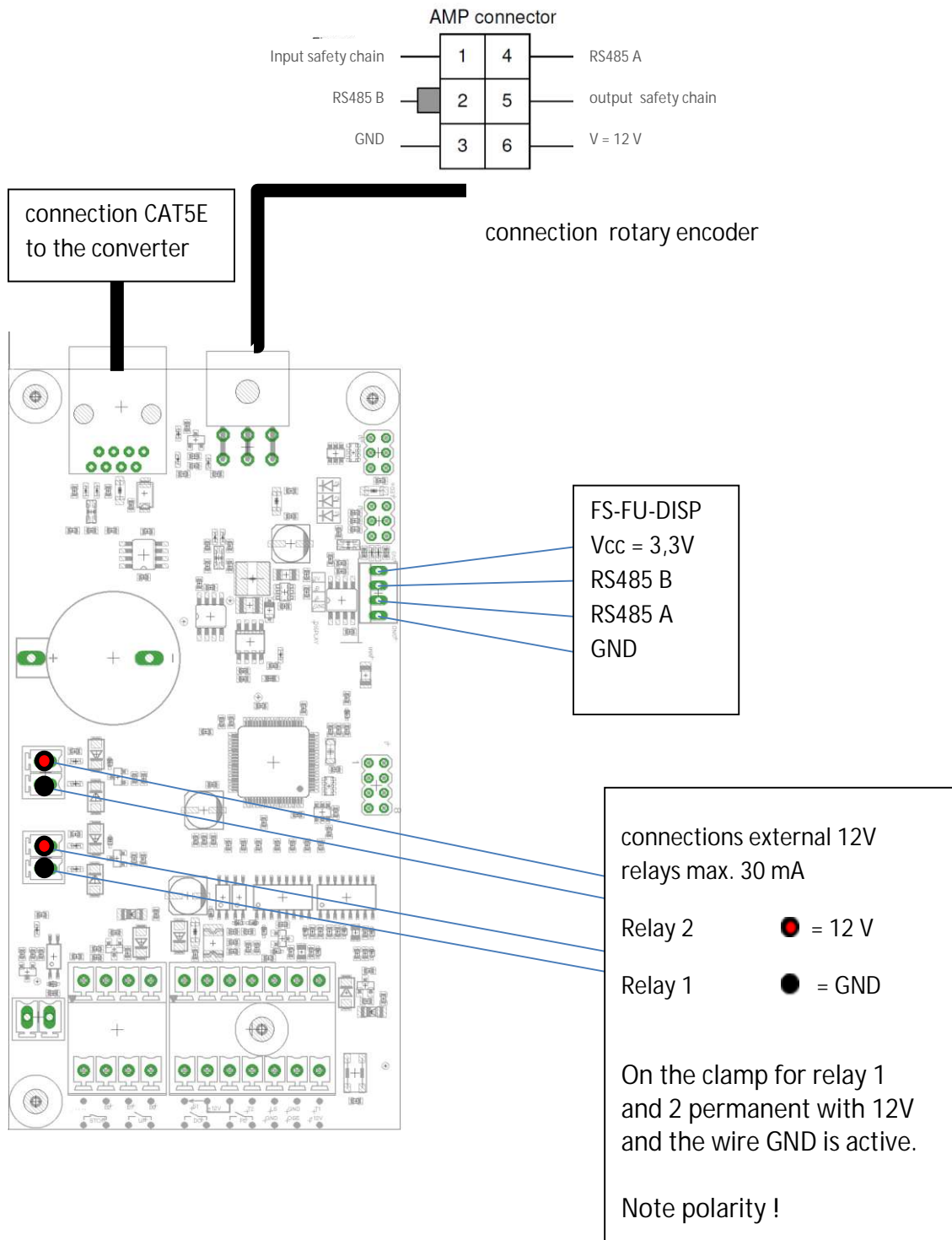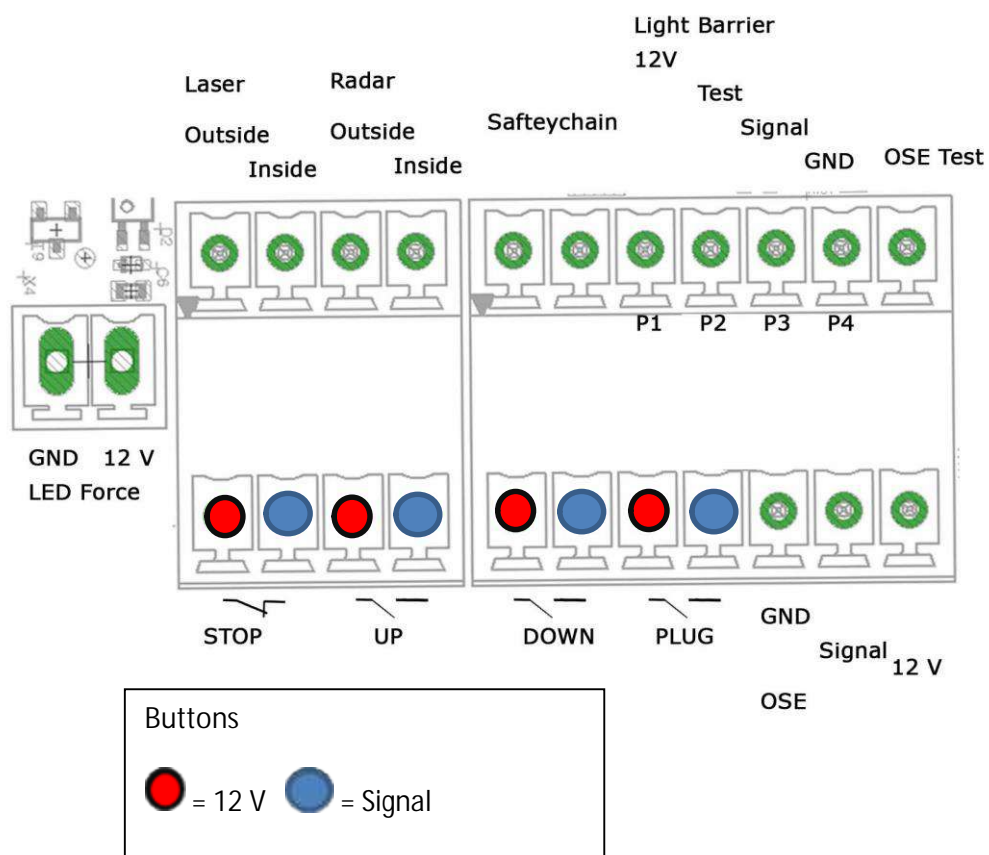
Pin assignment

assignment light barrier

Typ	Adjustment Test	P1 VCC +12V	P2 TEST	P3 SIGNAL	P4 GND
Witt transmitter receiver	Test Hi	brown brown	black -	- white	blue blue
Witt transmitter receiver	Test Lo	- brown	brown -	- white	blue+black blue
Pepperl + Fuchs transmitter receiver	Test Lo	- brown	brown -	- black	blue blue
Dalmatic transmitter receiver	Test Lo	black brown	brown -	- yellow	blue blue

Table 4.3.1

FS-FU-DISP
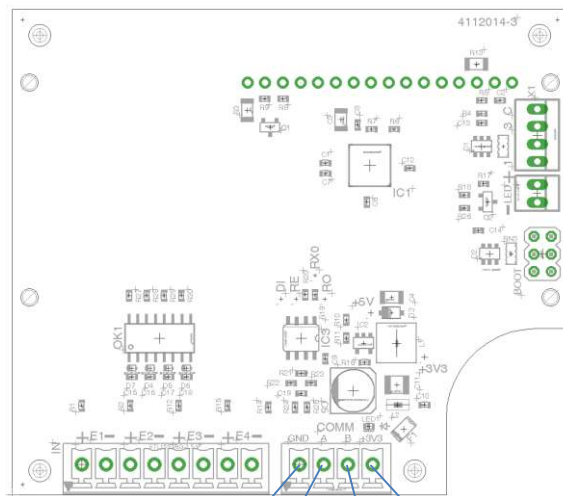
GND RS485 A RS485 B   Vcc 3,3V

Connection Combo C1

4.3.1 Wireless
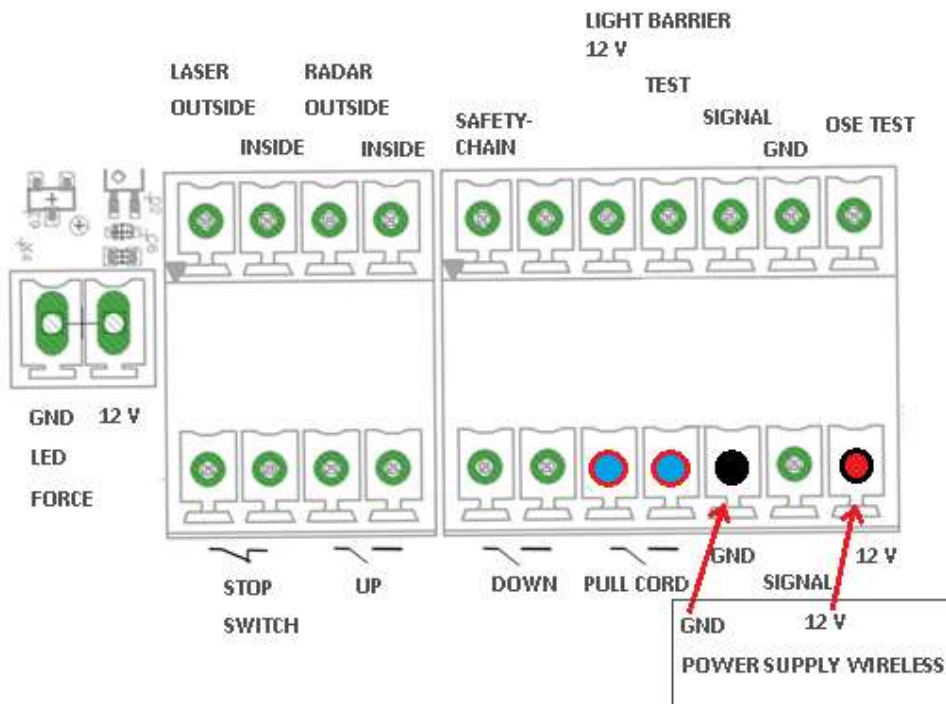
The switch contacts can be assigned to the desired function.
For operating with one channel the pull cord is for example colored.

For operating an oncoming traffic-light system, two relay boards are required.

Oncoming traffic-stoplight
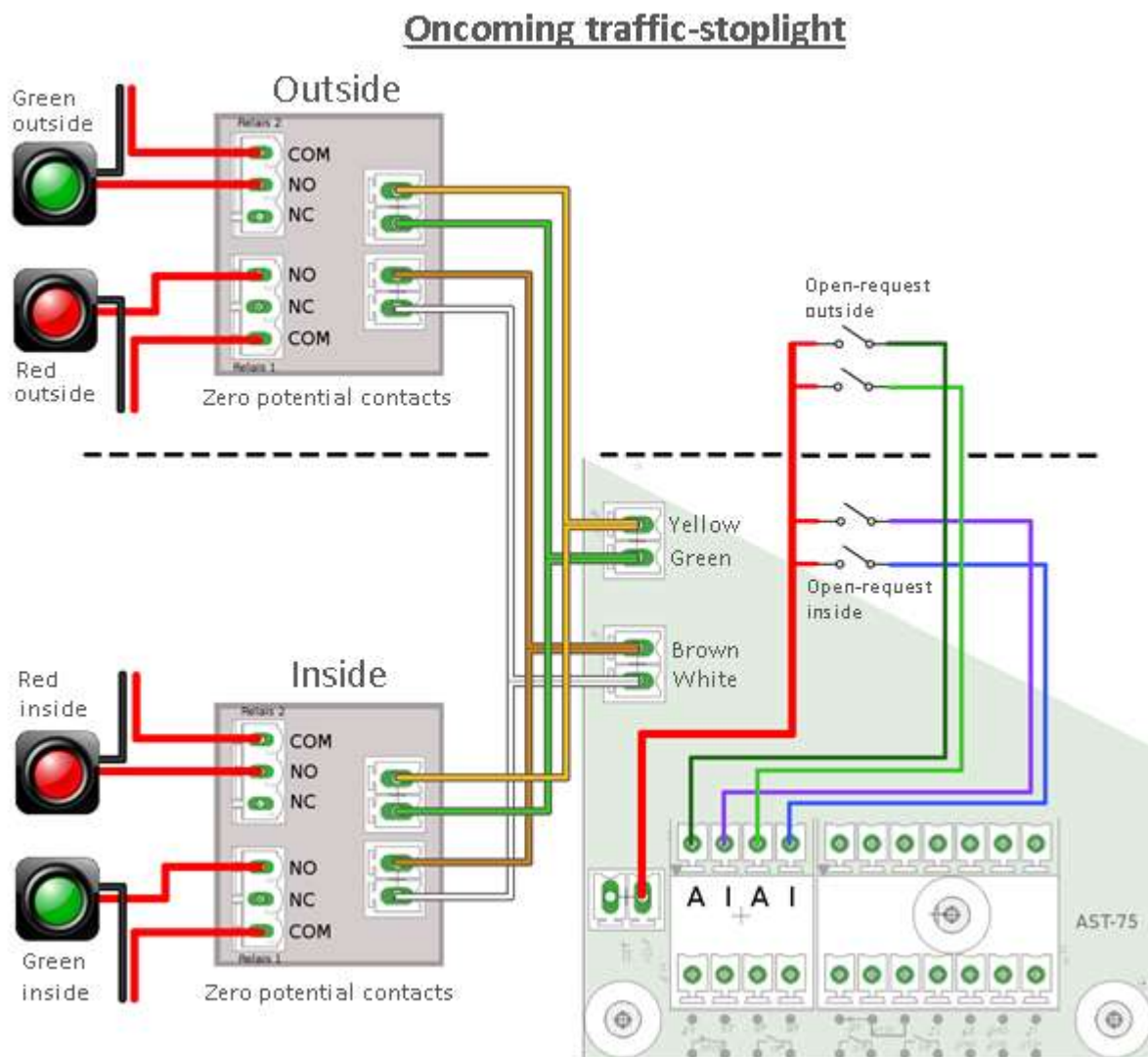
The potential free contacts are also designed for switching 230 V traffic lights.
Please gather the relevant information out of the data sheet for the additional board.

⚠️ Attention!

The function two-way traffic has to be activated as described in 7.6.7 Laser / Radar.
In addition in the section 7.6.8, Relay 1 and Relay 2 must be activated for two-way traffic and has to be configured with the appropriate lead times.

4.3.3. Lock - Function

Two controllers can be connected with help of a relay board to a lock function.

Here can be opened only one door, while the other door is blocking.

The lock function can be turned off manually at each control with using a rotary control switch.

1 - STOP
2 - NORMAL
3 - LOCK
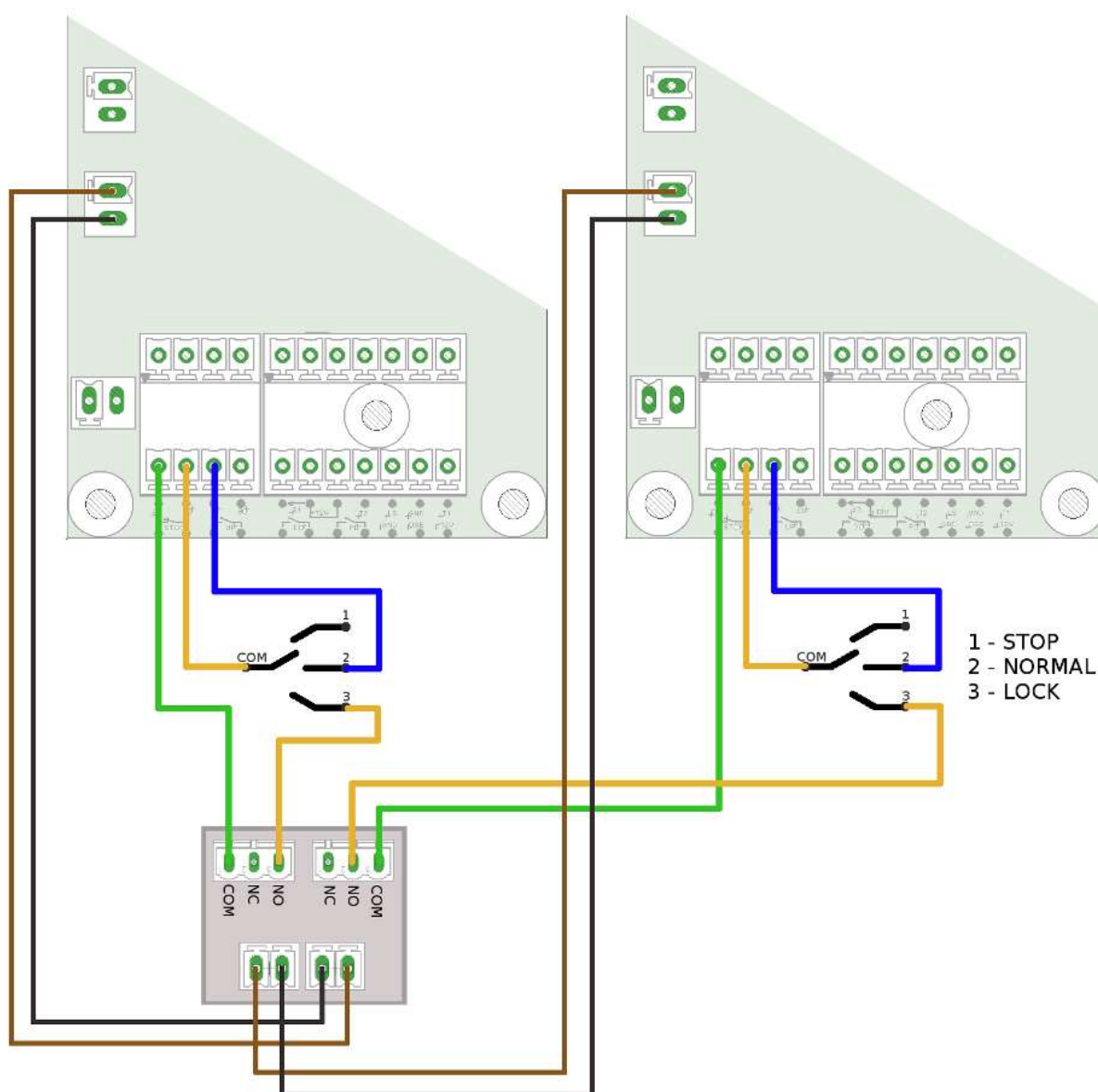
The lock function must be activated in RELAIS menu:

RELAIS 1   ↑↓ select with ◯ confirm

for RELAY 1 make the following settings:

END POSITION   ↑↓ select with ◯ confirm

DOWN?   ↑↓ select with ◯ confirm

MODUS TERM   ↑↓ select with ◯ confirm

Finally, save the settings with ◯ .

⚠ ATTENTION:

For works on the door, start up (adjustment final position) etc., should be deactivated the lock function on the rotary switch.

4.3.4. Connection of a fire alarm system (BMA)

The potential-free signal output of BMA can be connected to the appropriate input on the control unit Combo C1. The shift mode (NO / NC) can be freely selected in the menu.

When triggered the BMA, the door opens automatically in a predetermined position. („BMA-position").
The following applies:

· The door must be in automatic-mode. That means the necessary safety devices for automatic mode must be present and there must be no errors that prevent the automatic mode.

· First a currently ongoing door motion is completed. Only after that the door moves in the BMA position.

· The movement into the BMA position may be temporarily interrupted by keystrokes and triggering the safety devices. Lying no longer before this, the door automatically sets the drive on, after a break of 3-second, in the BMA position.

· If the BMA position is reached, the gate can no longer be moved from this position as long as the BMA signal is present. To move the door in this situation yet, the BMA must be disabled in the menu.
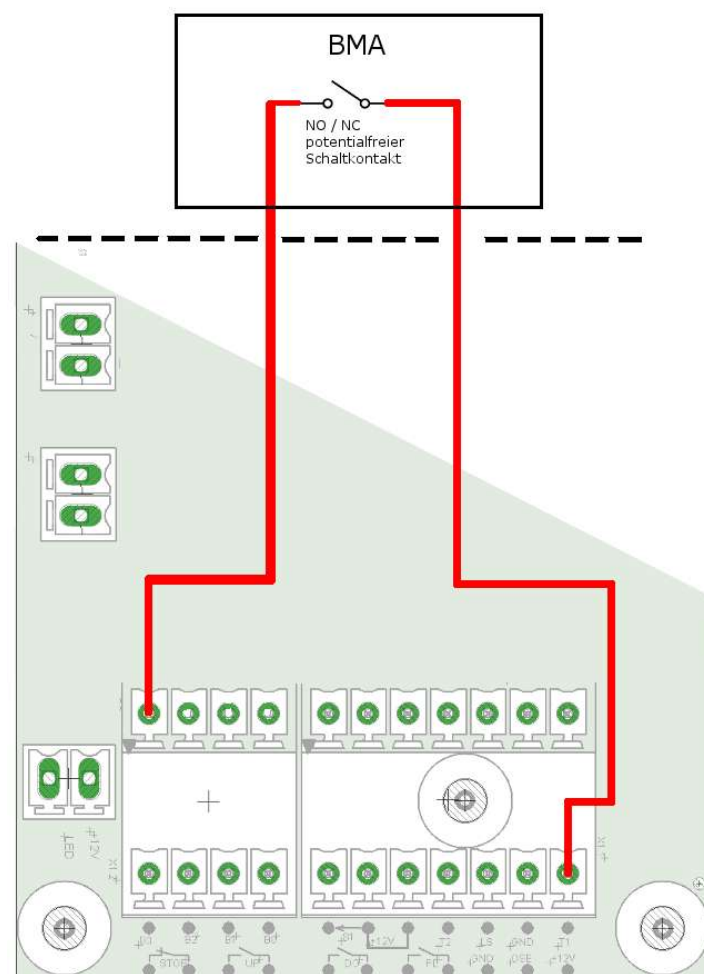
The BMA-function must be activated in MENU:

DOOR POSITIONS ◯

POSITION FIRE ALARM SYSTEM BMA ◯

POSITION BMA   ↑↓ drive the door to desired BMA position.
                    select with ◯ confirm

MODE BMA   ↑↓ select with ◯ confirm

NC (OPENER)   BMA-function triggered if contact open
NO (CLOSER)   BMA-function triggered if contact closed

5   Handling

5.1   Menu handling

The meaning of the buttons for navigation:

	The configuration menu is activated by simultaneously pressing the STOP and DOWN button. Press and hold the key combination until the indicator on the display is empty
	Selection scroll up: The display is shown on the right side by an arrow symbol can be navigated in which direction
○ symbol in the text	Activate menu point or confirm the selection: The STOP button is the same like the ENTER button
	Selection scroll down: The display is shown on the right side by an arrow symbol can be navigated in which direction

6   Start-Up basis data

The contents of the display are displayed in this SAMPLE DISPLAY.

The buttons are used with the following symbols in the text:

↑   UP

↓   DOWN

○   STOP

6.1 Language

The first menu point is the language LANGUAGE GERMAN   ◯

LANGUAGE GERMAN ↓ press to navigate and confirm the desired language with   ◯

STOP = SAVE   OTHER = CANCEL

6.2 Time

TIME DATE   ◯

The time is displayed in the format   2015-01-14 JJJJ-MM-DD. With the STOP button, the individual points can be controlled. The active segment of the number is flashing and can adjust with ↑ or ↓. Continue with ◯.

The time is set as the date.   Display format 08:02:09 hh:mm:ss.

The time is important, because the system has an event memory.

6.3 Profiles

The profiles provide a fast adjustment of control unit and converter. There is a table on the enclosed paper where you can choose the profile for your door. Please select the relevant profile in the start-up.

PROFILES   ◯

LOAD PROFILES with ↓ go to the factory settings

with ◯ to the profiles for the

       CONTROLLER   ↑ ↓ selection confirm with   ◯

       INVERTER   ↑ ↓ selection confirm with   ◯

       LEAVE SELECTION

RESET TO FACTORY SETTINGS ↑ ↓ perform with   ◯

⚠ ATTENTION all settings will reset.

6.4   Door Position (final position)

In the menu door positions, major basics will be set for the function of the force sensing. All steps in this submenu must be set to the position partial opening. Especially the position 2.50m is important, as the system changes from that downward position in to the medium speed.

CHECK DIRECTION OF ROTATION   ◯

The direction of rotation must be checked and confirmed once before initial startup, so that the direction of rotation of the encoder is confirmed.

MOVE DOOR UP/DOWN ↑ or ↓

The direction of rotation can be confirmed with ◯. If the direction of rotation is wrong, you can change this with one other button.

STOP = OK

OTHER = WRONG

If the door was not driven, this message is displayed

DOOR MOVEMENT NOT DETECTED

DOORPOSITION TOP   ◯

TOP   1256

↑ or ↓ with ◯ confirm position

Settings of the upper end position. Please note that also move the encoder values upwards.

DOOR POSITION BOTTOM   ◯

BOTTOM   376

↑ or ↓ with ◯ confirm position

Settings of the lower end position. Please note that also move the encoder values downwards.

POSITION 2,50 m   ◯

POSITION 2,50 m   1256

↑ or ↓ with◯ confirm position

Setting of the position 2,5 m. Drive the door to the closing edge until a height of 2.5m is reached and save with ◯ .

⚠️ This value is the start position of the middle drive in downward direction. If this value is not set, it can lead to increased strength values.

FORCE SENSING LEARNUNG CYCLE UP   ◯

During the learning cycle, make sure that no obstacles stand in the doorway.

The door must be in the BOTTOM position for this function. Please follow the instructions shown in the display until the force sensing light is flashing and

DOOR MOVE UP   is shown in the display.

Now the door has to be moved to the upper end position, with pressed (dead man) button ↑. At the end of the adjustment SAVED CHANGES appears in the display and the light stops flashing.

Now, with the button ↓ the next setting can be called.

FORCE SENSING LEARNUNG CYCLE DOWN   ◯

During the learning cycle, make sure that no obstacles stand in the doorway.

Please follow the instructions shown in the display until the indicator jumps to

DOOR MOVE DOWN and the force sensing light is flashing.

Now the door has to be moved to the bottom position, with pressed button ↓ (dead man). At the end of the adjustment CHANGE SAVED appears in the display and the light stops flashing.

Please note that this process must be repeated, whenever the end positions or the speed of the door system is changed.

POSITION PARTIAL OPEN ◯

PARTIAL OPEN   2896

Choose here the desired height for a partial opening and confirm this setting with ◯. After the confirmation

PARTIAL OPEN ACTIVE appears in the display

In operation, through simply pressing the ↑ button, the door can be partially opened. If the button ↑ is pressed 2 x, the door opens into the upper end position.

Should the partial opening be deactivated, please deactivate in the display

PARTIAL OPEN ACTIVE   with the ◯ and ◯ button deactivated.

POSITION FIRE_ALARM_SYSTEM BMA ◯

Here you can activate the BMA-function.

    See 4.3.4 connection fire-alarm-system (BMA)

Should the fire-alarm-system be deactivated, please deactivate in the display

FIRE-ARLAM BMA IS ACTIVE   with the ◯ and ◯ button deactivated.

LEAVE SELECTION

6.5   Maintenance Settings

SERVICE PHONE NUMBER   ◯

COMPANY NAME ◯ Name of the company that is responsible for the maintenance.

_ appears in the display

Now you can select with the ↑↓ buttons, a sign or a number. With the button ↓ the alphabet starts and with ↑ special signs and numbers.

The symbol › indicates that the entry now can be saved with ◯. The symbol ‹ and ◯ allows to delete of signs.

SERVICE NUMBER◯ phone number of the company that is responsible for the maintenance.

_ appears in the display

Now you can select with the ↑↓ buttons, a sign or a number. With the button ↓ the alphabet starts and with ↑ special signs and numbers.

The symbol ↑ indicates that the entry now can be saved with ◯. The symbol ‹ and ◯ allows to delete of signs.

MAINTENANCE COMPLETE ◯

CONFIRM MAINTRENANCE OK? Please wait until
STOP = SAVE   OTHER = CANCEL appears in display

MAINTENANCE INTERVAL ◯
MAINT. EVERY 25000 CYCLES ↑↓ change ◯ save
MAINT. EVERY 365 DAYS ↑↓ change ◯ save

INFORMATION ◯

Under this menu item, information about cycles, operating times and software versions, can be found.

VIEW CONFIGURATION ◯

Here the current settings can be found.

EVENT MEMORY ◯

The event memory records error messages, with a time stamp, that occur in the system. (see attachment messages)

6.6   Extended Settings

6.6.1   Password

⚠ Attention, an expert password has to be assigned with the startup procedure, otherwise the user can manipulated the security settings

EXTENDED SETTINGS ◯   **PASSWORD** ◯

The password for the menu can be set at this point. With the button ↑ or ↓ choose the relevant signs for each position. Save with ◯ .
The process ends by pressing the ◯ button and will be stored

LEAVE SELCETION ◯ .

The setting 0 0 0 0 will reset the current password

6.6.2   Frequency converter adjustment

INVERTER SETUP ◯   **INVERTER SETUP   to DIRECTION** ◯

⚠ If this data is changed and a light grid or the force sensing is used, the learning cycle must be performed for the system again.

MAX SPEED   80 Hz   ↑ or ↓   ◯

Maximum speed for the motor in UP direction. The speed for spring-less doors should be set to a max. of 88 Hz. With spring-balanced doors the set up can be up to 120 Hz.

MIN. SPEED   25 Hz   ↑ or ↓ ◯

START RAMP   512 ms   ↑ or ↓ ◯

Time in which the door accelerates from standstill to maximum speed.

BRAKE RAMP   512 ms   ↑ or ↓   ◯

Time window, in which the speed is delayed from maximum to minimum.

STOP RAMP   512 ms   ↑ or ↓   ◯

Stopping time duration of maximum speed to standstill. The setting is used for manual stop, but not with emergency stop, stop in final positions etc. which are controlled by the system.

POS. MIN. SPEED   250 Incr   ↑ or ↓   ◯

The position min. speed is the distance in increments before the upper end position, in which the system switches to the slow ride.

STOP = SAVE   OTHER = CANCEL

INVERTER SETUP   DOWN DIRECTION ◯

MAX SPEED   80 Hz   ↑ or ↓   ◯

Maximum speed for the motor in DOWN direction. The speed for spring-less doors should be set to a max. of 50 Hz. With spring-balanced doors the set up can be up to 80 Hz.

MEDIUM SPEED   30 Hz   ↑ or ↓   ◯

The data for the medium speed is effective if the height of 2.50 m is actively used. The system then moves in into medium speed after 2.50 m. This is required in the force sensing or OSE operation.

The medium speed must be set between the max. and the min. speed.

MIN. SPEED   25 Hz   ↑ or ↓   ○

START RAMP   512 ms   ↑ or ↓   ○

Time in which the door accelerates from standstill to maximum speed.

BRAKE RAMP   512 ms   ↑ or ↓   ○

Time window, in which the speed is delayed from maximum to minimum.

STOP RAMP   512 ms   ↑ or ↓   ○

Stopping time duration of maximum speed to standstill. The setting is used for manual stop, but not with emergency stop, stop in final positions etc. which are controlled by the system.

POS. MIN. SPEED   250 Incr   ↑ or ↓   ○

The stop ramp is the doorway in increments before the lower end position, in which the system switches to the slow speed.

When using self-locking gears, this data can be reduced to 1 increment, to deactivate the speed change or to move into the lower door area. This has a particular impact on the force sensing in the lower area (50 mm) of the door.

DOOR BALANCED ○ ↑

or   DOOR UNBALANCED confirm with ○

Here you can choose what type of door is used.

MOTOR PROFILE ○

TAE 0.55 kW   ↑ or ↓ ○

The right profile for the motor must be selected here so the system can work with the right motor data.

6.6.3 Force Sensing

LEARNING CYCLE UP   ○

LEARNING CYCLE DOWN   ○

(see chapter door position)

FORCE SENSING UP   ◯

These values can be changed without performing a new learning drive. The percentages indicate how much must be exceeded, the taught curve, so that the system triggered.

TRIGGER LEVEL   70 %   ↑ or ↓   ◯

The sensitivity in UP direction, care for a move-in safety. As much higher is the value, as much insensible is the system. If the response of the system is to be insensitive, this value must be reduced.

If the value is set to 0, the power detection is deactivated in this direction.

STOP = SAVE   OTHER = CANCEL

FORCE SENSING DOWN   ◯

These values can be changed without performing a new learning drive. The percentages indicate how much must be exceeded, the taught curve, so that the system triggered.

SENSIBILITY   30%   ↑ or ↓   ◯

The sensitivity in DOWN direction, care for a move-in safety. As much higher is the value, as much insensible is the system. If the response of the system is to be insensitive, this value must be reduced.

If the value is set to 0, the power detection is deactivated in this direction.

STOP = SAVE   OTHER = CANCEL

FORCE SENSING U P RESET   ◯

FORCE CURVE RESET

FORCE SENSING D O W N   ◯

FORCE CURVE RESET   ◯

By reset the power curve, can be -for example- ensured after repairs or service that the values current match to the corresponding door situation. The deletion of the power curve makes required a new learning drive.

INCR TRIGGER LV DURING ACCEL.   ⭕

INCR TRIGGER LVL   25 %

If in the acceleration phase or during deceleration of the door the power detection triggered, may be you can reduce the sensitivity.

INCR TRIGGER LV AT MAX SPEED   ⭕

INCR TRIGGER LVL   12 %

This value reduces the sensitivity in the downward movement at maximum speed. From the height set for 2.5 m, apply the normal sensitivity again.

STOP = SAVE   OTHER = CANCEL

LEAVING SELECTION

⚠️ In the use of power detection, after the initial start and after each service a power measurement at the closing edge must be performed, with the relevant provisions. Cannot be met the values, the door must be closed or otherwise secured.

6.6.4 safety installations (switch rail)

In this menu point can be activated the connected safety devices such as switch rails, light barriers and light grids.

Two terminals are for safety devices disposal.

First, you must select the clamp (↓ or ↑) which is connected the safety device. If the clamp is displayed, is on the second line of the status of the unit.

STOPP button ◯ confirm to edit the settings:

DEVICE   ↓ or ↑ or   ◯ save

Select type of connected safety device, or select NOT ACTIVE to disable the clamp.

TESTING   ↓ or ↑ or   ◯ save

Select art of testing. For TESTING SIGNAL HI/LO note wiring in table 5.3.1:

UNTESTED	no active testing
SELF TESTING	permanent self testing, for example OSE
TEST SIGNAL HI	active test starts with 12V level on TEST-PIN
TEST SIGNAL LO	active test starts with 0V level on TEST-PIN

ACTIVE DIRECTION   ↓ or ↑ or   ◯   save

Select direction in which the safety device should be active:

UP	active during the opening movement of the door
DOWN	active during the closing movement of the door
UP AND DOWN	active in both directions. This selection only for light barrier and light grid

WITH CONFIRM   ↓ or ↑ or   ◯   save

Specify the type of safety device:

COMPLETE REVERSION	door reverses direction and moves to the opposite end position
PART REVERSION	door reverses direction and moves a short way.
STOPP	door stops

FADE OUT   ↓ or ↑ or ○ save

Only for light barrier and light grid.
Allows the inactive switch ("fade out") of the safety device in the lower door area.

NO ACTIVE   not fade out

ACTIVE   active fade out-function. Drive the door in the next menu
                     the door to the point, from which the safety device down-
                     stream have to fade out and confirm this selection with ○

6.6.5 Operation Mode

DEADMAN   UP / DOWN   ↓ or   ○

IMPULSE   UP / DOWN   ↓ or ↑   ○

You are only able to choose that option if you have installed a photo relay or an other
security device.

IMPULSE UP   DEADMAN DOWN   ↑ or   ○

LEAVING SELECTION

6.6.6 Laser / Radar

LASER / RADAR   STATUS   ○

In this menu the Laser / Radar can be enabled and the type can be selected.

NOT ACTIV   ↓or   ○ to save
FIXED   ↓ or ↑   ○ to save
Laser fixed to the frame

MOBIL   ↑ ○ to save

Laser fixed to the door leaf

RADAR   POSITION 2566

At this point, the door position is set which will run-up when the system is triggered
by radar.

ONCOMING TRAFFIC   ↑   ○ to save

With this option, the function oncoming traffic is activated. Please note that the appropriate settings for relay 1 and relay 2 must be made.

STOP = SAVE   OTHER = CANCEL

LEAVING SELECTION

6.6.7 Relay control

The relay control allows the operation of two external 12 V 30 mA relay. These can be used for the circuit of 230V traffic lights or similar things. Please do not connect appliance directly to these contacts, since the safety edge is limited.

RELAY 1 NOT ACTIVE ◯

Activate for

RELAY 1 MOVEMENT   ↓ or ◯ to save

Relay is active during the drive. In the sub menu, the type of shifting procedure and the direction of drive can be selected.

DIRECTION UP   ↓ or ◯ to save

PRERUN UP 0s

    DIRECTION DOWN   ↓ or ◯ to save

      PRERUN DOWN 0s

    DIRECTIONs UP AND DOWN   ↓ or ◯ to save

      PRERUN UP 0s

      PRERUN DOWN 0s

MODE

    TIME   ↓ or ◯ to save

    BLINKING   ↓ or ◯ to save

RELAY 1 END POSITION   ↓ or ↑ ◯ to save

    END POSITION UP   ↓ or ↑ ◯ to save

    END POSITION DOWN   ↓ or ↑ ◯ to save

    END POSITION BOTH   ↓ or ↑ ◯ to save

MODE

    BLINKING   ↓ or ◯ to save

IMPULS   ↓ or ◯   to save

ONCOMING TRAFFIC   ↑ ◯   to save

PRERUN UP 0s   ↓ or↑ ◯   to save

PRERUN DOWN 0s   ↓ or↑ ◯   to save

With this option the two-way traffic will be activated and the Prerun time for the up- and downward motion can be adjusted.

RELAY 2 NOT ACTIV   ◯

Look at Setup RELAY 1.

6.7   Extended Settings / Automatically closing

AUTOMATIC CLOSE   ◯

This option can only be activated, if there is a light barrier or a light grid is installed.

STOP = ACTIVE   OTHER = INACTIVE

When active, you will see the following sub-items.

AUTO CLOSE   60 s   ↓ or ↑ ◯ to save

Here the time is set, after which the door closes automatically.

MAX. EMERG. REV 3   ↓ or ↑ ◯ to save

Under this menu point you can set the number of reversals, from which the automatic mode is interrupted.

STOP = SAVE   OTHER = CANCEL

AUTO CLOSE   AFTER CROSSING   ◯

STOP = ACTIVE

OTHER = INACTIVE

If active you will see the following sub items.

AFTER CROSSING 3s   ↓ or ↑   ◯ to save

Here the time is set, after which the door closes automatically.

STOP = SAVE   OTHER = CANCEL

SAFETY LIMIT SWITCH ◯

OFFSET 100 INK   ↓ or ↑ ◯ to save

STOP = SAVE   OTHER = CANCEL

This option is a system setting. Please do not change.

PRE-LIMIT SWITCH ◯

Position at which the system changes with activation of the safety device in the DOWN direction by reversing to stop. (space 50mm before the bottom final position)

OFFSET 24 INK ↓ or ↑ ◯   to save

STOP = SAVE   OTHER = CANCEL

BRAKING-POINT   ◯

OFFSET 15 INC   ↓ or ↑◯   to save

This option sets the point where the automatic calibration for the bottom position starts.

EXT STOP LOGIC

Here can be selected, the switching logic of the external STOP button. The choices are: "Normally Closed" (NC) and "Normally Open" (NO).

NC (OPENER)	STOP is active, if the switch is open. No connection between the two inputs of the stop-clamp.
NO (CLOSER)	STOP, is active, if the switch is switched off

DOOR TYPE

Indicates the type of door is used. This information is used mainly for a better adjustment of force sensing to the door.

SECTIONAL DOOR

7   System Messages

display text English	legend	causes
F00	Error with no assigned message. Please read the text in the display.	
F01 LIMIT SWITCH	door movement across the bottom position	1) Value POS. SLOW SPEED (Inverter Settings) to low 2) Value SAFTEY LIMIT SWITCH (Extended settings to low) 3) Door positions not correct set 4) DIRECTION OF ROTATION not ok. 5) Brake damaged / door crashed
F02 LIMIT SWITCH	door movement across the top position	1) Value POS. SLOW SPEED (Inverter Settings) to low 2) Value SAFTEY LIMIT SWITCH (Extended settings) to low 3) Door positions not correct set 4) DIRECTION OF ROTATION not ok.
F03 DIRECTION	door movement in wrong direction	1) DIRECTION OF ROTATION not ok. 2) 'sag' during start of a massy door panel
F04 DOOR SPEED	door was blocked during the movement	1) Door stopped through a barrier 2) Encoder damaged 3) Inverter stops the system (internal error like motor thermo switch) 4) Inverter stops the system because voltage to high (braking chopper not connected)
F05 UNAUTH. MOVE	unauthorized movement	1) Brake damaged or not switched 2) Stop command not send 3) Encoder detects ghost movement
F06 DOOR SPEED	door speed was to high (speed control)	1) Door much faster than in the last movement in the same direction. (more weight or something like this) Reset speed control by setting one of the door positions. .
F07 DOOR SPEED	door doesn´t move after trigger	1) Inverter no ready to start because of internal errors 2) Inverter not able to run motor (wrong motor settings or weight to high) 3) Encoder not fixed (uncontrolled moves) .

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display text English	legend	causes	
F08 CONFIGURATION	Configuration not found. System was set to factory defaults.	1) No valid configuration in EEPROM found Communication with EEPROM is ok. Normal when unit is new or set to factory default. 2) The deposited configuration is too old and not competitive with new software. Can appear after update to new version.	
F09 POWER UP	System was rebooted		
F10 FORCEPL.MISS	values force curve UP missing	1) Force Sensing in up direction enabled but there are no values stored in the system. Please teach the force sensing.	
F11 FORCEPL.MISS	Values force curve DOWN missing	1) Force Sensing in down direction enabled but there are no values stored in the system. Please teach the force sensing.	
F14 FINAL POS	Final positions not deposited	1) Please, setting the limit positions in the "door position" menu.	
F18 EEPROM/12C	Error accessing from the EEPROM component. Leads to system reboot.	1) Hardware error in I²C Bus, or in EEPROM	
F23 INV THERMO	Inverter sending message high temperature. Is displayed, until inverter cooled.	Temperature at the inverter module exceeds a maximum value of 90°C. Inverter is ready for operation again when temperature below 60°C.	
F24 INVERTER	error with cycle test of safety chain – function	When the door is standstill, a test carried out regularly (all 10 sec.) by the safety chain, here the safety chain switched, then is then scanned via a command in the inverter. 1) Communication error 2) Error in system of the safety chain	
F25 INV HARDWARE	Inverter send hardware error	Inverter has detected problems in analysis of motor currents and voltages. 1) One or more motor phase not connected 2) The motor phase not correct connected together 3) Hardware error in the measuring jumper, inverter side 4) Excess voltage on the board (voltage in the intermediate circuit to high)	
F72 OSE	OSE error	1) OSE triggered permanently or blockade light channel	
F74 OSE	wireless OSE error	1) OSE triggered permanently 2) test can't be performed Cause depends from used OSE: f. E. cable damaged, blockade light channel, battery OSE	

display text English	legend	causes
F81 LIGHT BARRIER	Light barrier error	Light barrier triggered permanently or test can't be performed: 1) Object in door area? 2) Cable damaged? 3) Light barrier correct justified? 4) Light barrier operational
F84 LIGHT GRID	Light grid error	Light grid triggered permanently or test can't be performed: 1) Object in door area? 2) Cable damaged? 3) Light grid correct justified? 4) Light grid operational
F90 POSITIONER	Error Uart-Initialization: line busy	1) Wiring ok?
F91 ENCODER	Error encoder: position outside valid area	1) Wrong encoder? 2) Communication error
F92 ENCODER	Timeout receiving data from encoder. Message not complete	1) Wrong encoder? 2) Communication error
F93 ENCODER	Timeout receiving data from positioner. No signs received.	1) Wrong encoder? 2) Communication error 3) Cable damaged / not connected
F94 INVERTER	Timeout receiving data from inverter	1) Cable damaged? 2) Inverter not ready for use?
F95 INVERTER	Error with receiving the inverter message: invalid format	1) Communication error
F96 SEC. CHAIN	Security chain is triggered by an external interrupt	1) Jumper SECURITY CHAIN not plugged in 2) Cable encoder not connected 3) Jumper encoder not plugged in 4) Motor-thermo, slack rope switch 5) Inverter cable not connected
F98 BAT. EMPTY	Dalmatic encoder sends message voltage loss. Possible final position not correct.	1) Dalmatic-Encoder was without power for a long time. The battery seems to be low. Please change the battery and set the door positions.
F99 BATTERY LOW	Dalmatic encoder sends message voltage low. Battery is empty.	Please change the battery. Not possible for older encoders.

7.1   Lamp force sensing

If the force sensing triggered in the down drive, reverses the door into the upper end position. The lamp lights up permanently.

Now if permanently the ↓ button pressed, the lamp will start flashing and it is carried out a learning drive. W When the button is pressed once the doors drive in the lower end position (if the fault is permanent) and the power curve is not changed.

If you power detection in direction OPEN (pull-in protection) is triggered, the door will stop. Now the door can be drive in DEAD MAN operation in the lower end position. The LED is permanently on.

If now the ↑ button is held until the door has reached the upper limit position, a new power curve is learned. If the button is pressed only once the door is drive normally and the power curve remains unchanged.

8   Technical Data

	FS-FU-1.1kW (incl. FS-FU-VOR)	Combo C1
Supply voltage	Clamp 3 FS-FU-VOR L1 230 V ~ 50Hz fuse protection on site: 16 A K characteristic	12 V DC max. 350 mA RJ 45 FS-FU-1.1kW
Control voltage external unit	--	12 V max. 300 mA
Serial port	RJ 45 RS485 communication with Combo C1	1 x RJ 45 RS485 communication with FS-FU-1.1kW 1x Molex RS485 f. rotary encoder 1x 4 pole communication RS485 FS-FU-DISP
Safety chain / emergency stop		12 DC all inputs are potential-free connected
Relay output for external relay		12 V max. 25 mA control voltage / contact load depending on the selected relay
Brake circuit	200 V DC max. 500 mA When triggered the safety chain, the relay drops out.	
Motor output	motor up to 1,1 kW 230 V 50 Hz in delta-connected. duty cycle S3 40 % motor continuous current 5,5 A motor line < 0,5 m	
Temperature range	operating -5 … + 40°C storage -15 … + 60°C	operating -5 … + 40°C storage -15 … + 60°C
Air humidity	up to 70% non-condensing	up to 70% non-condensing
Protection class	IP54 (only in connection with housing	IP54 (only in connection with housing
Performance in standby	1,4 Watt	0,54 Watt

8.1   Category / performance level

Function	Category / performance level
Power catch	Cat. 2 / PL c
Analysis 4-wire light barrier X1.1 PIN 5/7/9/11 X1.1 PIN 10/12/13/14	Cat. 2 / PL c
Analysis OSE signal X1.1 PIN 10/12/14	Cat. 2 / PL c
Safety chain X1.1 PIN 1/3	Cat. 3 / PL d

Position encoder / Speed monitoring	Cat. 2 / PL c

8.2   EG- Declaration of Conformity

EG-Declaration of Conformity
according to the EC Machinery Directive 2006/42 / RG, Annex II A

Herewith we declare that the following machine

Designation:	Frequency inverter with modular control
Type / trade name:	FS-FU-1.1kW / Combo control C1
Serial number:	201114 100 .. / 2017 00..

complies with the relevant provisions of the following directive:

Machinery Directive 2006/42 / EC
EMC Directive 2004/108 / EC
Low Voltage Directive 2006/95 / EC

Applied harmonized standards:

EN ISO 13849-1: 2008 Safety of machinery - Safety related parts of control systems
EN 60335-1:   2012 Safety electrical appliances for household and similar purposes
EN 60335-2-103: 2003 Safety electrical appliances for household and similar purposes
                             - Particular requirements for actuators for gates, doors and windows
EN 61000-6-1:   2007 EMC: Grounding principle - Immunity (residential area)
EN 61000-6-2:   2006 EMC: Grounding principle - Immunity (industrial area)
EN 61000-6-3:   2007 EMC: Grounding principle - Emissivity (residential area)
EN 61000-6-4:   2007 EMC: Grounding principle - Interference emission (industrial area)

Applied national technical specifications:

EN 12453:   2001 Safe use of power operated gates
                          - Requirements chapter 5.2 Drive systems and power supply

Authorized representative for the compilation of the relevant technical documentation:

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Billerbeck, 08.08.2017   Peter Menke, CEO Eurodoors GmbH

Checked by:
TÜV NORD CERT GmbH (NB0044)
Langemarckstr. 20
45141 Essen
EC type-examination certificate no. 44 205 17081101

This inspection body is responsible in the sense of Annex XI of the EC Machinery Directive!
This declaration confirms the conformity with the above mentioned directives, but does not include any guarantee of properties. Please refer to the enclosed product documentation and in particular the safety instructions contained in it.
It is forbidden to commission the gate control until it has been installed on a gate and this gate complies with the provisions of the EC Machinery Directive.

EG-Konformitäts-Erklärung
Declaration of conformity

Herewith we declare the company

Eurodoors GmbH
Friethöfer Kamp 10
D-48727 Billerbeck

the declares conformity of the product

Designation: **Frequency inverter with modular control**

Type: **FS-FU-1.1kW / Combo control C1**
SN: **2114 100..   / 2017 00..**

with applicable regulations below

EC directive

EMC Directive: 89/336 / EEC

machinery directive 2006/42/EG
with changes

harmonized standards applied:
EN 12453 / 02.2001: Safe use of power - operated gates - Requirements
EN 12445 / 02.2001: Operational safety of power operated gates - Test methods
EN 12978 / 09.2003: Gates-Protective Devices-Requirements Test Procedures
EN 60335-1 / 2012 Safety electrical appliances for domestic use
EN 61000-6-1 / 08.2002: EMC: Grounding principle - Interference immunity (residential area)
EN 61000-6-2 / 02.2005: EMC: Grounding Principle - Immunity (Industrial Area)
EN 61000-6-3 / 08.2002: EMC: Grounding principle - Interference emission (residential area)
EN 61000-6-4 / 08.2002: EMC: Grounding principle - Interference emission (industrial area)

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Billerbeck, 08.08.2017   Peter Menke, CEO Eurodoors GmbH

This inspection body is responsible in the sense of Annex XI of the EC Machinery Directive!
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properties. Please refer to the enclosed product documentation and in particular the safety instructions contained in it.