

## Parameter Description

### Total Overview



**TST FUF2**

Version:

**-A / -C / -F**

**TST FU3F**

Version:

**-A / -C / -F**

** ATTENTION**

This document is a detailed documentation of the associated door controller.

The safety instructions and installation recommendations of the control manual shall be followed.

The functional description employs the following characters to indicate the different danger areas and useful tips.

** ATTENTION**

indicates a risk to persons if the procedure is not carried out as described.

** WARNING**

indicates that the controller is at risk.



points out information which is **IMPORTANT** to the operation of the gate controller and/or the gate.

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## 1 Door Cycle Counter

P.	[Unit] Range	Function	Description/ Note
P.000 rrr	[Cycles]	cycle counter	The content of this parameter indicates the number of previously counted cycles.

## 2 Maintenance counter

P.	[Unit] Range	Function	Description/ Note
P.005 rrr	[Cycles]	Maintenance counter	The content of this parameter indicates the number of cycles remaining until maintenance is due.   <i>The setting -1 means that the maintenance counter has not yet been activated.</i>
P.973 -ww	0 ... 1	Resetting the maintenance counter	By setting this parameter to 1 the maintenance counter is reset.

## 3 Hold open times / Auto close times

 Which Auto close time runs depends on the arrived end position and on the OPEN command used. For each OPEN command you can use Parameter P.5x4 to set separately whether and which Auto close time runs.  
(X = Number of used input).

P.	[Unit] Range	Function	Description/ Note
P.010 www	[Seconds] 0 ... 9999	Auto close time 1	The door is held in the end position door OPEN for the set time. The door is then automatically closed.
P.011 www	[Seconds] 0 ... 9999	Auto close time 2	The door is held in the end position Intermediate Stop / Partial open for the set time. The door is then automatically closed.

#### 4 Pre-warning time before door movement / Clearance time

P.	[Unit] Range	Function	Description/ Note
P.025 -rr	[Seconds] 0 ... 20	Pre-warning time before closing	The closing move is delayed following receipt of a CLOSE command or after expiration of the auto close time (forced close) by the time specified in this parameter.
P.026 --r	0 ... 1	Pre-warning time before closing from between the end positions	By activating this parameter the pre-warning time runs always before closing, independent from the input, also between end positions and not only in end position OPEN. The used time is set by P.025.  0: Pre-warning time set by input 1: Pre-warning time always active

#### 5 Oncoming traffic

P.	[Unit] Range	Function	Description/ Note
P.892 -zz	0 ... 1	Oncoming traffic control	With this parameter the oncoming traffic function is activated. If activated the direction information of an open command (P.5x6) is used to control the traffic lights and the hold open time.  0: The oncoming traffic function is deactivated. The programmed direction with P.5x6 of relevant commands is not evaluated. Internal the direction is set to "both directions" (P.5x6 = 3). 1: The oncoming traffic function is active. The direction set by P.5x6 is evaluated. Traffic lights and hold open time are influenced by the used direction.

#### 6 Forced closing time

P.	[Unit] Range	Function	Description/ Note
P.012 -ww	[Seconds] 0 ... 200	Forced closing time	The closing starts after the time set with this parameter. The time starts as soon as no opening or closing is active. The hold open time and the clearance time have a higher priority. That means if one of these times is running the forced closing time will not run. The same is if the door or barrier is in the open position by switching on the controller.

## 7 Motor settings

The motor ratings are used to teach the door controller what it needs to know about the motor used.

**i** The setting -1 means that this parameter is automatically queried during start-up of the door controller.

P.	[Unit] Range	Function	Description/ Note
P.100 -ww	[Hz] 30 ... 200	Motor rated frequency	The motor rated frequency indicated on the nameplate is entered here.
P.101 -ww	[A] 0,0 ... 12,0	Motor rated current	The motor rated current indicated on the nameplate is entered here.

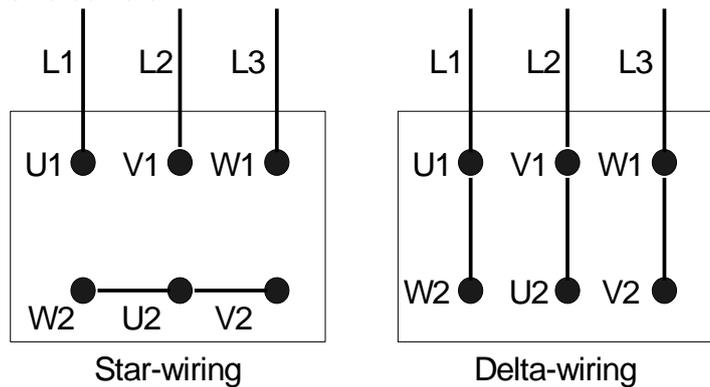


Figure 1 Star / Delta wiring



**Note Star / Delta wiring of the motor !**

P.102 -ww	[%] 40 ... 100	Power factor cos Phi	The power factor indicated on the nameplate is entered here.
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**i** The entry is made without the leading "0".  
63 thus means cos Phi 0.63.

P.103 -ww	[Volt] 100 ... 500	Motor rated voltage	The motor rated voltage indicated on the nameplate is entered here.
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**i** Switching the motor windings to 400V operation makes no sense with 230 V supplied controllers, since they can output a maximum of 230V !



**Note Star /Delta switching of the motor !**  
(see Fig. In parameter P.101: Star / Delta wiring)

P.	[Unit] Range	Function	Description/ Note
P.110 -zz	0 ... 0	Drive profile	<p>This profile is used to set the motor rated data for a known motor.</p> <p>0: Manual setting of the motor rated data</p> <p><b>i</b> <i>The exact settings which this profile involves can be found in Appendix: Drive Profile.</i></p>
P.115 -ww	1,0 ... 3,0	Motor current regulator	<p>The motor current regulator starts working at the set factor of the motor nominal current and tries to go below this value.</p> <p><b>i</b> <i>0 = Deactivated</i></p>
P.116 --w	[%] 1 ... 100	DC bus current limiter	<p>The parameter specifies at what percentage, of the long-term permitted value, the DC bus current is limited.</p> <p><b>i</b> <i>0 = Deactivated</i></p>
P.117 -ww	0 ... 1	cos phi Regulator - (Eco Modus)	<p>The cos phi regulator regulates the phase angle between current and voltage to the nominal cos phi (P.102) in the part-load operational range of the motor by reducing the motor voltage. This function prevents thermal loss in the motor and frequency inverter.</p> <p>0: cos phi regulator turned off 1: cos phi regulator turned on</p> <p><b>i</b> <i>In individual cases it may be necessary to slightly reduce the setting to P.102 to make the door running dynamic.</i></p> <p><b>i</b> <i>For very small nominal current of the motor used may be a proper operation of the controller is no longer possible. The motor might possibly remain.</i></p>
P.130 -ww	0 ... 1	Motor rotary field	<p>This parameter specifies the rotary field of the motor for OPEN move.</p> <p>0: Right rotating 1: Left rotating</p>

## 8 Boost

Boost is used to increase the power of drives in the lower speed range.

Either a too little or a too high boost setting can result in improper door movement. If too much boost is already set, this will result in an overcurrent error (F.510/F.410). In this case you must reduce the boost. If the boost is low or 0 and the motor still has insufficient force to move the door, you must increase the boost.

Due to the large number of possible door/gate types, the correct boost setting should be determined experimentally. The diagnostic function for motor current (see Parameter P.910) can be helpful here. By using the current indicator you can easily determine whether the changed setting has achieved the desired results.

**i** The boost should always be set as low as possible, but high enough to do the job.

P.	[Unit] Range	Function	Description/ Note
P.140 -ww	[%] 0 ... 30	Boost for OPEN	The boost increases the output voltage and thus the power in the lower speed range until the cutoff frequency (P.100) is reached. The voltage is increased by the value in percent of the motor rated voltage (P.103) entered in the parameter.

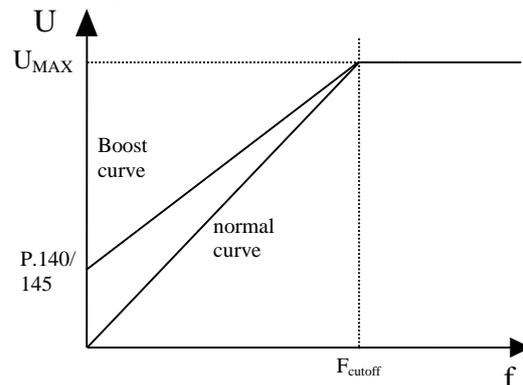


Figure 2 Boost characteristic

P.145 -ww	[%] 0 ... 30	Boost for CLOSE	see Parameter P.140
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## 9 I x R compensation

I x R compensation increases the voltage and with it the motor power only in the lower speed range.

P.	[Unit] Range	Function	Description/ Note
P.142 --w	[Hz] 0 ... 20	IxR compensation for OPEN	In this parameter you specify the frequency up to which I x R compensation is in effect. The voltage is held to the same value below this frequency. The voltage value is derived from the voltage which is normally output for the frequency set here.

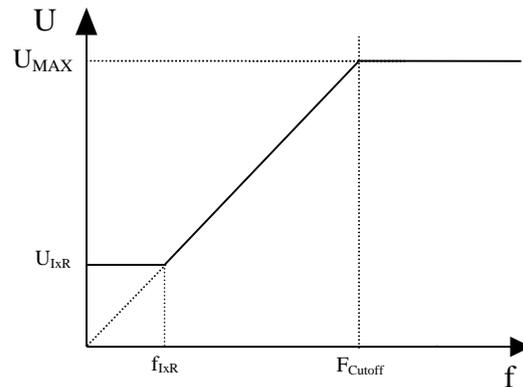


Figure 3 IxR compensation characteristic curve

P.147 --w	[Hz] 0 ... 20	IxR compensation for CLOSE	see Parameter P.142
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## 10 Voltage reduction

Reducing the motor voltage which is output prevents over-excitation of the motor. This reduces power dissipation and noise.

P.	[Unit] Range	Function	Description/ Note
P.143 --w	[%] 35 ... 100	Voltage reduction for OPEN	The indicated value specifies what percent of the output voltage is given out.

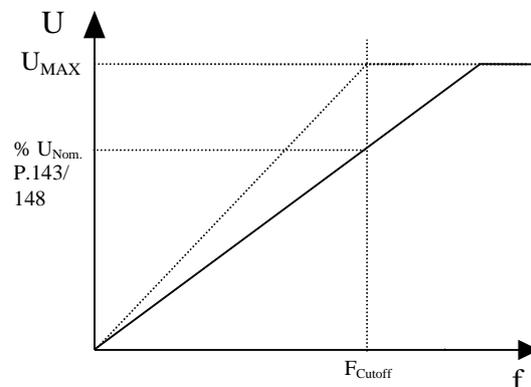


Figure 4 Voltage reduction characteristic curve

P.	[Unit] Range	Function	Description/ Note
P.148 --w	[%] 35 ... 100	Voltage reduction for CLOSE	see Parameter P.143

## 11 Brake settings

P.	[Unit] Range	Function	Description/ Note
P.183 --r	[A] 0,5 ... 2,5	Working current of the mechanical brake	With this Parameter the expected working current of the 24 V DC brake is set. If the real current differs around +/- 0.5 A the error F.926 is shown.



## 12 Selecting the positioning system

P.	[Unit] Range	Function	Description/ Note
P.202 -rr	0 ... 20	Transmission ratio	With this parameter the transmission ratio of the encoder to the motor is set. As faster the drive shaft is as higher has the parameter value to be.
P.205 -ww	0000 ... 0900	Selecting the positioning system profile	This profile sets the limit switch system. Select from the following settings:



*This parameter is only visible in case of TST PD is connected and set as limit switch.*

- 0000: Mechanical limit switches 1. The absolute limit switches are processed as normally closed and the pre-limit switches as normally open.
- 0001: Mechanical limit switches 2. All limit switches are processed as normally closed.
- 0200: Incremental encoder
- 0300: Absolute encoder DES-A with 9600 Baud (GfA)
- 0700: Absolute encoder DES-B (Kostal)
- 0800: Absolute encoder TST PD / TST PE
- 0900: Mechanical limit switches assists by timer (incremental mode)



*This function is working only in automatic mode*



*The exact settings which this profile involves can be found in Appendix: Position Sensor Profile.*



**In addition, the standard functions of the controller inputs are matched to the limit switch type in use.**

## 13 End position correction

P.	[Unit] Range	Function	Description/ Note
P.210 -ww	0 ... 5	New teaching of the end positions	<p>This parameter is used to start a new teaching of the end positions. The corresponding end positions are moved to in deadman mode after activating the procedure and saved by holding down the Stop key. Select from the following settings:</p> <ul style="list-style-type: none"> <li>0: Cancel, no end positions are taught.</li> <li>1: Limit switch Lower, limit switch Upper and if appropriate limit switch Intermediate Stop are taught.</li> <li>2: Limit switch Upper and if appropriate limit switch Intermediate Stop are taught.</li> <li>3: Limit switch Lower and limit switch Upper are taught.</li> <li>4: Limit switch Intermediate Stop is taught.</li> <li>5: All limit switches and the turn direction are taught.</li> </ul> <p><b>i</b> <i>Teaching the Intermediate Stop limit switch depends on the setting in Parameter P.244 (see section Partial Opening / Intermediate Stop).</i></p>
P.215 -ww	0 ... 1	Requesting correction of the pre-limit switch and limit switch bands	<p>If automatic calculation of the pre-limit switch and limit switch bands (P.216) is activated, this parameter can be used to start a new teaching of the pre-limit switch and limit switch bands.</p> <ul style="list-style-type: none"> <li>0: Make no correction.</li> <li>1: Start correction of the pre-limit switch and limit switch bands.</li> </ul> <p><b>i</b> <i>Correction of the pre-limit switch and limit switch bands is only possible if P.216 = 2.</i></p>

P.	[Unit] Range	Function	Description/ Note
P.216 --w	0 ... 4	Activating auto correction / Selecting the ramp setting mode	<p>There are two basic ways to set the steepness of a ramp. The ramp time can be set in milliseconds, or the ramp acceleration can be set in Hz per second. In addition, the limit switch bands are automatically set when Automatic is activated.</p> <p>0: Ramp times have to be set manually (as in earlier door controllers from FEIG ELECTRONIC GmbH).  1: Ramp acceleration has to be set manually.  2: Ramp acceleration has to be set and limit switches are automatically set.</p> <p> <b>In case of changing the speed of the door or one of the ramp accelerations the automatically setting of the pre limit switches and limit switch bands will start again. The values set in the corresponding parameters are then overwritten.</b></p> <p>3: like 2, but no automatic correction by reaching the limit too fast (I.100 / I.150) after the teach-in was ready one time.  4: Calculation of the pre-limit switch, even if the full speed cannot be achieved. Message I.520</p> <p> <i>Automatic teaching of the limit switches and pre limit switches only functions if accelerations for ramps are set. You cannot use ramp times as they were defined in earlier versions of the controllers.</i></p> <p><b> WARNING</b>  Depending on the type of door and the used motor the limits can be overrun during automatic calculation of the limits (I.515). To prevent this P.217 has to adjust proper for the used door.</p>
P.217 --w	0 ... 600	Tolerance of automatic end switch correction	<p>With this parameter an offset is set to the end position find out by the automatic end switch correction. Because of that the door is not able to overrun the end switch position of the door by the first move. The end switch position will move by the value (in percent) adjusted with this parameter.</p>

## 14 CLOSE



If automatic setting of the pre-limit switches and limit switch bands is used (P.216 = 2), Parameters P.222 and P.223 are automatically changed. The parameters are even changed if the speed of the door or the steepness of a ramp is changed, since this results in a new start of automatic limit switch correction. If you want to set these ramps manually, P.216 must be < 2.

## 14.1 End position door close modify

P.	[Unit] Range	Function	Description/ Note
P.221 www	[Increments] -125 ... 125	Correction value End position door CLOSE	<p>This parameter is used to shift the entire lower end position, i.e., the end position is shifted together with the associated pre-limit switches.</p> <p>A change in the parameter value in the positive direction causes the end position to shift up.</p> <p>A change in the parameter value in the negative direction causes the end position to shift down.</p>

## 14.2 Start of Door Closing

P.	[Unit] Range	Function	Description/ Note
P.350 -ww	[Hz] 6 ... 200	Travel frequency for rapid CLOSE	<p>Here you specify the maximum close speed in Hz. Start ramp "r5" is used to accelerate to this speed. The steepness of the ramp is set with Parameter P.351 or P.352.</p>

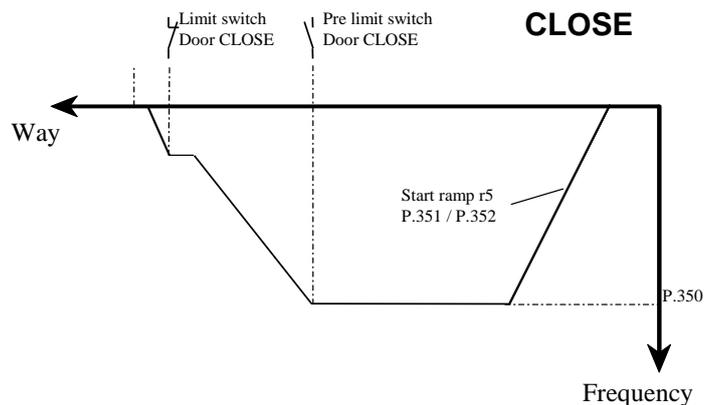


Figure 5 Start ramp, CLOSE

P.351 --w	[10 ms] 20 ... 500	Duration of start ramp "r5"	<p>Time of start ramp "r5" in milliseconds. The door is accelerated within the specified time from 0Hz to the maximum close speed (P.350).</p> <p>Smaller values result in greater acceleration of the door. Larger values result in diminished acceleration of the door.</p> <p><b>i</b> This parameter is only visible and settable if Parameter P.216 is set to 0.</p>
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P.	[Unit] Range	Function	Description/ Note
P.352 --r	[Hz/s] 5 ... 300	Acceleration of start ramp "r5"	Acceleration during start ramp "r5" in Hertz per second.  Smaller values result in diminished acceleration of the door. Larger values result in greater acceleration of the door.  <b>i</b> This parameter is only visible and settable if Parameter P.216 is greater than 0.

### 14.3 Slow down after Pre-limit switch during Door CLOSE

P.	[Unit] Range	Function	Description/ Note
P.222 --w	[Increments] 0 ... 2100	Pre-limit switch position Door CLOSE	The parameter value specifies the distance to the absolute limit switch Door CLOSE in increments. The pre-limit switch is used to initiate the brake ramp "r6". The steepness of the ramp is set with Parameter P.361 or P.362.

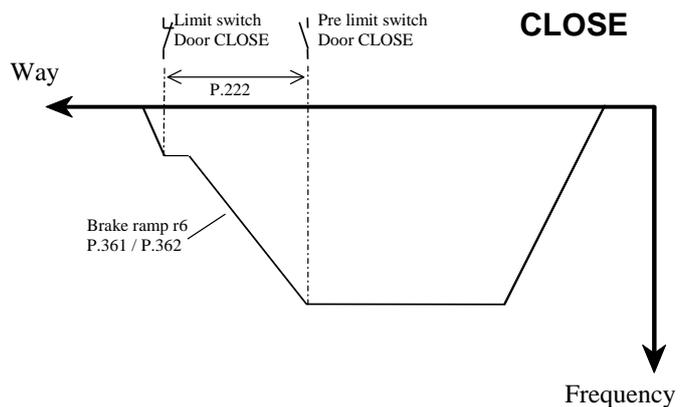


Figure 6 Pre-limit switch position Door CLOSE

P.	[Unit] Range	Function	Description/ Note
P.360 --w	[Hz] 6 ... 200	Creep speed frequency for CLOSE	Brake ramp "r6" is used to slow to creep speed frequency, and is initiated after activation of the pre-limit switch Door CLOSE. The steepness of the brake ramp "r6" is set with Parameter P361 or P.362.

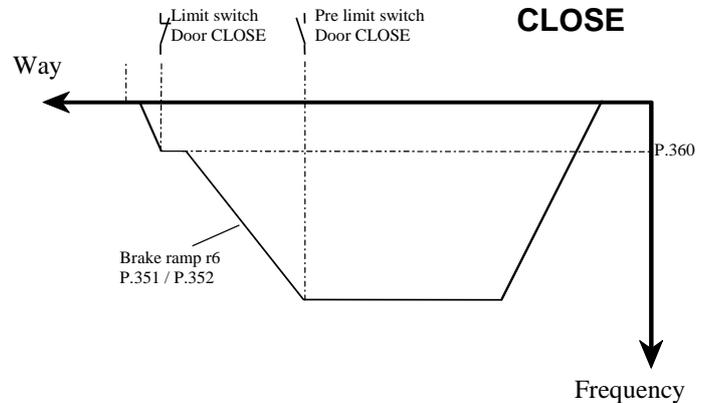


Figure 7 Creep move for CLOSE

P.361 --w	[10 ms] 15 ... 500	Duration of brake ramp "r6"	This parameter specifies the time of brake ramp "r6" in milliseconds. The door is decelerated from maximum close frequency (P350) to creep frequency (P.360) within this time.  Smaller values result in greater deceleration of the door. Larger values result in diminished deceleration of the door.  <b>i</b> This parameter is only visible and settable if Parameter P.216 is set to 0.
P.362 --r	[Hz/s] 5 ... 300	Acceleration of brake ramp "r6"	This parameter specifies the acceleration of the door during brake ramp "r6" in Hertz per second.  Smaller values result in diminished deceleration of the door. Larger values result in greater deceleration of the door.  <b>i</b> This parameter is only visible and settable if Parameter P.216 is greater than 0.

## 14.4 Stopramp after stop is triggered (CLOSE)

P.	[Unit] Range	Function	Description/ Note
P.382 --r	[Hz/s] 5 ... 600	Acceleration of stop ramp "r STOP-Z" after stop is triggered	<p>Acceleration during stop ramp "r STOP-Z" in Hertz per second.</p> <p>The door is decelerated from maximum close speed to 0 Hz after a stop command is given.</p> <p>Smaller values result in diminished acceleration of the door.</p> <p>Larger values result in greater acceleration of the door.</p> <p> This parameter is only visible and settable if Parameter P.216 is greater than 0.</p>

## 15 Open



If automatic setting of the pre-limit switch and limit switch bands is used (P.216 = 2), Parameters P.232 and P.233 are automatically changed. The parameters are even changed if the speed of the door or the steepness of a ramp is changed, since this results in a new start of automatic limit switch correction. If you want to set these ramps manually, P.216 must be < 2.

### 15.1 Adjust the end position Door open

P.	[Unit] Range	Function	Description/ Note
P.231 www	[Increments] -60 ... 60	Correction value End position Door OPEN	<p>This parameter is used to shift the entire Door OPEN end position, i.e., the end position is shifted together with the associated pre-limit switches.</p> <p>A change in the parameter value in a positive direction causes the end position to shift up.</p> <p>A change in the parameter value in the negative direction causes the end position to shift down.</p>

## 15.2 Start Door Opening

P.	[Unit] Range	Function	Description/ Note
P.310 -ww	[Hz] 6 ... 200	Travel frequency for rapid OPEN	Here you specify the maximum open speed in Hz. Start ramp "r1" is used to accelerate to this speed. The steepness of the ramp is set with Parameter P.311 or P.312.

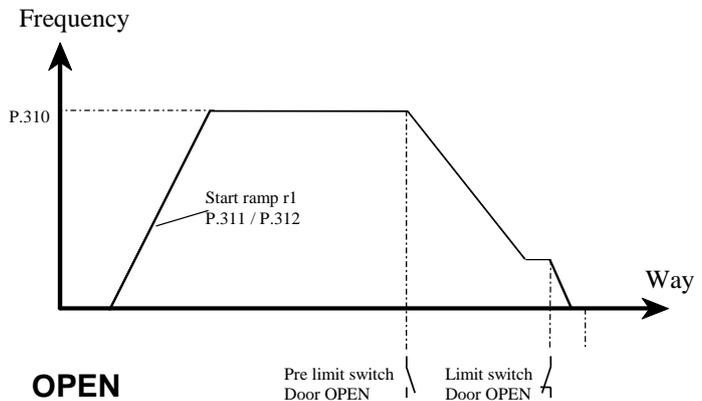
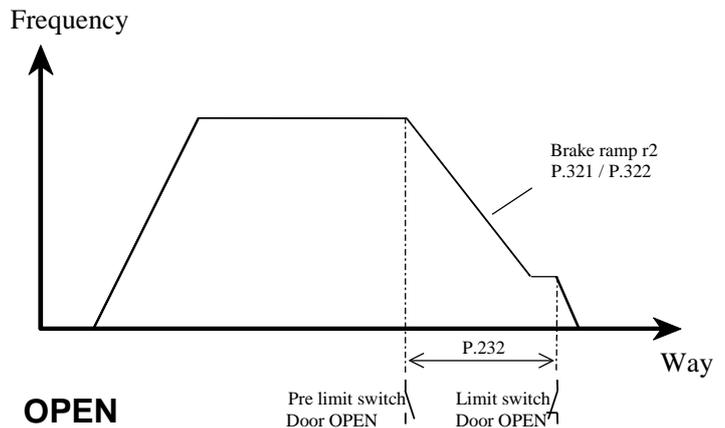


Figure 8 Start ramp, OPEN move

P.311 --w	[10 ms] 20 ... 500	Duration of start ramp "r1"	<p>Time of start ramp "r1" in milliseconds. The door is accelerated within the specified time from 0Hz to the maximum open speed (P.310).</p> <p>Smaller values result in greater acceleration of the door. Larger values result in diminished acceleration of the door.</p> <p><b>i</b> This parameter is only visible and settable if Parameter P.216 is set to 0.</p>
P.312 --r	[Hz/s] 5 ... 300	Acceleration of start ramp "r1"	<p>Acceleration during start ramp "r1" in Hertz per second.</p> <p>Smaller values result in diminished acceleration of the door. Larger values result in greater acceleration of the door.</p> <p><b>i</b> This parameter is only visible and settable if Parameter P.216 is greater than 0.</p>

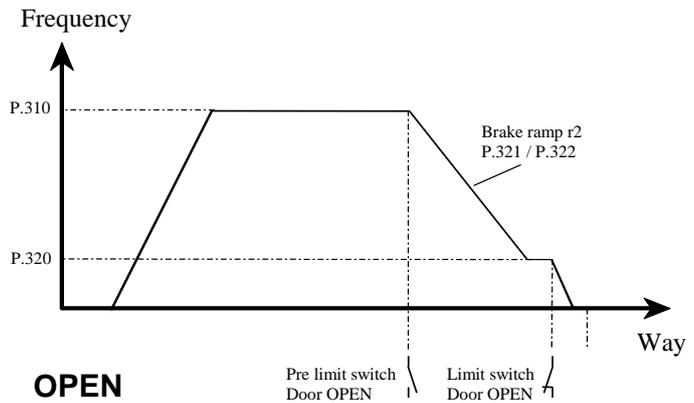
**15.3 Slow down after pre-limit switch is triggered during Door OPEN**

P.	[Unit] Range	Function	Description/ Note
P.232 --w	[Increments] 0 ... 2100	Pre-limit switch position Door OPEN	The parameter value specifies the distance to the Door OPEN absolute limit switch in increments. The pre-limit switch is used to initiate the brake ramp "r2". The steepness of the ramp is set with Parameter P.321 or P.322.



**Figure 9 Pre-limit switch position Door OPEN**

P.320 --w	[Hz] 6 ... 200	Creep speed frequency for OPEN	Brake ramp "r2" is used to slow to creep speed frequency, and is initiated after activation of the pre-limit switch Door OPEN. The steepness of the brake ramp "r2" is set with Parameter P321 or P.322.
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**Figure 10 Creep move for OPEN**

P.	[Unit] Range	Function	Description/ Note
P.321 --w	[10 ms] 15 ... 500	Duration of brake ramp "r2"	<p>This parameter specifies the acceleration of the door during brake ramp "r2" in Hertz per second.</p> <p>Smaller values result in diminished deceleration of the door. Larger values result in greater deceleration of the door.</p> <p> <i>This parameter is only visible and settable if Parameter P.216 is greater than 0.</i></p>
P.322 --r	[Hz/s] 5 ... 300	Acceleration of brake ramp "r2"	<p>This parameter specifies the acceleration of the door during brake ramp "r2" in Hertz per second.</p> <p>Smaller values result in diminished deceleration of the door. Larger values result in greater deceleration of the door.</p> <p> <i>This parameter is only visible and settable if Parameter P.216 is greater than 0.</i></p>

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#### 15.4 Stop ramp after stop is triggered (OPEN)

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P.	[Unit] Range	Function	Description/ Note
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P.340 --w	[10 ms] 15 ... 250	Duration of stop ramp "r STOP-A" after stop is triggered	Time of stop ramp "r STOP-A" in milliseconds. The door is decelerated in the specified time from maximum open speed to 0 Hz after triggering of a stop command.
--------------	-----------------------	--	--

Smaller values result in greater acceleration of the door.  
Larger values result in diminished acceleration of the door.

Frequency

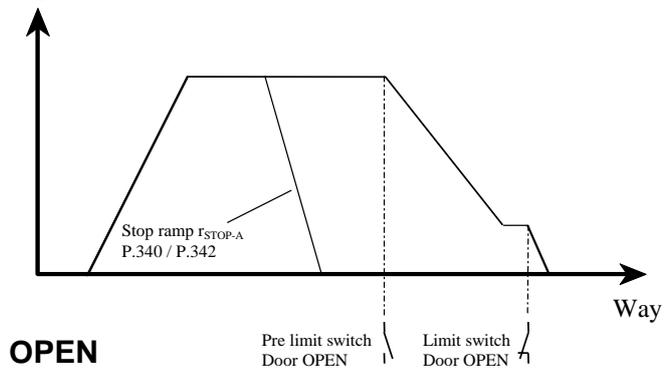


Figure 11 Triggering of Stop for OPEN move

**i** This parameter is only visible and settable if Parameter P.216 is set to 0.

P.342 --r	[Hz/s] 5 ... 300	Acceleration of stop ramp "r STOP-A" after stop is triggered	Acceleration during stop ramp "r STOP-A" in Hertz per second. The door is decelerated from maximum open speed to 0 Hz after a stop command is given.
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Smaller values result in diminished acceleration of the door.  
Larger values result in greater acceleration of the door.

**i** This parameter is only visible and settable if Parameter P.216 is greater than 0.

## 16 Incremental encoder / Synchronisation

### 16.1 Incremental encoder

P.	[Unit] Range	Function	Description/ Note
P.259 -ww	0 ... 1	Counting direction incremental encoder	With this parameter the counting direction of the incremental encoder can be set  0: Counting up: Channel B before Channel A Counting down: Channel A before Channel B 1: Counting up: Channel A before Channel B Counting down: Channel B before Channel A

### 16.2 Synchronization type

P.	[Unit] Range	Function	Description/ Note
P.25F -ww	0 ... 10	Synchronization type profile	This profile is used to set the reference switches and automatic synchronization mode.  0: Deactivated 1: Synchronization to reference switch in Door CLOSE Endposition. 2: Synchronization to safety edge. 3: Synchronization to reference switch in Door OPEN endposition. 4: Synchronization to mechanical stop in Door OPEN endposition. 5: Synchronization to safety edge and then to mechanical stop in Door OPEN endposition. 6: Synchronization to safety edge and then to reference switch in Door OPEN endposition. 7: Synchronization to reference switch in Door CLOSE endposition and then to mechanical stop in Door OPEN Endposition. 8: Synchronization to mechanical stop in Door CLOSE Endposition and then to mechanical stop in Door OPEN Endposition. 9: Manual synchronization to Door CLOSE Endposition and to Door OPEN Endposition. 10: Timer-limit switch-mode. Synchronisation is done automatically to end switch CLOSE and OPEN.

 *The exact settings which this profile involves can be found in Appendix: Synchronization Type.*

## 17 Specialization of safety functions

P.	[Unit] Range	Function	Description/ Note
P.8BA --w	0 ... 4	Specialization of a safety function A to E in operating mode 7	<p>Specialization of a safety function in operating mode 7. When function is activated, after tripping the safety edge during opening, a close command is generated. The behavior after reaching the end position door close can be selected by the control options.</p> <ul style="list-style-type: none"> <li>0: Disabled, tripping the safety edge during opening will just stop the door.</li> <li>1: Door closes after safety is free and opens again when door is closed.</li> <li>2: Door closes slowly after safety is free and opens again when door is closed.</li> <li>3: Door closes slowly after safety is free and stops in endposition close.</li> <li>4: Door closes after safety is free, without opening when door is closed.</li> </ul>

## 18 Light Curtain

P.	[Unit] Range	Function	Description/ Note
A.480	0 ... 1	Application	<p>This parameter activates the Light curtain and automatically sets all the necessary parameters and input functions.</p> <ul style="list-style-type: none"> <li>0: Light curtain deactivated</li> <li>1: Light curtain activated</li> </ul>
P.44A -ww	[m] 0,5 ... 10,0	Range	This parameter sets the beam intensity or the door width in increments of 0.5 m.
P.931 rrr		Software version transmitter	Shows the software version of the transmitter.
P.932 rrr		Software version receiver	Shows the software version of the receiver.
P.933 -rr		Serial number transmitter	Displays the serial number of the transmitter.
P.934 -rr		Serial number receiver	Displays the serial number of the receiver.
P.935 -rr	[Digits]	Error bit transmitter	Display the "System error bitmask" of transmitter.
P.936 -rr	[Digits]	Error bit receiver	Display the "System error bitmask" of receiver.
P.937 -ww		Aligning mode	<p>Activation of the alignment mode in the light curtain (LED flashing codes).</p> <ul style="list-style-type: none"> <li>0: Alignment mode deactivated.</li> <li>1: Alignment mode activated.</li> </ul>

P.	[Unit] Range	Function	Description/ Note
P.938 -rr		Light line quality	Diagnostic display for commissioning as alignment aid or for troubleshooting purposes. Requires activation of P.937.
P.93C zww		Error counter RS485	The number of faulty protocols of the RS485 interface between the transmitter and the receiver of the light curtain is displayed.   <i>The counter can be reset by holding the Stop key pressed.</i>

## 19 Radio safety system

P.	[Unit] Range	Function	Description/ Note
P.92A rrr		Softwareversion FSx mobile unit	Software version of the mobile unit of the wireless safety device.
P.92B rrr		Software version FSx stationary unit	Software version of the stationary unit of the wireless safety device.
P.9F0 -ww	[%] 0 ... 100	Capacity of battery	This parameter shows the actual capacity of the battery.   <i>In order to set the value back to 100%, e.g. after changing the battery, you have to press the stop key for a long time.</i>
P.9F1 -rr	[Volt]	Battery voltage of radio safety system	Shows the battery voltage of the mobile unit if the radio safety system.
P.9F2 -rr	[%]	Wireless status	Shows the quality of the radio link to the mobile unit of the radio safety system.
P.F00 -ww	0 ... 1	Activation of the wireless	Activation of the wireless  0: Deactivated 1: Activated
P.F01 -zz	[ms] 6 ... 250	Timeout for the wireless	Defines the time in which the radio safety system is set as tripped in case of a radio interruption.
P.F05 -ww	1 ... 10	Channelgroup	Sets the channel group which the radio safety system is using.

P.	[Unit] Range	Function	Description/ Note
P.F07 -ww	00000000 ... 0FFFFFFF	Address of the mobile unit	Address of the mobile unit with which the wireless security system should communicate

**⚠ ATTENTION**

After entering the address it is necessary to check whether the controller is connected to and works with the selected mobile unit.

**i** It is also possible to “learn” the address automatically. To do this, the parameter must be set to - then the mobile unit must be reset by removing the battery. The address is then entered into the parameter and can be saved

P.F09 -ww	[Volt] 1,2 ... 3,6	Battery nominal voltage	Here the nominal voltage of the battery is put in.
P.FF2 -zz	0 ... 2	Mode output 2	Output mode of the output No. 2 Function is available from software version TST FSx-ST-V00-04.05 of the Stationary unit.  0: Automatic. If a digital Input is linked to this output, the output signal is digital. If a analogue input or mixed inputs are linked to this output the output signal is analogue. 1: Analogue output signal 2: Digital output signal

## 19.1 FSx input profiles

**i** The settings that may be necessary for these profiles are available from the attachments.

P.	[Unit] Range	Function	Description/ Note
A.F00	0000 ... 21BB	FSx Wireless safety system profile	This Profile activates the radio safety system TST FSx and sets configurations for the typical door applications.  0000: No profile set 10BB: Sectional door, WiCab PE_FSBS and FSBM 20AA: Rolling door, WiCab PD_FSAS and FSAM 20BA: Rolling door, WiCab PE_FSBS and FSAM 20BB: Rolling door, WiCab PE_FSBS and FSBM 21AA: Rolling door with breakaway sensor, WiCab PD_FSAS and FSAM 21BA: Rolling door with breakaway sensor, WiCab PE_FSBS and FSAM 21BB: Rolling door with breakaway sensor, WiCab PE_FSBS and FSBM

P.	[Unit] Range	Function	Description/ Note
P.F1F -ww	0000 ... F302	Function input 1	<p>Selection of the Input configuration for the input 1 of the FSx unit.</p> <p>0000: Deactivated  F101: Safety edge 8K2  F102: Dynamical optical safety edge  F103: Like F101 but takes effect to output 2 of the stationary unit  F104: 8K2 safety edge on output 3, for FSA digital put thru of an 8K2 input.  F201: Flap door switch digital  F202: Flap door switch 8k2  F203: Slack rope switch digital  F206: Thermo pill  F207: Crank switch  F301: Crash impulse switch with handshake  F302: crash static</p>
P.F2F -ww	0000 ... F302	Function input 2	<p>Selection of the Input configuration for the input 2 of the FSx unit.</p> <p>0000: Deactivated  F101: Safety edge 8K2  F102: Dynamical optical safety edge  F103: Like F101 but takes effect to output 2 of the stationary unit  F104: 8K2 safety edge on output 3, for FSA digital put thru of an 8K2 input.  F201: Flap door switch digital  F202: Flap door switch 8k2  F203: Slack rope switch digital  F206: Thermo pill  F207: Crank switch  F301: Crash impulse switch with handshake  F302: crash static</p>
P.F3F -ww	0000 ... F302	Function input 3	<p>Selection of the Input configuration for the input 3 of the FSx unit.</p> <p>0000: Deactivated  F101: Safety edge 8K2  F102: Dynamical optical safety edge  F103: Like F101 but takes effect to output 2 of the stationary unit  F104: 8K2 safety edge on output 3, for FSA digital put thru of an 8K2 input.  F201: Flap door switch digital  F202: Flap door switch 8k2  F203: Slack rope switch digital  F206: Thermo pill  F207: Crank switch  F301: Crash impulse switch with handshake  F302: crash static</p>

P.	[Unit] Range	Function	Description/ Note
P.F4F -ww	0000 ... F302	Function input 4	<p>Selection of the Input configuration for the input 4 of the FSx unit.</p> <p>0000: Deactivated            F101: Safety edge 8K2            F102: Dynamical optical safety edge            F103: Like F101 but takes effect to output 2 of the stationary unit            F104: 8K2 safety edge on output 3, for FSA digital put thru of an 8K2 input.            F201: Flap door switch digital            F202: Flap door switch 8k2            F203: Slack rope switch digital            F206: Thermo pill            F207: Crank switch            F301: Crash impulse switch with handshake            F302: crash static</p> <p> This parameter is visible only in connection with TST FSBM mobile unit.</p>

## 19.2 FSx input 1

P.	[Unit] Range	Function	Description/ Note
P.F10 -zz	0 ... 4	Mode input 1	<p>Defines the operation mode of input 1 of the mobile unit.</p> <p>0: Deactivated            1: Analogue evaluation with 8K2 Ohm            2: Analogue evaluation with 1K2 Ohm            3: Dynamic optical system            4: Digital evaluation</p>
P.F11 -zz	0 ... 2	Safety	<p>This parameter specifies how the input will work after the radio signal is missing.</p> <p>0: Input active at missing radio signal and always in sleepmode.            1: Input active at missing radio signal            2: The last status of the input is given out (missing radio signal and sleepmode doesn't change the output)</p>
P.F12 -zz	0 ... 1	Contact type of the input	<p>Specifies the contact type of the switch which is connected to the input.</p> <p>0: Normally open            1: Normally closed</p>

P.	[Unit] Range	Function	Description/ Note
P.F13 -ZZ	0 ... 1	Debouncing time	This Parameter determine the debouncing time for the Input  0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F16 -ZZ	1 ... 3	Output	With this parameter the allocation from the input 1 of the mobile unit to the stationary unit is done.  1: Output 1 2: Output 2 3: Output 3
P.F17 -ZZ	0 ... 2	Direction 1	Drive direction at which the safety, connected on input 1, must be activated (at the moment only for optical systems evaluated).  0: Both directions 1: Door opening 2: Door closing
P.F18 -ZZ	0 ... 1	Handshake	With this Parameter a Handshake between an input of the mobile unit and an controller input can be activated. If the input of the mobile unit is tripped, the tripping will store and shown as long as the controller has confirmed it. Because of this e.g. a crash tripping during switched off controller will not get lost.  0: Handshake deactivated 1: Handshake between input of mobile unit and controller activated.   <b>The software version of the mobile unit as well as the the software version of the stationary unit must support this function (from version Vxx-04.04 possible).</b>
P.F19 -ZZ	0 ... 62	LCD Messages	Select the LCD Messages which are shown in the Display   <i>The list of messages can be found in the Appendix LCD Messages</i>

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**19.3 FSx input 2**


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P.	[Unit] Range	Function	Description/ Note
P.F20 -ZZ	0 ... 4	Mode input 2	Defines the operation mode of input 2 of the mobile unit.  0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation
P.F21 -ZZ	0 ... 2	Safety	This parameter specifies how the input will work after the radio signal is missing.  0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn't change the output)
P.F22 -ZZ	0 ... 1	Contact type of the input	Specifies the contact type of the switch which is connected to the input.  0: Normally open 1: Normally closed
P.F23 -ZZ	0 ... 1	Debouncing Time	This Parameter determine the debouncing time for the Input  0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F26 -ZZ	1 ... 3	Output	With this parameter the allocation from the input 2 of the mobile unit to the stationary unit is done.  1: Output 1 2: Output 2 3: Output 3
P.F27 -ZZ	0 ... 2	Direction 2	Drive direction at which the safety is activated (Only for optical systems)  0: Both directions 1: Door opening 2: Door closing

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P.	[Unit] Range	Function	Description/ Note
P.F28 -ZZ	0 ... 1	Handshake	<p>With this Parameter a Handshake between an input of the mobile unit and a controller input can be activated. If the input of the mobile unit is tripped, the tripping will store and shown as long as the controller has confirmed it. Because of this e.g. a crash tripping during switched off controller will not get lost.</p> <p>0: Handshake deactivated 1: Handshake between input of mobile unit and controller activated.</p> <p><b>i</b> <i>The software version of the mobile unit as well as the the software version of the stationary unit must support this function (from version Vxx-04.04 possible).</i></p>
P.F29 -ZZ	0 ... 62	LCD Messages	<p>Select the LCD Messages which are shown in the Display</p> <p><b>i</b> <i>The list of messages can be found in the Appendix LCD Messages</i></p>

#### 19.4 FSx input 3

P.	[Unit] Range	Function	Description/ Note
P.F30 -ZZ	0 ... 4	Mode input 3	<p>Defines the operation mode of input 3 of the mobile unit.</p> <p>0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation</p>
P.F31 -ZZ	0 ... 2	Safety	<p>This parameter specifies how the input will work after the radio signal is missing.</p> <p>0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn't change the output)</p>
P.F32 -ZZ	0 ... 1	Contact type of the input	<p>Specifies the contact type of the switch which is connected to the input.</p> <p>0: Normally open 1: Normally closed</p>

P.	[Unit] Range	Function	Description/ Note
P.F33 -ZZ	0 ... 1	Debouncing time	This Parameter determine the debouncing time for the Input  0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F36 -ZZ	1 ... 3	Output	With this parameter the allocation from the input 3 of the mobile unit to the stationary unit is done.  1: Output 1 2: Output 2 3: Output 3
P.F37 -ZZ	0 ... 2	Direction 3	Drive direction at which the safety is activated (Only for optical systems)  0: Both directions 1: Door opening 2: Door closing
P.F38 -ZZ	0 ... 1	Handshake	With this Parameter a Handshake between an input of the mobile unit and a controller input can be activated. If the input of the mobile unit is tripped, the tripping will store and shown as long as the controller has confirmed it. Because of this e.g. a crash tripping during switched off controller will not get lost.  0: Handshake deactivated 1: Handshake between input of mobile unit and controller activated.   <i>The software version of the mobile unit as well as the the software version of the stationary unit must support this function (from version Vxx-04.04 possible).</i>
P.F39 -ZZ	0 ... 62	LCD Messages	Select the LCD Messages which are shown in the Display   <i>The list of messages can be found in the Appendix LCD Messages</i>

## 19.5 FSx input 4

**i** The input 4 of the mobile unit is only possible with TST FSBM. The following parameters are only visible by using this mobile unit.

P.	[Unit] Range	Function	Description/ Note
P.F40 -ZZ	0 ... 4	Mode input 4	Defines the operation mode of input 4 of the mobile unit.  0: Deactivated 1: Analogue evaluation with 8K2 Ohm 2: Analogue evaluation with 1K2 Ohm 3: Dynamic optical system 4: Digital evaluation
P.F41 -ZZ	0 ... 2	Safety	This parameter specifies how the input will work after the radio signal is missing.  0: Input active at missing radio signal and always in sleepmode. 1: Input active at missing radio signal 2: The last status of the input is given out (missing radio signal and sleepmode doesn't change the output)
P.F42 -ZZ	0 ... 1	Contact type of the input	Specifies the contact type of the switch which is connected to the input.  0: Normally open 1: Normally closed
P.F43 -ZZ	0 ... 1	Debouncing time	This Parameter determine the debouncing time for the Input  0: Short debouncing time (3 ms) 1: Long debouncing time (30 ms)
P.F46 -ZZ	1 ... 3	Output	With this parameter the allocation from the input 4 of the mobile unit to the stationary unit is done.  1: Output 1 2: Output 2 3: Output 3
P.F47 -ZZ	0 ... 2	Direction 4	Drive direction at which the safety is activated (Only for optical systems)  0: Both directions 1: Door opening 2: Door closing

P.	[Unit] Range	Function	Description/ Note
P.F48 -ZZ	0 ... 1	Handshake	<p>With this Parameter a Handshake between an input of the mobile unit and an controller input can be activated. If the input of the mobile unit is tripped, the tripping will store and shown as long as the controller has confirmed it. Because of this e.g. a crash tripping during switched off controller will not get lost.</p> <p>0: Handshake deactivated 1: Handshake between input of mobile unit and controller activated.</p> <p><b>i</b> <i>The software version of the mobile unit as well as the the software version of the stationary unit must support this function (from version Vxx-04.04 possible).</i></p>
P.F49 -ZZ	0 ... 62	LCD Messages	<p>Select the LCD Messages which are shown in the Display</p> <p><b>i</b> <i>The list of messages can be found in the Appendix LCD Messages</i></p>

## 19.6 FSx stationary unit inputs

**i** *The stationary inputs exist only on TST PE FSB stationary unit.*

P.	[Unit] Range	Function	Description/ Note
P.FA9 -ZZ	0 ... 62	LCD- Messages	<p>Select the LCD Messages which are shown in the Display</p> <p><b>i</b> <i>The list of messages can be found in the Appendix LCD Messages</i></p>
P.FB9 -ZZ	0 ... 62	LCD Messages	<p>Select the LCD Messages which are shown in the Display</p> <p><b>i</b> <i>The list of messages can be found in the Appendix LCD Messages</i></p>
P.FC9 -ZZ	0 ... 62	LCD Messages	<p>Select the LCD Messages which are shown in the Display</p> <p><b>i</b> <i>The list of messages can be found in the Appendix LCD Messages</i></p>

## 20 Safety Edges

The following parameters can be set both for integrated safety edge processing as well as for external safety edge processing (optional for different controllers) .

## 20.1 Integrated safety edge processing

The controllers have a safety edge processor already on the motherboard.  
No additional plug-in cards are necessary.

P.	[Unit] Range	Function	Description/ Note
P.460 --r	0 ... 6	profile internal safety edge	<p>With this profile the parameter's for the function of the internal safety edge are set.</p> <ul style="list-style-type: none"> <li>0: Deactivated</li> <li>1: Electrical safety edge, redundantly processed, functioning as normally open</li> <li>2: Electrical safety edge, redundantly processed, functioning as normally closed</li> <li>3: Electrical safety edge with testing in Door close end position, functioning as normally open</li> <li>4: Electrical safety edge with testing in Door close end position, functioning as normally closed</li> <li>5: Dynamic optical system</li> <li>6: Automatically detection of the connected safety edge. Electrical N.O. edges and dynamic optical systems are recognised automatically.</li> </ul> <p> <i>The exact settings which this profile involves can be found in the Appendix :Safety edge profile</i></p>
P.466 -zz	0 ... 2	External testing of safety edge	<p>With this parameter a testing of the safety edge can requested. Testing is possible in door CLOSE or OPEN position.</p> <ul style="list-style-type: none"> <li>0: No test</li> <li>1: Test in the endposition Door Open and after start up of the controller</li> <li>2: Test in the endposition Door Close and after start up of the controller</li> </ul>

## 21 Input profiles

P.	[Unit] Range	Function	Description/ Note
P.501 --w	0000 ... 1804	Function of Input 1	<p>This profile can be used to specify the function of the input. All parameters needed for the function of the input are changed in one step.</p> <p>0000: Input deactivated</p> <p>0101: OPEN1, NO contact, OPEN till final position is reached, with hold open time, with clearance time, both directions</p> <p>0102: OPEN1, NO contact, till intermediate stop, with hold open time, with clearance time, both directions</p> <p>0103: OPEN lockage, NO contact, till intermediate stop, with hold open time, with clearance time, both directions</p> <p>0104: OPEN 1, NO contact, till intermediate stop, with hold open time, with clearance time, direction from the outside</p> <p>0105: OPEN 2, NO contact, OPEN till final position is reached, with hold open time, with clearance time, both directions</p> <p>0106: OPEN 2, NO contact, OPEN till final position is reached, with hold open time, with clearance time, direction from the inside</p> <p>0107: OPEN 4, NO contact, OPEN till final position is reached, with hold open time, with clearance time, both directions</p> <p>0108: OPEN 2, NO contact, till intermediate stop, with hold open time, with clearance time, both directions</p> <p>0109: OPEN 3, NO contact, till intermediate stop, with hold open time, with clearance time, both directions</p> <p>0110: OPEN 1, NO contact, OPEN till final position is reached, with hold open time, with clearance time, direction from the outside</p> <p>0111: OPEN 1, NC contact, OPEN till final position is reached, without hold open time, without clearance time, both directions</p> <p>0112: OPEN 1, NO contact, OPEN till final position is reached, without hold open time, with clearance time, both directions</p> <p>0113: OPEN-legitimation, with hold open time, with clearance time</p> <p> OPEN command will performed if detector channel 1 is active at the same time (P.660 = 7)</p> <p>0114: OPEN lockage, not lockabel, NO contact, till final position is reached intermediate stop, with hold open time, with clearance time, direction from the inside</p> <p>0116: OPEN 1, NO contact, OPEN till final position is reached, without hold open time, with clearance time, direction from the outside</p>

P.	[Unit] Range	Function	Description/ Note
			0117: OPEN 1, NO contact, OPEN till final position is reached, without hold open time, with clearance time, direction from the inside
			0120: OPEN 2, NO contact, OPEN till final position is reached, with hold open time, without clearance time, direction from the inside
			0121: OPEN 1, NO contact, OPEN till final position is reached, with hold open time, without clearance time, direction from the outside
			0124: OPEN 2, NO contact, till intermediate stop, with hold open time, with clearance time, direction from the inside
			0125: OPEN 2, NO contact, OPEN till final position is reached, with hold open time, with clearance time, direction from the inside
			0129: OPEN 2, NO contact, till intermediate stop, with hold open time, with clearance time, direction from the outside
			0152: OPEN Command wich starts additionally the emergency opening test. For this P.494 = 2 must be set.
			0165: OPEN 1 may be locked. Special functions for traffic light switching behaviour in end position OPEN (selected by P.7x9> = 5) are ignored
			0180: OPEN 5, deadman travel possible, N.O. contact, OPEN till final position is reached, with hold open time, with clearance time, direction from the inside
			0201: Pull switch, OPEN-> final position-> CLOSE->OPEN, NO contact, 1. Intermediat stop 2. Final position OPEN, with hold open time, with clearance time, both directions
			0202: Pull switch, OPEN-> final position-> CLOSE->OPEN, NO contact, 1. Intermediat stop 2. Final position OPEN, without hold open time, with clearance time, both directions
			0204: Pull switch OPEN-> final position-> CLOSE->OPEN, NO contact, OPEN till final position is reached, without hold open time, with clearance time, both directions
			0205: Pull switch, OPEN-> STOP -> CLOSE->OPEN, NO contact, Final position OPEN, without Hold open time, without clearance time, both directions
			0223: Pull switch, OPEN-> STOP -> CLOSE->OPEN, NO contact, Final position OPEN, with Hold open time, with clearance time, both directions
			0301: Permanent-OPEN, NO contact, 1. Intermediat stop 2. OPEN, without hold open time, without clearance time, both directions
			0302: Permanent-OPEN (summer mode lock), NO contact, OPEN till final position is reached, without hold open time, with clearance time, both directions
			0304: Permanent-OPEN, NO contact, OPEN till final position is reached, without hold open time, without clearance time, no direction
			0401: Stop-command, NC contact
			0402: Stop-command, NO contact

P.	[Unit] Range	Function	Description/ Note
		0403:	Stop-command acknowledgement possible, NC contact
		0404:	Stop-command acknowledgement possible, NO contact
		0407:	Crash impulse as N.O. contact
		0411:	Crash impulse as N.C. contact
		0501:	Safety B reversing when CLOSING, NC contact, final position as before, hold open time as before, with clearance time
		0502:	Safety B reversing when CLOSING, NC contact, final position as before, hold open time as before, with clearance time
		0504:	Safety B reversing when CLOSING, NC contact, final position as before, at least with hold open time, with clearance time
		0505:	Safety B reversing when CLOSING, NO contact, final position as before, hold open time as before, with clearance time
		0506:	Safety B reversing when CLOSING, NC contact, final position as before , at least with hold open time, with clearance time
		0507:	Safety B reversing when CLOSING, NO contact, final position as before, with hold open time as before, with clearance time
		0509:	Safety B with reversing when closing, with open holding time, with clearance time
		0511:	Safety input B with reversing during closing in combination with light Curtain
		0520:	Safety B: Reversing when CLOSING, NO contact, with testing in end position OPEN
		0522:	Safety input B: Reversing when OPENING, 8K2 contact, End position as before, with Clearance time
			 <i>This Function works only with inputs for 8K2 evaluation, e.g. IN10</i>
		0530:	Security B reversing during the CLOSING run, normally closed, end position as before, open holding time, as before, with evacuation time, LC message Safety.
		0601:	Manual operation for OPENING and CLOSING, NO contact
		0602:	Manual operation for CLOSING, NO contact
		0701:	CLOSE-command, NO contact, with Clearance time
		0703:	CLOSE-command which interrupts the OPENING and locks CLOSE commands, NO contact, with Clearance time
		0704:	CLOSE-command which interrupts the OPENING, reversing is possible, NO contact, with Clearance time
		0713:	CLOSE command, N.C., with clearance time
		0714:	CLOSE command which stops the opening movement, Opening is possible, N.O., with clearance time.
		0801:	Interlock in final CLOSED position, no dead man move is possible, NO contact
		0802:	Interlock in final CLOSED position, dead man move is possible, NO contact

P.	[Unit] Range	Function	Description/ Note
		0803:	Stop, followed by automatic OPENING, NO contact, wait for CLOSE-command
		0804:	Stop, followed by automatic CLOSING, NO contact
		0901:	Cross traffic, locking of OPEN 1 and detector 1 commands, NO contact
		0902:	Cross traffic, locking of OPEN 2 and detector 2 commands, NO contact
		0903:	Cross traffic, locking of OPEN 1 and OPEN 2 as well as detector 1 and detector 2 commands, NO contact
		1001:	Disable hold open time, NO contact
		1002:	Disable lockage, NO contact
		1003:	Disable intermediate stop, NO contact
		1004:	Disabled detector commands from the direction outside, NO contact
		1005:	Deactivation of detector open and close commands, the safety function of the detector remains active.
		1101:	Pre-limit switch light barrier, NO contact
		1102:	Limit switch intermediate stop, NO contact
		1103:	Pre-limit switch intermediate stop, NO contact
		1104:	Pre-limit switch safety edge, NO contact
		1105:	Pre-limit switch safety edge, NC contact
		1106:	Pre-limit switch door OPEN, NO contact
		1107:	Pre-limit switch door OPEN, NC contact
		1108:	Pre-limit switch door CLOSE, NO contact
		1109:	Pre-limit switch door CLOSE, NC contact
		1110:	Pre-limit switch door OPEN, NC contact
		1111:	Limit switch door CLOSE, NC contact
		1112:	Reference switch, NO contact
		1113:	Reference switch, NC contact
		1114:	Crash switch, NO contact
		1116:	Limit switch door CLOSE, NO contact
		1401:	Safety A, stop during CLOSING, NC contact
		1402:	Safety A, reversing when CLOSING, NC contact, final position as before, hold open time as before, with clearance time
		1403:	Safety A, stop when CLOSING after release, move continues when CLOSED, NC contact, with Clearance time
		1404:	Safety A, stop when OPENING and CLOSING, NC contact
		1405:	Safety A, stop when OPENING and CLOSING, after release, the CLOSING move continues until CLOSED, NC contact, with Clearance time
		1406:	Safety A, reversing when OPENING, NC contact, final position as before, hold open time as before, with clearance time
		1407:	Safety A, stop when OPENING, NC contact, final position as before, hold open time as before, with clearance time
		1408:	Safety A, pull-in protection, stop when OPENING, then only dead man CLOSING possible, NC contact, final position as before, auto-close time as before, without clearance time
		1418:	Safety A, stop when OPENING or CLOSING, N.C. contact

P.	[Unit] Range	Function	Description/ Note
1420:		Safety A, reversing when CLOSING, 8K2 contact, Final position as before, with clearance time	 <i>This Function works only with inputs for 8K2 evaluation, e.g. IN10</i>
1422:		Safety A, reversing when OPENING, 8K2 contact, End position as before, with clearance time	 <i>This Function works only with inputs for 8K2 evaluation, e.g. IN10</i>
1501:		Simulation foil key pad OPEN	
1502:		Simulation foil key pad CLOSE	
1506:		Simulation foil key pad STOP	
1612:		Safety C when OPENING, free ride as long as input is active, 8K2 contact, Final position OPEN, without Clearance time	 <i>This Function works only with inputs for 8K2 evaluation, e.g. IN10</i>
1613:		Safety C, reversing when CLOSING, 8K2 contact, End position as before, with Hold open time, with Clearance time	 <i>This Function works only with inputs for 8K2 evaluation, e.g. IN10</i>
1624:		Safety C, Safety during OPENING: reversing in CLOSE- direction during automatic OPENING, Stop during dead man OPENING, no reaction during CLOSING, N. C. contact, endposition as before, hold open time as before, with clearance time	
1701:		Driving to intermediate stop / partial open from each position, NO contact, with Hold open time, with Clearance time, both directions	
1801:		External detector channel 1	 <i>To adjust the detector the parameters P.66x are used</i>
1802:		External detector channel 2	 <i>To adjust the detector the parameters P.67x are used</i>
1803:		External detector channel 3	 <i>To adjust the detector the parameters P.6Cx are used</i>
1804:		External detector channel 4	 <i>To adjust the detector the parameters P.6Dx are used</i>
			 <i>The exact settings which this profile involves can be found in Chapter "Overview of Input Profiles"</i>

P.	[Unit] Range	Function	Description/ Note
P.502 --w	0000 ... 1804	Function of Input 2	see P.501
P.503 --w	0000 ... 1804	Function of Input 3	see P.501
P.504 --w	0000 ... 1804	Function of Input 4	see P.501
P.505 --w	0000 ... 1804	Function of Input 5	see P.501
P.506 --w	0000 ... 1804	Function of Input 6	see P.501
P.507 --w	0000 ... 1804	Function of Input 7	see P.501
P.508 --w	0000 ... 1804	Function of Input 8	see P.501
P.509 --w	0000 ... 1804	Function of Input 9	see P.501
P.50A --w	0000 ... 1804	Function of Input 10	see P.501
P.50B --w	0000 ... 1804	Function of Input 11	see P.501
P.50C --w	0000 ... 1804	Function of Input 12	see P.501

## 21.1 Input profiles with expansion board



The expansion board is activated by P.800



The expansion board can not be used with all controllers.

P.	[Unit] Range	Function	Description/ Note
P.A01 --w	0000 ... 1804	Function of Input 21	see P.501
P.A02 --w	0000 ... 1804	Function of Input 22	see P.501
P.A03 --w	0000 ... 1804	Function of Input 23	see P.501
P.A04 --w	0000 ... 1804	Function of Input 24	see P.501
P.A05 --w	0000 ... 1804	Function of Input 25	see P.501
P.A06 --w	0000 ... 1804	Function of Input 26	see P.501

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## 22 Input parameterizing of standard digital and radio inputs

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### 22.1 OPEN commands P.5x0 / P.Ex0 / P.Ax0 = 1

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Parameter P.5x0 / P.Ex0 / P.Ax0 must be set to 1 in order to activate the basic function OPEN command for this input.

X = number of the input you wish to configure

P.	[Unit] Range	Function	Description/ Note
P.893 -zz	0 ... 1	Executing open commands while closing	While the door is closing, open commands can be ignored and repeated when it reaches the closed position  0: An open command that is issued when closing reverses the door when it has opened (except for specially configured close commands, e.g. for barriers ) 1: An open command that is issued when closing does not reverse the door, the open command is repeated when reaching the lower final position

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## 23 Output Profiles

P.	[Unit] Range	Function	Description/ Note
P.701 --w	0000 ... 3201	Function of Output 1	<p>The function of the output relay can be specified using this profile. All parameters needed for the function of the output are changed in one step.</p> <p>0000: Output deactivated  0001: Continuously turned on  0101: Door is Open  <i> The message depends on the logical status of the door</i>  0103: Door is Open  <i> The message depends on the position of the door</i>  0201: Door is Closed  <i> The message depends on the logical status of the door</i>  0203: Door is Closed  <i> The message depends on the position of the door</i>  0401: There is no error  0501: Courtyard light function, switched ON during opening and closing with 10 s switch off delay after closing.  0601: Passing on detector channel 1  0602: Passing on detector channel 2  0605: Synchronous control OPEN, signal duration 0.5 seconds.  The output is active during opening, in End position OPEN and during locking in end open position.  0606: Synchronous control CLOSE, signal duration 0.5 seconds.  The output is active during Closing, in End position Close and during locking in end position close.  0607: Synchronous control STOP, signal duration 0.5 seconds.  The output is active when the door is not moving, no end position is approached and no locking in any end position is active.  0612: Passing on leaving detector 1  0613: Passing on leaving detector 2  0630: Forwarding Brake  0634: Forwarding, of an low Battery from the WiCab mobile Unit  0701: Flashing during opening and closing  0703: Switched on during Opening and Closing  0801: Active during opening and closing and during active pre-warning / clearance time.  1001: Locking second door  1002: Locking second door, 1 s switch off delay  1101: Magnet voltage in end position CLOSE    <b>The N.C. contact of the relay has to be used</b>  1102: Magnet voltage during Closing and in end position CLOSE</p>

P.	[Unit] Range	Function	Description/ Note
			1201: Green traffic light on inside of door
			1210: Green traffic light on outside of door
			1220: Red traffic light on inside of door 1
			1221: Flashing red traffic light on inside of door 1
			1222: Red traffic light on inside of door 2
			1223: Flashing red traffic light on inside of door 2
			1224: Red traffic light on inside of door
			1232: Red traffic light on inside
			1233: Red traffic light on inside, inverted
			1250: Red traffic light on outside of door 1, flashing during clearance time
			1251: Flashing red traffic light on outside of door 1
			1252: Red traffic light on outside of door 2
			1253: Flashing red traffic light on outside of door 2
			1255: Red traffic light on outside of door
			1263: Red traffic light on outside
			1264: Red traffic light on outside, inverted
			1295: Green traffic light, flashing during pre-warning / clearance time, ON in end position OPEN
			1298: Direction dependent red traffic light. On for opening and closing movement. Off when CLOSED and when OPEN. Flashes during evacuation time
			1601: Airlock OPEN
			1701: Testing in end position close
			1801: Counting +
			 <i>The function is only possible with detectors 1 and 2. At first you have to activate the + loop and then the - loop.</i>
			1901: Counting -
			 <i>The function is only possible with detectors 1 and 2. At first you have to activate the - loop and then the + loop.</i>
			2001: Warning light 1, always ON if door is not closed.
			2101: Warning light 2, switched ON during closing
			2201: Active green traffic light, ON in endposition OPEN until a close command is given or detector 2 gets active.
			2301: Active green traffic light, ON in endposition OPEN until a close command is given or detector 1 gets active.
			2501: Testing in endposition OPEN
			2601: Emergency opening test
			3201: Output function brake
			 <i>The exact settings which this profile involves can be found in Apendix Output Profile.</i>

P.702 --w	0000 ... 3201	Function of Output 2	see P.701 or P.704
P.703 --w	0000 ... 3201	Function of output 3	see P.701 or P.704
P.70C --w	0000 ... 3201	Function of Output 12	see P.701 or P.704
P.70D --w	0000 ... 3201	Function of Output 13	see P.701 or P.704
P.70E --w	0000 ... 3201	Function of Output 14	see P.701 or P.704

P.	[Unit] Range	Function	Description/ Note
P.70F --w	0000 ... 3201	Function of output 15	see P.701 or P.704
P.D0A -ww	0000 ... 3201	Function of output 2A	see P.701 or P.704

### 23.1 Door profiles with expansion card

P.	[Unit] Range	Function	Description/ Note
P.705 --w	0000 ... 3201	Function of Output 5	see P.701 or P.704
P.706 --w	0000 ... 3201	Function of Output 6	see P.701 or P.704
P.707 --w	0000 ... 3201	Function of Output 7	see P.701 or P.704
P.708 --w	0000 ... 3201	Function of Output 8	see P.701 or P.704
P.709 --w	0000 ... 3201	Function of Output 9	see P.701 or P.704
P.70A --w	0000 ... 3201	Function of Output 10	See P.701 or P.704
P.70B --w	0000 ... 3201	Function of Output 11	see P.701 or P.704

## 24 Command forwarding

The command forwarding function is activated with P.7x0 / P.Dx0 / P.Ex0 = 6.

P.	[Unit] Range	Function	Description/ Note
P.899 -ww	[%] 1 ... 100	Incidence of random activation	Indicates the frequency of the accidental triggering of a correspondingly set output (P.7xF = 83), while closing, as a percentage.

## 25 Airlock function

An airlock consists of two doors. These are locked against each other so that only one door can be opened at same time. In addition, after the first door has been closed, an OPEN command is sent to the second gate via an interface. This means that OPEN command switches can be saved inside the airlock.

An OPEN command is issued at the first door. The input of the OPEN command must have the direction "from outside". When the airlock function is activated, the airlock operation is initiated.

The first door opens, the hold-open time expires and the door closes again. While the door is opened, the second door is locked in the end position door CLOSED.

The locking of the second door can optionally be canceled by pressing the stop button on the locked door in order to deliberately deactivate the airlock for one operation.

After reaching the end position door CLOSED, the interlock of the second door is released again and, in addition, an OPEN command is issued to the second door.

Optionally, it is also possible to activate a drive through detection by means of a light barrier. If no vehicle enters the airlock, the process is interrupted.

This door will now be opened and closed again. The airlock operation is now complete.

If the second door can not open, e.g. by an actuated EMERGENCY STOP, the first door re-opens to allow the person or vehicle inside the airlock to exit the airlock.

P.	[Unit] Range	Function	Description/ Note
A.830	0000 ... 0301	Airlock mode	This parameter specifies the mode of the airlock system.  0000: Airlock deactivated 0200: Comfortable Airlock Slave, Commands will be forwarded. 0201: Comfortable Airlock Master 0300: Comfortable Airlock with drive thru recognition by photo eye, Slave 0301: Comfortable Airlock with drive thru recognition by photo eye, Master

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## 26 Diagnostics display

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P.	[Unit] Range	Function	Description/ Note
P.910 -ww	0 ... 41	Display mode selection	With the aid of this parameter you can show the variables listed below in the display of the door controller.

The following variables are displayed

- 0: The control sequence is displayed (Automatic)
  - 1: [Hz] The current travel speed
  - 2: [A] The current motor current
  - 3: [V] The current motor voltage
  - 4: [A] The current DC-Bus current
  - 5: [V] The current DC-Bus voltage
  - 6: [°C] The power stage temperature in °Celsius
  - 7: [°F] The power stage temperature in °Fahrenheit
  - 8: [s] The run-time of the motor during the last door operation
  - 9: [Increments] The current position
  - 10: [Increments] The position of the reference
  - 11: [Dig] Channel 1 value of the absolute encoder
  - 12: [Dig] Channel 2 value of the absolute encoder
  - 13: [V] Current reference voltage
  - 14: [°C] Temperature inside the housing in °Celsius
  - 15: [°C] Temperature inside the housing in °Fahrenheit
  - 16: Transmission ratio from motor to encoder during opening
  - 17: Transmission ratio from motor to encoder during closing
  - 21: Number of position requisition without answers from encoder
  - 22: Number of wrong received signs in TST PD encoder  
(activates also the output in P.955)
  - 23: Radio quality of the wireless safety device in %.
  - 24: Number of errors of the wireless safety device during the last door drive.
  - 25: Time of the real time clock module
  - 29: Address of the partner controller (only in Master mode sensefull)
  - 30: Shows the energy of the brake chopper in Joule
  - 32: Displays the current of the mechanical brake
  - 34: Display number of connected supply phases;  
0: No detection (recognition of the connected supply phases is only possible with a larger intermediate circuit)
  - 37: Temperature difference between brake resistor and environment
  - 39: Shows the current cos phi
  - 40: Display of the momentary DC bus current in percent of maximum continuously permissible DC bus current.
  - 41: Display of the load of the motor protection switch in per cent
-

## 27 Error Memory

P.	[Unit] Range	Function	Description/ Note
P.920 rww		Error Memory	<p>The controller stores the last eight errors in the error memory.</p> <p>After opening Parameter P.920:</p> <ul style="list-style-type: none"> <li>- Change level using OPEN and CLOSE keys</li> <li>- Opening the error memory with the STOP key</li> <li>- Closing the error memory with the STOP key</li> <li>- Exiting Parameter P.920 with Eb -</li> </ul> <p>Eb1: Error message 1 (most recent error)            Eb2: Error message 2            Eb3: Error message 3            Eb4: Error message 4            Eb5: Error message 5            Eb6: Error message 6            Eb7: Error message 7            Eb8: Error message 8            Ebcl: Clear the complete error memory            Eb-: Exit, jump back to P.920</p> <p> <i>Er- in the display means that no error was entered.</i></p>

## 28 Software Version

P.	[Unit] Range	Function	Description/ Note
P.925 rrr		Software Version	This parameter displays the version of the currently used software.
P.926 rrr		Software version of additional board	This parameter shows the current used software version of the additional board.
P.927 -rr		Serial number	Display of serial number. The serial number can be set on highest password level. As long no serial number is set "Not Set" is displayed
P.928 rrr		Software Version of I/O Processor	This parameter displays the version of the currently used software of the I/O Processor.

## 29 Door run-Time

P.	[Unit] Range	Function	Description/ Note
P.930 -rr	[Seconds]	Motor run-time	In this parameter the time required for the last drive operation is stored.

## 30 Testing of emergency opening

This function is used to make sure that the emergency opening is working. For that the time that the door needs for a full opening, is measured. If it takes too long, the error message F.021 appears and a user intervention is necessary.

The testing happens every time from endposition close, under the following conditions:

1. After power on with the first message door is close.
2. After the door cycles set in P.492, after power on or after the last testing.
3. After the time set in P.493, after power on or after the last testing.

P.	[Unit] Range	Function	Description/ Note
A.490	0 ... 1	Application emergency opening test	With this application the checking of the emergency opening test is set.  0: Deactivation emergency opening test 1: Mechanical emergency opening test
P.040 www	0 ... 1	Activation of the emergency opening test	This parameter specifies if the emergency opening test is activated or deactivated.  0: Emergency opening test deactivated 1: Emergency opening test activated

 *This parameter is only available in the highest password level.*

## 31 Input Voltage Measurement

P.	[Unit] Range	Function	Description/ Note
P.940 -rr	[Volt]	Input voltage	In this parameter the amount of the currently present input voltage is displayed.

## 32 Activation of the Expansion Board

P.	[Unit] Range	Function	Description/ Note
P.800 -ww	0 ... 5	Activate Expansion board	The expansion board is activated with this parameter.  0: Board deactivated 5: TST RFUxK
P.802 -ww	0000 ... 0302	Function of the expansion slot	This parameter defines the hardware that was inserted into the expansion slot.  0000: Expansion slot deactivated 0101: TST SURA1 activated 0106: TST SURA6 activated 0202: Radio module activated 0302: Detector activated
P.803 -ww	0000 ... 0302	Function of the expansion slot	This parameter defines the hardware that was inserted into the expansion slot.  0000: Expansion slot deactivated 0302: Detector module activated
P.80A -ww	0 ... 1	Activation of CAN termination	With this Parameter the resistor of the CAN termination could be switched.  0: CAN termination resistor deactivated. 1: CAN termination resistor active.

### 33 Operating Mode of the Controller

P.	[Unit] Range	Function	Description/ Note
P.980 -ww	0 ... 4	Operating mode	This parameter is used to set the operating mode for the controller.

The following modes are possible:

- 0: OPEN and CLOSE move in self-holding (Automatic)
- 1: OPEN move in self-holding, CLOSE move in manual mode (partial automatic)
- 2: OPEN and CLOSE move in Manual mode (deadman)
- 3: Deadman emergency operation

**⚠ ATTENTION**

**All safety devices and limit switches are ignored.**

- i** After turning off the controller, the controller changes in the operating mode "deadman"
- 4: Endurance test with safety devices  
Automatic OPEN and CLOSE operation. Before each new operation the hold-open time P.010 is in effect.  
**i** After turning off the controller, these changes in the operating mode "deadman"  
**i** The endurance test setting is lost after turning off the controller. The controller then reverts to manual mode.

### 34 Display Text Language

P.	[Unit] Range	Function	Description/ Note
P.984 -ww	0 ... 1	Screensaver	Scrolling text specifically for use with OLED displays to protect against premature aging of individual pixels.  0: Deactivated 1: Activated

## 35 Password

 *The password is not settable on the customer level*

P.	[Unit] Range	Function	Description/ Note
P.999 www	0000 ... FFFF	Password	The password provides access to the various parameter levels.
			 <p>There are different parameters visible depending on the password level. A changing of parameters without to know there functionality is forbidden. In order to avoid failure and endangering because of unauthorized access passwords are only allowed to give to trained staff.</p>

## 36 Factory Setting / Defaults

P.	[Unit] Range	Function	Description/ Note
P.990 -ZZ	0 ... 3	Factory setting	<p>By setting and saving this parameter all parameter values are restored.</p> <ol style="list-style-type: none"> <li>1: Load parameter set, which are adjusted ex works</li> <li>2: Loads parameter set, which was stored before with P.997 = 2, from the internal storage.</li> </ol> <p> <i>After a software update the stored parameter set should not fit to the new program strukture.</i></p> <ol style="list-style-type: none"> <li>3: Load the second duplicated parameter set that was previously saved with P.997 = 3 from internal memory.</li> </ol> <p> <i>After a software update the stored parameter set should not fit to the new program strukture.</i></p>
P.997 -ww	0 ... 3	Storage of actual parameter settings	<p>The actual parameter settings are stored in the internal storage.</p> <ol style="list-style-type: none"> <li>0: The current parameter set is not saved.</li> <li>2: The current parameter set is saved and can be loaded via P990 = 2 again.</li> <li>3: The current parameter set is saved and can again be loaded via P 990 = 3</li> </ol>

## 37 Softwareupdate

There are two different ways to make software update:

1. A USB stick with an update file in the root directory (only one File on the stick is allowed) is plugged in and than the controller has to switched on. During switching on the stop key has to be pressed. The current software version is shown. After releasing the stop key the software update can start by pressing the UP arrow key.
2. By the help of Parameter P.989 a software version is choosen.

P.	[Unit] Range	Function	Description/ Note
P.989 -ww	0 ... 65535	Start software update	With this Parameter a File is chosen from the USB stick which will programmed to the controller  By opening the Parameter with the Stop key all Update Files which are stored in the root directory of the USB stick are shown resp. it can be scrolled thru with the arrow keys. By pressing the stop key for a long time the Update is started with the chosen File.

## 38 USB Parameter files

This function can be used to copy Parameter files from door to door, to create a backup file of current Parameter setup, to create a complete Parameter file in order to send it to the door manufacturer or to copy the visible parameters.

P.	[Unit] Range	Function	Description/ Note
P.943 zww	0 ... 4	Storage of Parameter file	The purpose of the parameter file to store is set by the help of this parameter.  <ul style="list-style-type: none"> <li>0: No Parameter file choosen</li> <li>1: Writes the parameter to a Parameter file which can be used to load to another controller. An existing file will be overwritten.</li> <li>2: Writes parameter to a Parameter file as backup for this controller. An existing file will be overwritten</li> <li>3: Parameter file for forwarding settings to the door manufacturer (All Parameters are included). A new file with a not existing file name will be added.</li> <li>4: Store Parameter file unencrypted. Only the visible parameters will be stored. A new file with a not existing file name will be added.</li> </ul>
P.944 zww		Load Parameter file	By the help of this parameter the parameter file to loas is choosen  <ul style="list-style-type: none"> <li>0: No Parameter file selected</li> <li>1: Load a Parameter file which is on the stick to copy parameters to another controller</li> <li>2: Load the for this controller stored backup file</li> <li>3: Load Parameter file with number nnnn from the root directory of the USB stick</li> </ul>

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## 39 Digital timer

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### 39.1 Real time clock

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P.	[Unit] Range	Function	Description/ Note
P.C00 rrr		The current time and date is shown.	The current time and date of the clock device is shown. This parameter is "read only". The shown text can be scrolled by pressing the OPEN or CLOSE key.

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## 40 Breakaway-function

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In case of an tripped breakaway input the breakaway counter will count up by 1.  
 In case of breakaway only dead man move is possible. The breakaway error must be resetet manually.

P.	[Unit] Range	Function	Description/ Note
P.871 rrr		Breakaway counter	This parameter shows the number of counted crashes.

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## 41 Parameter Summary

P.	Function	Default	Changed of: at:	Page
A.480	Application	0		23
A.490	Application emergency opening test	0		48
A.830	Airlock mode	0000		45
A.F00	FSx Wireless safety system profile	0000		25
P.000	cycle counter	[Cycles]		5
P.005	Maintenance counter	[Cycles]		5
P.010	Auto close time 1	10 [Seconds]		5
P.011	Auto close time 2	10 [Seconds]		5
P.012	Forced closing time	0 [Seconds]		6
P.025	Pre-warning time before closing	0 [Seconds]		6
P.026	Pre-warning time before closing from between the end positions	0		6
P.040	Activation of the emergency opening test	0		48
P.100	Motor rated frequency	[Hz]		7
P.101	Motor rated current	[A]		7
P.102	Power factor cos Phi	[%]		7
P.103	Motor rated voltage	[Volt]		7
P.110	Drive profile	0		8
P.115	Motor current regulator	2,5		8
P.116	DC bus current limiter	100 [%]		8
P.117	cos phi Regulator (Eco Modus)	1		8
P.130	Motor rotary field	0		8
P.140	Boost for OPEN	0 [%]		9
P.142	IxR compensation for OPEN	0 [Hz]		10
P.143	Voltage reduction for OPEN	100 [%]		10
P.145	Boost for CLOSE	0 [%]		9
P.147	IxR compensation for CLOSE	0 [Hz]		10
P.148	Voltage reduction for CLOSE	100 [%]		11
P.183	Working current of the mechanical brake	0,0 [A]		11
P.202	Transmission ratio			11
P.205	Selecting the positioning system profile			11
P.210	New teaching of the end positions	5		12
P.215	Requesting correction of the pre-limit switch and limit switch bands	0		12
P.216	Activating auto correction / Selecting the ramp setting mode	4		13
P.217	Tolerance of automatic end switch correction	20		13
P.221	Correction value End position door CLOSE	0 [Increments]		14
P.222	Pre-limit switch position Door CLOSE	400 [Increments]		15
P.231	Correction value End position Door OPEN	0 [Increments]		17
P.232	Pre-limit switch position Door OPEN	500 [Increments]		19
P.259	Counting direction incremental encoder	1		22
P.25F	Synchronization type profile			22
P.310	Travel frequency for rapid OPEN	60 [Hz]		18
P.311	Duration of start ramp "r1"	60 [10 ms]		18
P.312	Acceleration of start ramp "r1"	100 [Hz/s]		18
P.320	Creep speed frequency for OPEN	20 [Hz]		19
P.321	Duration of brake ramp "r2"	50 [10 ms]		20

P.	Function	Default	Changed of: at:	Page
P.322	Acceleration of brake ramp "r2"	80 [Hz/s]		20
P.340	Duration of stop ramp "r STOP-A" after stop is triggered	75 [10 ms]		21
P.342	Acceleration of stop ramp " r STOP-A" after stop is triggered	150 [Hz/s]		21
P.350	Travel frequency for rapid CLOSE	40 [Hz]		14
P.351	Duration of start ramp "r5"	50 [10 ms]		14
P.352	Acceleration of start ramp "r5"	80 [Hz/s]		15
P.360	Creep speed frequency for CLOSE	20 [Hz]		16
P.361	Duration of brake ramp "r6"	50 [10 ms]		16
P.362	Acceleration of brake ramp "r6"	40 [Hz/s]		16
P.382	Acceleration of stop ramp "r STOP-Z" after stop is triggered	150 [Hz/s]		17
P.44A	Range	4,0 [m]		23
P.460	profile internal safety edge	6		34
P.466	External testing of safety edge	0		34
P.501	Function of Input 1	0101		35
P.502	Function of Input 2	0401		40
P.503	Function of Input 3	0701		40
P.504	Function of Input 4	0201		40
P.505	Function of Input 5	0501		40
P.506	Function of Input 6			40
P.507	Function of Input 7			40
P.508	Function of Input 8			40
P.509	Function of Input 9			40
P.50A	Function of Input 10	1001		40
P.50B	Function of Input 11	0106		40
P.50C	Function of Input 12	0110		40
P.701	Function of Output 1	0101		41
P.702	Function of Output 2	0201		41
P.703	Function of output 3	3201		41
P.705	Function of Output 5	1220		41
P.706	Function of Output 6	1201		41
P.707	Function of Output 7	1250		41
P.708	Function of Output 8	1210		41
P.709	Function of Output 9	0000		41
P.70A	Function of Output 10	0000		41
P.70B	Function of Output 11	0001		41
P.70C	Function of Output 12	0000		41
P.70D	Function of Output 13	0000		41
P.70E	Function of Output 14	0000		41
P.70F	Function of output 15	0001		41
P.800	Activate Expansion board	0		49
P.802	Function of the expansion slot	0202		49
P.803	Function of the expansion slot	0302		49
P.80A	Activation of CAN termination	1		49
P.871	Breakaway counter			53
P.892	Oncomming traffic control	1		6
P.893	Executing open commands while closing	0		41
P.899	Incidence of random activation	50 [%]		44
P.8BA	Specialization of a safety function A to E in operating mode 7	0		23
P.910	Display mode selection	0		46
P.920	Error Memory	0		47
P.925	Software Version			47
P.926	Software version of additional board			47

P.	Function	Default	Changed of: at:	Page
P.927	Serial number	0000000000		47
P.928	Software Version of I/O Processor			47
P.92A	Softwareversion FSx mobile unit			24
P.92B	Software version FSx stationary unit			24
P.930	Motor run-time	[Seconds]		48
P.931	Software version transmitter			23
P.932	Software version receiver			23
P.933	Serial number transmitter			23
P.934	Serial number receiver			23
P.935	Error bit transmitter	[Digits]		23
P.936	Error bit receiver	[Digits]		23
P.937	Aligning mode	0		23
P.938	Light line quality			24
P.93C	Error counter RS485	0		24
P.940	Input voltage	[Volt]		48
P.943	Storage of Parameter file	0		52
P.944	Load Parameter file	0		52
P.973	Resetting the maintenance counter	0		5
P.980	Operating mode			50
P.984	Screensaver	0		50
P.989	Start software update	0		52
P.990	Factory setting	0		51
P.997	Storage of actual parameter settings	0		51
P.999	Password	0000		51
P.9F0	Capacity of battery	0 [%]		24
P.9F1	Battery voltage of radio safety system	[Volt]		24
P.9F2	Wireless status	[%]		24
P.A01	Function of Input 21	0104		40
P.A02	Function of Input 22	0901		40
P.A03	Function of Input 23	0502		40
P.A04	Function of Input 24	0107		40
P.A05	Function of Input 25	0109		40
P.A06	Function of Input 26	1002		40
P.C00	The current time and date is shown.			53
P.D0A	Function of output 2A	0000		44
P.F00	Activation of the wireless	0		24
P.F01	Timeout for the wireless	50 [ms]		24
P.F05	Channelgroup	1		24
P.F07	Address of the mobile unit	00000000		25
P.F09	Battery nominal voltage	3,6 [Volt]		25
P.F10	Mode input 1	0		27
P.F11	Safety	2		27
P.F12	Contact type of the input	0		27
P.F13	Debouncing time	1		28
P.F16	Output	1		28
P.F17	Direction 1	0		28
P.F18	Handshake	0		28
P.F19	LCD Messages	0		28
P.F1F	Function input 1	0000		26
P.F20	Mode input 2	0		29
P.F21	Safety	2		29
P.F22	Contact type of the input	0		29
P.F23	Debouncing Time	1		29
P.F26	Output	1		29
P.F27	Direction 2	0		29

P.	Function	Default	Changed of: at:	Page
P.F28	Handshake	0		30
P.F29	LCD Messages	0		30
P.F2F	Function input 2	0000		26
P.F30	Mode input 3	0		30
P.F31	Safety	2		30
P.F32	Contact type of the input	0		30
P.F33	Debouncing time	1		31
P.F36	Output	1		31
P.F37	Direction 3	0		31
P.F38	Handshake	0		31
P.F39	LCD Messages	0		31
P.F3F	Function input 3	0000		26
P.F40	Mode input 4	0		32
P.F41	Safety	2		32
P.F42	Contact type of the input	0		32
P.F43	Debouncing time	1		32
P.F46	Output	1		32
P.F47	Direction 4	0		32
P.F48	Handshake	0		33
P.F49	LCD Messages	0		33
P.F4F	Function input 4	0000		27
P.FA9	LCD- Messages	0		33
P.FB9	LCD Messages	0		33
P.FC9	LCD Messages	0		33
P.FF2	Mode output 2	0		25

## 1 LCD-Messages

For each input of the controller a text message can be set, that appears on the LCD display when the input is triggered.

For the following inputs, the LCD message can be changed from the standard LCD text to an optional LCD message:

### 1.1 LCD text

Input	Parameter	LCD Message		Other languages				
		Text	Terminal	German	Spanish	French	Dutch	Italian
Input 1	P.519	Input 1	T52	Eingang 1	Entrada 1	Entree 1	Ingang 1	entrata 1
Input 2	P.529	Input 2	T53	Eingang 2	Entrada 2	Entree 2	Ingang 2	entrata 2
Input 3	P.539	Input 3	T54	Eingang 3	Entrada 3	Entree 3	Ingang 3	entrata 3
Input 4	P.549	Input 4	T72	Eingang 4	Entrada 4	Entree 4	Ingang 4	entrata 4
Input 5	P.559	Input 5	T75	Eingang 5	Entrada 5	Entree 5	Ingang 5	entrata 5
Input 6	P.569	Input 6	T82	Eingang 6	Entrada 6	Entree 6	Ingang 6	entrata 6
Input 7	P.579	Input 7	T85	Eingang 7	Entrada 7	Entree 7	Ingang 7	entrata 7
Input 8	P.589	Input 8	T61	Eingang 8	Entrada 8	Entree 8	Ingang 8	entrata 8
Input 9	P.599	Input 9	T64	Eingang 9	Entrada 9	Entree 9	Ingang 9	entrata 9
Input 10	P.5A9	Input 10	T65	Eingang 10	Entrada 10	Entree 10	Ingang 10	entrata 10
Input 11	P.5B9	Input 11	T92 or Virtual	Eingang 11	Entrada 11	Entree 11	Ingang 11	entrata 11
Input 12	P.5C9	Input 12	T93 or Virtual	Eingang 12	Entrada 12	Entree 12	Ingang 12	entrata 12
Input 13	P.5D9	Input 13	Virtual	Eingang 13	Entrada 13	Entree 13	Ingang 13	entrata 13
Input 14	P.5E9	Input 14	Virtual	Eingang 14	Entrada 14	Entree 14	Ingang 14	entrata 14
Input 15	P.5F9	Input 15	Virtual	Eingang 15	Entrada 15	Entree 15	Ingang 15	entrata 15
Input 21	P.A19	Input 21	T331	Eingang 21	Entrada 21	Entree 21	Ingang 21	entrata 21
Input 22	P.A29	Input 22	T334	Eingang 22	Entrada 22	Entree 22	Ingang 22	entrata 22
Input 23	P.A39	Input 23	T341	Eingang 23	Entrada 23	Entree 23	Ingang 23	entrata 23

Input	Parameter	LCD Message		Other languages				
		Text	Terminal	German	Spanish	French	Dutch	Italian
Input 24	P.A49	Input 24	T361	Eingang 24	Entrada 24	Entree 24	Ingang 24	entrata 24
Input 25	P.A59	Input 25	T362	Eingang 25	Entrada 25	Entree 25	Ingang 25	entrata 25
Input 26	P.A69	Input 26	T363	Eingang 26	Entrada 26	Entree 26	Ingang 26	entrata 26
Input 27	P.A79	Input 27	Virtual	Eingang 27	Entrada 27	Entree 27	Ingang 27	entrata 27
Input 28	P.A89	Input 28	Virtual	Eingang 28	Entrada 28	Entree 28	Ingang 28	entrata 28
Input 3A	P.EA9	Input 3A	Virtual	Eingang 3A	Entrada 3A	Entree 3A	Ingang 3A	entrata 3A
Input 3B	P.EB9	Input 3B	Virtual	Eingang 3B	Entrada 3B	Entree 3B	Ingang 3B	entrata 3B
Input 3C	P.EC9	Input 3C	Virtual	Eingang 3C	Entrada 3C	Entree 3C	Ingang 3C	entrata 3C
Input 3D	P.ED9	Input 3D	Virtual	Eingang 3D	Entrada 3D	Entree 3D	Ingang 3D	entrata 3D
Input 3E	P.EE9	Input 3E	Virtual	Eingang 3E	Entrada 3E	Entree 3E	Ingang 3E	entrata 3E
Input 3F	P.ED9	Input 3F	Virtual	Eingang 3F	Entrada 3F	Entree 3F	Ingang 3F	entrata 3F
Internal safety edge:	P.469	Edge Tripped	T43	Leiste Ausl.	Barra Infer	Barre inf.	Sluit.int/ex	costola sico
External safety edge:	P.479	Edge Trouble	SE1	Leiste Ausl.	Barra Dist.	Barre Defaut	ExtKKL stor.	c.ext.difett
Internal emergency stop	P.610	E-Stop Int	T28	Notaus int.	Alto-E Int	Arr.urg int.	Nooduit.int	emerg.intern
External emergency stop 1:	P.611	E-Stop Ext 1	T42	Notaus ext.1	Alto-E Ext 1	Arr.urg.ext.1	Nooduit.ext1	emerg.ext 1
External emergency stop 2:	P.612	E-Stop Ext 2	T32	Notaus ext.2	Alto-E Ext 2	Arr.urg.ext.2	Nooduit.ext2	emerg.ext 2
OPEN - Keypad:	P.639	Open-Keypad	\x01	Folie Auf	Abrir-Tecla	Clavier ouv.	Tipt.op	foglia apre
STOP - Keypad:	P.649	Stop-Keypad	\x02	Folie Stop	Parar-Tecla	ClavierStop	Tipt.stop	foglia stop
Close - Keypad:	P.659	Close-Keypad	\x08	Folie Zu	Cerrar-Tecla	ClavierFerm.	Tipt.neer	foglia chiud
Detector 1:	P.669	Loop Ch1	IL1	Schleife 1	Lazo Canal 1	Boucle 1	Lus 1	spira 1
Detector 2:	P.679	Loop Ch2	IL2	Schleife 2	Lazo Canal 2	Boucle 2	Lus 2	spira 2
Detector 3:	P.6C9	Loop Ch3	IL3	Schleife 3	Lazo Canal 3	Boucle 3	Lus 3	spira 3
Detector 4:	P.6D9	Loop Ch4	IL4	Schleife 4	Lazo Canal 4	Boucle 4	Lus 4	spira 4
Radio 1:	P.689	Radio Ch1	RA1	Funkkanal 1	RadioCanal 1	Canal radio 1	Ontv.Kanaal 1	radiocanal 1
Radio 2:	P.699	Radio Ch2	RA2	Funkkanal 2	RadioCanal 2	Canal radio 2	Ontv.Kanaal 1	radiocanal 2
WiCAB Input 1 mobile unit:	P.F19	Air Safety In	f01	FunkSichEing.	Air Safety In	Air Safety In	Air Safety In	Air Safety In

Input	Parameter	LCD Message		Other languages				
		Text	Terminal	German	Spanish	French	Dutch	Italian
WiCAB Input 2 mobile unit:	P.F29	Air Safety In	f02	FunkSichEing.	Air Safety In	Air Safety In	Air Safety In	Air Safety In
WiCAB Input 3 mobile unit:	P.F39	Air Safety In	f03	FunkSichEing.	Air Safety In	Air Safety In	Air Safety In	Air Safety In
WiCAB Input 4 mobile unit:	P.F49	Air Safety In	f04	FunkSichEing.	Air Safety In	Air Safety In	Air Safety In	Air Safety In
WiCAB Input 1 stationary unit:	P.FA9	StatSafety In	f0A	StatSichEing.	StatSafety In	StatSafety In	StatSafety In	StatSafety In
WiCAB Input 2 stationary unit:	P.FB9	StatSafety In	f0B	StatSichEing.	StatSafety In	StatSafety In	StatSafety In	StatSafety In
WiCAB Input 3 stationary unit:	P.FC9	StatSafety In	f0C	StatSichEing.	StatSafety In	StatSafety In	StatSafety In	StatSafety In

## 1.2 Selectable LCD text messages:

No.	Description	English	German	French	Spanish
1	Open	Open	Auf	Ouvert	Abrir
2	Open outside	Open extern	Auf extern	Ouvert extern	Abrir externa
3	Open inside	Open intern	Auf intern	Ouvert intern	Abrir interna
4	Single channel	Pull Switch	Einkanal	Sequentiel	Un Canal
5	Permanent open	Perm. Open	Dauerauf	Ouv Perm	Perm. Abierto
6	Stop	Stop	Stopp	Stop	Parar
7	Light beam	Photoeye	Lichtschranke	Cellule	Barrera Luz
8	Dead man mode	Deadman	Totmann	Hommort	Hombre M.
9	Close	Close	Zu	Ferm.	Cerrar
10	Locked close	Locked Closed	Verrieg. EU	VerrPosBas	Cerrado bloq.
11	Cross traffic	Cross Traffic	Querverkehr	Trafic trans.	Trafic.trans
12	Deactivation	Deactivation	Abschaltung	Deactivation	Desactivacion
13	Limit switch	Limit Switch	Endschalter	FdC	Lim.F.Carrera
14	Radar	Radar	Radardetektor	Detect radar	Radar
15	OBID-Card	OBID Card	OBID-Karte	Carte OBID	OBID Tarjeta
16	Emergency stop - thermo switch	E-Stop Ext 1	Thermo-Pille	Sonde T° Mot	Alto-E Ext 1
17	Emergency stop - slackrope switch	E-Stop Ext 2	Schlaffseil	MouCab	Alto-E Ext 2
18	Key switch	Keyswitch	Schlüsselsch.	Int a clef	Inter.d.llave

19	Pre limit switch light beam	PreLimitPhoto	VorendLi-schr	FdCDesacCell	Prelimit.Foto
20	Pre limit switch safety edge	PreLimit Edge	Vorend SiLei	FdCDesacLdS	Prelim.Banda
21	Pre limit switch open	PreLimit Open	Vorend Oben	2FdCHaut	Prelimit.sup
22	Pre limit switch intermediate stop	PreLimIntern.	VorendZw.halt	FdCPart	Prelim.inter.
23	Pre limit switch close	PreLimitClose	Vorend Unten	2FdCBas	Prelimit.Cr.
24	Limit switch open	Limit Open	Endsch. Oben	FdCHaut	Limite Abier.
25	Limit switch intermediate stop	LimitIntermed	EndschZw.halt	FdCPart	Limite.Inter.
26	Limit switch close	Limit Close	Endsch. Unten	FdCBas	Limite Cerr.
27	Reference switch	Reference	Referenz	PointDeRef.	Referencia
28	Locking in intermediate stop 2	Locked Interm	Verrieg. E2	Verr.E2	Locked Interm
30	Locking close speed	Locked Cspeed	Verrieg. Cs	VerrVitFerm	Cerrado bloq.
31	Feed rentention	Feed Retent.	Einzugsich.	Feed Retent.	Feed Retent.
32	Pull switch inside	Pull Swit.int	Eink. innen	Un canal int	Un Canal int
33	Pull switch outside	Pull Swit.ext	Eink. extern	Un canal ext	Un Canal ext
36	Crash	Crash	Crash	Crash	Crash
44	Obstacle detection	Obstacle	Hindernis	Obstacle	Obstacle
49	Personnel door switch	Escape door	Schlupftür	Portillon	Deslizamiento
50	Autoclose off	AutoClose Off	Zeitschl. aus	Temp.Ouv.Des.	Apagad.autom.
51	Emergency stop - Slack rope switch	E-Stop Ext	Schlauffseil	MouCab	Alto-E Ext
52	Safety Edge	Edge Tripped	Leiste Ausl.	LdS	Barra Infer
53	Emergency crank	Emerg.Crank	Not-Handbed.	Deverrou.	Maniv.Emerg
54	Thermo switch	Thermo Switch	Thermopille	Sonde T° Mot	Int.Termico
56	Deactivation intermediate stop	PartialOpnOff	Zwischenh.Aus	Ouv.Part.Des.	AperParclOff
58	E-Locked	Stop E-Lock	Stop E-Verr.	Verr-E.Stop	Stop E-Bloq
59	Light curtain danger zone	Safety	Sicherheit	Securite	Safety
60	Light curtain occupied	Object	Hindernis	Opstacle	Object

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**Parameter A.480**


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<b>A.480</b>	<b>Unit</b>	<b>0</b>	<b>1</b>
P.201	-	NS	1
P.210	-	NS	5
P.218	-	NS	1
P.253	-	NS	2
P.270	-	NS	3
P.271	-	NS	0
P.275	[Increments]	NS	0
P.372	[Hz/s]	NS	400
P.374	[Hz/s]	NS	80
P.433	-	0	5
P.447	-	NS	46
P.448	-	NS	5
P.449	-	NS	0
P.44A	[m]	NS	ZW
P.460	-	NS	1
P.461	-	NS	0
P.469	-	NS	59
P.46F	-	NS	1
P.4A0	-	NS	NS
P.4A1	-	NS	NS
P.4A4	-	NS	NS
P.4A8	-	NS	NS
P.4B0	-	NS	0
P.4B1	-	NS	0
P.4B4	-	NS	0
P.4B8	-	NS	0
P.4D1	-	NS	3
P.4D6	-	NS	1
P.4D9	-	NS	0
P.505	-	NS	0530

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**Parameter A.490**

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<b>A.490</b>	<b>Unit</b>	<b>0</b>	<b>1</b>
P.040	-	0	1
P.490	[Seconds]	NS	10,0
P.491	[minutes]	NS	0
P.492	[Cycles]	NS	1000
P.493	-	NS	24
P.495	[Increments]	NS	9999
P.499	-	0	2
P.506	-	NS	0101
P.507	-	NS	0601
P.56A	-	NS	1
P.57A	-	NS	1
P.701	-	NS	2601
P.702	-	NS	NS

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**Parameter A.830**

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<b>A.830</b>	<b>Unit</b>	<b>0000</b>	<b>0200</b>	<b>0201</b>	<b>0300</b>	<b>0301</b>
P.017	[Seconds]	NS	60	60	60	60
P.030	[Seconds]	NS	NS	NS	NS	NS
P.501	-	NS	0104	0104	0104	0104
P.505	-	NS	NS	NS	0501	0501
P.506	-	NS	1002	1002	1002	1002
P.50D	-	NS	0114	0114	0114	0114
P.50E	-	NS	0801	0801	0801	0801
P.5DB	-	NS	NS	3	NS	3
P.5DC	-	NS	NS	21	NS	21
P.5EB	-	NS	NS	3	NS	3
P.5EC	-	NS	NS	22	NS	22
P.830	-	0	1	1	2	2
P.831	-	NS	1	1	1	1
P.83E	-	NS	0	1	0	1
P.8D1	-	NS	NS	13	NS	13
P.8D2	-	NS	NS	14	NS	14
P.D01	-	NS	1601	1601	1601	1601
P.D02	-	NS	1001	1001	1001	1001

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**Parameter A.F00**


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A.F00	Unit	0000	10BB	20AA	20BA	20BB	21AA	21BA	21BB
P.200	-	NS	8	8	8	8	8	8	8
P.460	-	NS	1	1	1	1	1	1	1
P.465	-	0	1	1	1	1	1	1	1
P.47B	-	0	0	0	0	0	0	0	0
P.4FB	-	0	0	0	0	0	0	0	0
P.509	-	NS	NS	NS	NS	NS	0411	0411	0411
P.51F	-	0	NS						
P.58F	-	0	NS						
P.59F	-	0	NS	NS	NS	NS	2	2	2
P.5AF	-	0	NS						
P.601	-	0	NS						
P.602	-	0	3	NS	3	3	NS	3	3
P.F00	-	0	1	1	1	1	1	1	1
P.F07	-	NS	00000	00000	00000	00000	00000	00000	00000
			000	000	000	000	000	000	000
P.F1F	-	0000	F203	0000	0000	0000	F301	F301	F301
P.F2F	-	0000	0000	0000	0000	0000	0000	0000	0000
P.F3F	-	0000	F102						
P.F4F	-	0000	F203	0000	0000	0000	0000	0000	0000
P.FA9	-	NS	16	NS	16	16	NS	16	16
P.FB9	-	NS	53	NS	53	53	NS	53	53
P.FC9	-	NS	0	0	0	0	0	0	0

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**Parameter P.110**

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<b>P.110</b>	<b>Unit</b>	<b>0</b>
P.100	[Hz]	ZW
P.101	[A]	ZW
P.102	[%]	ZW
P.103	[Volt]	ZW

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**Parameter P.17F**

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<b>P.17F</b>	<b>Unit</b>	<b>0</b>
P.140	[%]	0
P.142	[Hz]	0
P.143	[%]	100
P.145	[%]	0
P.147	[Hz]	0
P.148	[%]	100
P.160	-	5
P.161	[Hz]	120
P.162	[Hz]	120

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**Parameter P.18F**

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<b>P.18F</b>	<b>Unit</b>	<b>0</b>
P.180	[Hz]	10
P.181	[10 ms]	6000
P.185	[Hz]	7
P.186	[10 ms]	6000
P.189	[%]	0

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**Parameter P.205**

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<b>P.205</b>	<b>Unit</b>	<b>0000</b>	<b>0001</b>	<b>0200</b>	<b>0300</b>	<b>0700</b>	<b>0800</b>	<b>0900</b>
P.200	-	0	0	2	3	7	8	9
P.201	-	NS	NS	NS	0	1	NS	NS
P.202	-	0	0	0	0	0	13	8
P.25F	-	0	0	ZW	0	0	0	10
P.506	-	1106	1107	NS	NS	NS	NS	NS
P.507	-	1108	1109	0802	NS	NS	NS	NS
P.508	-	1110	1110	1112	NS	NS	NS	NS
P.509	-	1111	1111	0000	NS	NS	NS	1110
P.980	-	2	2	0	0	0	0	2

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**Parameter P.25F**


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P.25F	Unit	0	1	2	3	4	5	6	7	8	9
P.250	-	0	0	0	0	0	0	0	0	0	0
P.251	-	0	3	3	4	4	5	5	5	5	2
P.253	-	0	0	0	0	0	0	0	0	0	0
P.270	-	0	1	3	0	0	3	3	1	2	0
P.271	-	0	1	1	0	0	1	1	1	1	1
P.272	-	0	0	0	0	0	0	0	0	0	0
P.273	[Seconds]	5	5	5	5	5	5	5	5	1	5
P.280	-	0	0	0	1	2	2	1	2	2	0
P.281	-	0	0	0	1	1	1	1	1	1	1
P.282	-	0	0	0	0	0	0	0	0	0	0
P.283	[Seconds]	5	5	5	5	5	5	5	5	1	5

P.25F	Unit	10
P.250	-	0
P.251	-	2
P.253	-	3
P.270	-	0
P.271	-	1
P.272	-	0
P.273	[Seconds]	5
P.280	-	0
P.281	-	1
P.282	-	0
P.283	[Seconds]	5

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**Parameter P.39F**


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P.39F	Unit	0	1	2	3
P.221	[Increments]	0	0	0	0
P.222	[Increments]	400	400	400	400
P.223	[Increments]	60	60	60	60
P.225	[Increments]	0	0	0	0
P.226	[Increments]	0	0	0	0
P.228	[Increments]	50	50	50	50
P.229	[Increments]	50	50	50	50
P.231	[Increments]	0	0	0	0
P.232	[Increments]	500	500	500	500
P.233	[Increments]	70	70	70	70
P.235	[Increments]	0	0	0	0
P.236	[Increments]	0	0	0	0
P.239	[Increments]	50	50	50	50
P.240	[Increments]	25	25	25	25
P.242	[Increments]	0	0	0	0
P.244	-	0	0	0	0
P.275	[Increments]	0	0	0	0
P.285	[Increments]	0	0	0	0
P.310	[Hz]	60	60	60	60
P.312	[Hz/s]	100	50	150	200
P.315	[Hz]	20	20	20	20
P.317	[Hz/s]	40	40	40	40
P.320	[Hz]	20	20	20	20
P.322	[Hz/s]	80	40	120	160
P.325	[Hz]	40	40	40	40
P.327	[Hz/s]	40	40	40	40
P.332	[Hz/s]	400	400	400	400
P.342	[Hz/s]	150	150	150	150
P.343	[Hz/s]	40	40	40	40
P.348	[Hz/s]	300	300	300	300
P.350	[Hz]	40	40	40	40
P.352	[Hz/s]	80	40	120	160
P.355	[Hz]	20	20	20	20

<b>P.39F</b>	<b>Unit</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
P.357	[Hz/s]	40	40	40	40
P.360	[Hz]	20	20	20	20
P.362	[Hz/s]	40	20	60	80
P.365	[Hz]	30	30	30	30
P.367	[Hz/s]	20	20	20	20
P.372	[Hz/s]	400	400	400	400
P.374	[Hz/s]	400	400	400	400
P.382	[Hz/s]	150	150	150	150
P.383	[Hz/s]	40	40	40	40
P.388	[Hz/s]	200	200	200	200
P.390	[Hz]	20	20	20	20
P.392	[Hz/s]	66	66	66	66
P.395	[Hz]	20	20	20	20
P.397	[Hz/s]	66	66	66	66
P.398	[Hz/s]	200	200	200	200

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**Parameter P.460**

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<b>P.460</b>	<b>Unit</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
P.467	-	0	0	0	0	0	0	0
P.46D	-	0	0	0	1	1	0	0
P.46F	-	0	1	2	1	2	3	-1

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**Parameter P.470**

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<b>P.470</b>	<b>Unit</b>	<b>0101</b>	<b>0102</b>	<b>0104</b>	<b>0401</b>
P.471	-	3	3	3	3
P.472	-	0	0	0	0
P.473	-	4	4	4	4
P.474	-	4	4	4	4
P.475	-	0	0	0	0
P.477	-	0	0	9	19
P.479	-	0	0	0	49
P.47A	-	1	1	1	1
P.47D	-	0	1	0	0
P.47E	-	E	E	E	E
P.47F	-	1	1	1	4

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**Parameter P.50x**


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P.50x	Unit	0000	0101	0102	0103	0104	0105	0106	0107	0108	0109
P.5x0	-	0	1	1	1	1	1	1	1	1	1
P.5x1	-	0	0	0	5	0	1	1	3	1	2
P.5x2	-	0	0	0	0	0	0	0	0	0	0
P.5x3	-	0	0	1	1	1	0	0	0	1	1
P.5x4	-	0	1	1	1	1	1	1	1	1	1
P.5x5	-	0	1	1	1	1	1	1	1	1	1
P.5x6	-	0	3	3	3	1	3	2	3	3	3
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	0	1	1	1	2	1	3	1	1	1
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	0110	0111	0112	0113	0114	0116	0117	0120	0121	0124
P.5x0	-	1	1	1	1	1	1	1	1	1	1
P.5x1	-	0	0	0	6	5	0	0	1	0	1
P.5x2	-	0	1	0	0	0	0	0	0	0	0
P.5x3	-	0	0	0	0	1	0	0	0	0	1
P.5x4	-	1	0	0	1	1	0	0	1	1	1
P.5x5	-	1	0	1	1	1	1	1	0	0	1
P.5x6	-	1	3	3	3	2	1	2	2	1	2
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	2	0	1	1	1	1	1	1	2	3
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	0125	0129	0152	0165	0180	0201	0202	0204	0205	0223
P.5x0	-	1	1	1	1	1	2	2	2	2	2
P.5x1	-	1	1	16	18	4	2	2	2	4	4
P.5x2	-	0	0	1	1	0	0	0	0	0	0
P.5x3	-	0	1	0	0	0	2	3	0	0	0
P.5x4	-	1	1	1	2	1	1	0	0	0	1
P.5x5	-	1	1	1	0	1	1	1	1	0	1
P.5x6	-	2	1	3	3	2	3	3	3	3	3

P.50x	Unit	0125	0129	0152	0165	0180	0201	0202	0204	0205	0223
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	3	2	1	1	3	4	4	4	4	4
P.5xA	-	0	0	1	0	0	0	0	0	0	0

P.50x	Unit	0301	0302	0304	0401	0402	0403	0404	0407	0411	0501
P.5x0	-	3	3	3	4	4	4	4	4	4	5
P.5x1	-	0	1	0	0	0	1	1	2	2	0
P.5x2	-	0	0	0	1	0	1	0	0	1	1
P.5x3	-	2	0	0	0	0	0	0	0	0	4
P.5x4	-	0	0	0	0	0	0	0	0	0	4
P.5x5	-	0	1	0	0	0	0	0	0	0	1
P.5x6	-	3	3	0	0	0	0	0	0	0	3
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	5	1	5	6	6	6	6	6	36	7
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	0502	0504	0505	0506	0507	0509	0511	0520	0522	0530
P.5x0	-	5	5	5	5	5	5	5	5	5	5
P.5x1	-	0	0	0	0	0	0	0	0	9	0
P.5x2	-	1	1	0	1	0	1	1	1	2	1
P.5x3	-	4	4	4	4	4	4	4	4	4	4
P.5x4	-	4	2	4	2	4	5	5	4	2	4
P.5x5	-	1	1	1	1	1	1	1	1	1	1
P.5x6	-	3	3	3	3	3	3	3	3	3	3
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	7	7	7	7	7	7	7	7	52	60
P.5xA	-	0	0	0	0	0	0	0	1	0	0

P.50x	Unit	0601	0602	0701	0703	0704	0713	0714	0801	0802	0803
P.5x0	-	6	6	7	7	7	7	7	8	8	8
P.5x1	-	1	0	0	4	5	0	5	0	1	2
P.5x2	-	0	0	0	0	0	1	1	0	0	0
P.5x3	-	0	0	0	0	0	0	0	0	0	0
P.5x4	-	0	0	0	0	0	0	0	0	0	3

P.50x	Unit	0601	0602	0701	0703	0704	0713	0714	0801	0802	0803
P.5x5	-	0	0	1	1	1	1	1	0	0	0
P.5x6	-	0	0	0	0	0	0	0	0	0	0
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	8	8	9	9	9	9	9	10	10	28
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	0804	0901	0902	0903	1001	1002	1003	1004	1005	1101
P.5x0	-	8	9	9	9	10	10	10	10	10	11
P.5x1	-	2	5	7	0	0	4	3	2	7	1
P.5x2	-	0	0	0	0	0	0	0	0	0	0
P.5x3	-	3	0	0	0	0	0	0	0	0	0
P.5x4	-	3	0	0	0	0	0	0	0	0	0
P.5x5	-	0	0	0	0	0	0	0	0	0	0
P.5x6	-	0	0	0	0	0	0	0	0	0	0
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	28	11	11	11	12	12	56	12	12	19
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	1102	1103	1104	1105	1106	1107	1108	1109	1110	1111
P.5x0	-	11	11	11	11	11	11	11	11	11	11
P.5x1	-	2	6	0	0	4	4	5	5	9	10
P.5x2	-	0	0	0	1	0	1	0	1	1	1
P.5x3	-	0	0	0	0	0	0	0	0	0	0
P.5x4	-	0	0	0	0	0	0	0	0	0	0
P.5x5	-	0	0	0	0	0	0	0	0	0	0
P.5x6	-	0	0	0	0	0	0	0	0	0	0
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	25	22	20	20	21	21	23	23	24	26
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	1112	1113	1114	1116	1401	1402	1403	1404	1405	1406
P.5x0	-	11	11	11	11	14	14	14	14	14	14
P.5x1	-	3	3	7	10	1	0	8	6	7	9
P.5x2	-	0	1	0	0	1	1	1	1	1	1

P.50x	Unit	1112	1113	1114	1116	1401	1402	1403	1404	1405	1406
P.5x3	-	0	0	0	0	0	4	0	0	0	4
P.5x4	-	0	0	1	0	0	4	0	0	0	4
P.5x5	-	0	0	0	0	1	1	1	1	1	1
P.5x6	-	0	0	3	0	0	3	0	0	0	3
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	27	27	0	26	6	7	6	7	7	7
P.5xA	-	0	0	0	0	0	0	0	0	0	0

P.50x	Unit	1407	1408	1418	1420	1422	1501	1502	1506	1612	1613
P.5x0	-	14	14	14	14	14	15	15	15	16	16
P.5x1	-	3	4	6	0	9	0	2	1	10	0
P.5x2	-	1	1	0	2	2	0	0	1	2	2
P.5x3	-	4	4	0	4	4	0	0	0	0	4
P.5x4	-	4	4	0	4	2	1	0	0	0	4
P.5x5	-	1	1	0	1	1	0	0	0	0	1
P.5x6	-	3	3	0	3	3	3	0	0	0	3
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	6	31	6	52	52	2	9	6	52	52
P.5xA	-	0	2	0	0	0	0	0	0	0	0

P.50x	Unit	1624	1701	1801	1802	1803	1804
P.5x0	-	16	17	18	18	18	18
P.5x1	-	9	0	1	2	3	4
P.5x2	-	1	0	0	0	0	0
P.5x3	-	4	0	0	0	0	0
P.5x4	-	4	1	0	0	0	0
P.5x5	-	1	1	0	0	0	0
P.5x6	-	3	3	3	3	3	3
P.5x7	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0
P.5x8	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0
P.5x9	-	7	25	2	2	2	2
P.5xA	-	0	0	0	0	0	0

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**Parameter P.70x**


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P.70x	Unit	0000	0001	0101	0103	0201	0203	0401	0501	0601	0602
P.7x0	-	6	6	0	6	2	6	4	5	6	6
P.7x1	[Seconds]	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0
P.7x2	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x3	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x4	-	0	1	0	0	0	0	0	0	0	0
P.7x5	[Increments]	0	0	0	0	0	0	0	0	0	0
P.7x6	-	0	0	0	0	0	0	0	0	0	0
P.7x7	-	0	0	0	0	0	0	0	0	0	0
P.7x8	-	0	0	0	0	0	0	0	0	0	0
P.7x9	-	0	0	0	0	0	0	0	0	0	0
P.7xA	-	0	0	0	0	0	0	0	0	0	0
P.7xB	-	0	0	0	0	0	0	0	0	0	0
P.7xC	-	0	0	0	0	0	0	0	0	0	0
P.7xD	-	0	0	0	0	0	0	0	0	0	0
P.7xF	-	0	0	0	70	0	69	0	0	19	20

P.70x	Unit	0605	0606	0607	0612	0613	0630	0634	0701	0703	0801
P.7x0	-	6	6	6	6	6	6	6	7	7	8
P.7x1	[Seconds]	0,5	0,5	0,5	1000,0	1000,0	1000,0	1000,0	0,0	1000,0	1000,0
P.7x2	[Seconds]	0,1	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x3	[Seconds]	0,0	0,0	0,0	1,0	1,0	0,0	0,0	0,0	0,0	0,0
P.7x4	-	0	0	0	0	0	0	0	0	0	0
P.7x5	[Increments]	0	0	0	0	0	0	0	0	0	0
P.7x6	-	0	0	0	0	0	0	0	0	0	0
P.7x7	-	0	0	0	0	0	0	0	0	0	0
P.7x8	-	0	0	0	0	0	0	0	0	0	0
P.7x9	-	0	0	0	0	0	0	0	0	0	0
P.7xA	-	0	0	0	0	0	0	0	0	0	0
P.7xB	-	0	0	0	0	0	0	0	0	0	0
P.7xC	-	0	0	0	0	0	0	0	0	0	0
P.7xD	-	0	0	0	0	0	0	0	0	0	0
P.7xF	-	38	39	43	46	47	73	65	0	0	0

P.70x	Unit	1001	1002	1101	1102	1201	1210	1220	1221	1222	1223
P.7x0	-	10	10	10	11	12	12	12	12	12	12
P.7x1	[Seconds]	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0
P.7x2	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x3	[Seconds]	0,0	1,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x4	-	0	0	0	0	0	0	0	0	0	0
P.7x5	[Increments]	0	0	0	0	0	0	0	0	0	0
P.7x6	-	0	0	0	0	0	2	1	1	1	1
P.7x7	-	0	0	0	0	0	0	0	0	1	1
P.7x8	-	0	0	0	0	0	0	1	3	1	3
P.7x9	-	0	0	0	0	1	1	0	0	0	0
P.7xA	-	0	0	0	0	0	0	3	4	3	4
P.7xB	-	0	0	0	0	0	0	1	3	1	3
P.7xC	-	0	0	0	0	0	0	1	1	1	1
P.7xD	-	0	0	0	0	0	0	1	1	1	1
P.7xF	-	0	0	0	0	0	0	0	0	0	0

P.70x	Unit	1224	1232	1233	1250	1251	1252	1253	1255	1263	1264
P.7x0	-	12	12	12	12	12	12	12	12	12	12
P.7x1	[Seconds]	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0
P.7x2	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x3	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
P.7x4	-	0	0	1	0	0	0	0	0	0	1
P.7x5	[Increments]	0	0	0	0	0	0	0	0	0	0
P.7x6	-	1	1	1	3	3	3	3	3	3	3
P.7x7	-	1	1	1	0	0	1	1	1	1	1
P.7x8	-	1	1	1	1	3	1	3	1	1	1
P.7x9	-	6	6	6	0	0	0	0	6	6	6
P.7xA	-	1	1	1	3	4	3	4	1	1	1
P.7xB	-	1	1	1	1	3	1	3	1	1	1
P.7xC	-	1	1	1	1	1	1	1	1	1	1
P.7xD	-	1	1	1	1	1	1	1	1	1	1
P.7xF	-	20	51	51	0	0	0	0	19	50	50

P.70x	Unit	1295	1298	1601	1701	1801	1901	2001	2101	2201	2301
P.7x0	-	12	12	16	17	18	19	20	21	22	23
P.7x1	[Seconds]	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0	1000,0
P.7x2	[Seconds]	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0

P.70x	Unit	1295	1298	1601	1701	1801	1901	2001	2101	2201	2301
P.7x3	[Seconds]	0,0	0,0	0,0	0,0	0,5	0,5	0,0	0,0	0,0	0,0
P.7x4	-	0	0	0	0	0	0	0	0	0	0
P.7x5	[Increments]	0	0	0	0	0	0	0	0	0	0
P.7x6	-	4	4	0	0	0	0	0	0	0	0
P.7x7	-	0	0	0	0	0	0	0	0	0	0
P.7x8	-	0	1	0	0	0	0	0	0	0	0
P.7x9	-	1	0	0	0	0	0	0	0	0	0
P.7xA	-	3	3	0	0	0	0	0	0	0	0
P.7xB	-	0	1	0	0	0	0	0	0	0	0
P.7xC	-	0	1	0	0	0	0	0	0	0	0
P.7xD	-	0	1	0	0	0	0	0	0	0	0
P.7xF	-	0	0	0	0	0	0	0	0	0	0

P.70x	Unit	2501	2601	3201
P.7x0	-	25	26	32
P.7x1	[Seconds]	1000,0	1000,0	1000,0
P.7x2	[Seconds]	0,0	0,0	0,0
P.7x3	[Seconds]	0,0	0,0	0,0
P.7x4	-	0	0	0
P.7x5	[Increments]	0	0	0
P.7x6	-	0	0	0
P.7x7	-	0	0	0
P.7x8	-	0	0	0
P.7x9	-	0	0	0
P.7xA	-	0	0	0
P.7xB	-	0	0	0
P.7xC	-	0	0	0
P.7xD	-	0	0	0
P.7xF	-	0	0	0

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**Parameter P.991**

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<b>P.991</b>	<b>Unit</b>	<b>0</b>
P.110	-	0
P.17F	-	0
P.18F	-	0
P.205	-	ZW
P.210	-	5
P.39F	-	0
P.465	-	0
P.501	-	0101
P.502	-	0401
P.503	-	0701
P.504	-	0201
P.505	-	0501
P.506	-	0301
P.507	-	0601
P.508	-	0802
P.509	-	1003
P.50A	-	1001
P.50B	-	0106
P.50C	-	0110
P.50D	-	0000
P.50E	-	0000
P.50F	-	0000
P.608	-	0223
P.609	-	0223
P.701	-	0101
P.702	-	0201
P.703	-	3201
P.705	-	1220
P.706	-	1201
P.707	-	1250
P.708	-	1210
P.709	-	0000
P.70A	-	0000

<b>P.991</b>	<b>Unit</b>	<b>0</b>
P.70B	-	0001
P.70C	-	0000
P.70D	-	0000
P.70E	-	0000
P.70F	-	0001
P.970	-	0
P.971	[1000 Cycles]	1000
P.972	[Cycles]	1000
P.973	-	0
P.985	-	1
P.A01	-	0104
P.A02	-	0901
P.A03	-	0502
P.A04	-	0107
P.A05	-	0109
P.A06	-	1002
P.A07	-	0106
P.A08	-	0802
P.D05	-	0001
P.D06	-	0001
P.D07	-	0000
P.D08	-	1295
P.D09	-	1298
P.F00	-	0
P.F1F	-	0000
P.F2F	-	0000
P.F3F	-	0000
P.F4F	-	0000

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**Parameter P.F1F**


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P.F1F	Unit	0000	F101	F102	F103	F104	F201	F202	F203	F206	F207
P.F10	-	0	1	3	1	1	4	1	4	4	4
P.F11	-	2	0	0	0	0	1	1	1	1	1
P.F12	-	0	0	0	0	0	1	0	1	1	1
P.F13	-	1	0	0	0	0	1	1	1	1	1
P.F16	-	1	1	1	2	3	3	3	3	3	3
P.F19	-	0	52	52	52	52	49	49	51	16	53

P.F1F	Unit	F301	F302
P.F10	-	4	4
P.F11	-	2	2
P.F12	-	1	1
P.F13	-	1	1
P.F16	-	2	2
P.F19	-	0	0