



## KEB Drive Safety Components

## FAQ No. 001

Part	Version	Revision	Datum	Status	Release	Review
de	003	001	2019-08-28	Released	VZ7	EST

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## Purpose of this document

These statements provide information and explanations on frequently asked questions about the safety-related components of KEB Automation KG. This document is not legally part of the certified device documentation. The functions described in the current KEB documentation must always be given priority. If you have any questions, please contact KEB Automation KG or your area representative.

## 1. Generals

### 1.1. Official documents

- The corresponding standards which are listed in the respective product documentation.
- IFA Report 07/2013e: Safe drive controls with frequency converters. Link: <http://www.dguv.de/ifa/publikationen/reports-download/reports-2013/ifa-report-7-2013/index-2.jsp>
- In the SISTEMA Cookbook several samples are offered: <http://www.dguv.de/ifa/praxishilfen/practical-solutions-machine-safety/software-sistema/sistema-kochbuecher/index.jsp>

### 1.2. Why don't have the KEB devices any safe feedback contacts?

The KEB devices with safety functions according to EN 61800-5-2 have no or "not safe" feedback contacts.

The feedback contacts, which are required for safe relay circuits via positively driven contacts in accordance with ISO 13849-1 Cat 3, have the task of detecting "sticky" contacts and thus achieving the required diagnostic coverage via an evaluation unit.

Without this diagnostic possibility you will not know if both or only one channel is still switching. If only one channel is working the category 3 will not be respected and the risk of a complete failure of the switching is increasing strongly.

The safety functions implemented in the KEB devices have either Cat 4 (several failures do not lead to dangerous failure) and diagnostic coverage "high" (> 99%), or Cat 3, diagnostic coverage "medium" (=> 90% <99%) and an internal check if both channels are working safely. Thereby a feedback and external monitoring is not required.

### 1.3. Diagnosis for the safety related mechanical brakes

Mechanical safety brakes must be regularly checked for function depending on the category to be achieved.

With mechanical brakes, the braking or holding torque can be reduced due to wear. Likewise, brake torque generating components may break (e.g., the springs, lining, or torque support).

The safety function SBC-Safe Brake Control provided by KEB can only ensure that the brake voltage is switched off. With a zero current-operated brake, it is assumed that the braking torque is generated if the function is correct. The SBC function cannot check the function of the brake.

Within limits, the current monitoring at the brake output of the drive can only detect whether the brake is connected or the brake coil has a short circuit. In both cases, however, normally the safe state (vertical axis / brake closed) would be maintained.

In which interval and how the brake has to be tested depends on the application. Some machine standards go into it.

With the safety module 5 there is the option to evaluate a feedback in relation to the control signal (for example for micro switches or relays) and thus to be able to check the switching status.

The use and the diagnosis of safety-oriented brakes is concerned with e.g. the IFA Report 07/2013 Chap. 6.4.3 and Appendix C

Link: <http://www.dguv.de/ifa/publikationen/reports-download/reports-2013/ifa-report-7-2013/index-2.jsp>

## **1.4. Is the safety certificate valid without HF-Filter?**

Basically, when in use in the EU, the applicable directives must be complied with. The RFI filter is required for compliance with the EMC Directive. Other non-European countries may have different rules. The tests of the KEB Drive Controllers with Functional Safety are carried out without an attached RFI filter if the device is without it.

The FS properties are maintained without filters.

## **2. KEB Devices with STO Function**

### **2.1. The drive runs into STO sometimes while operation**

In many safety controls the transistor outputs must be checked regularly. That means the signal is interrupted cyclically for short time and it will be observed if the voltage drops (i.e. the switching transistors are working well) (OSSD-signals).

In the COMBIVERT F5, F6-K, S6-K and G6 the voltage at the STO connection is buffered by internal capacitors. The duration of the buffer depends on the capacitance of the capacitors, the signal voltage and whether the inverter modulates or not. Details can be found in the operating instructions.

If the signals are missing for longer than the filters are running or the voltage can be buffered, the drive briefly goes into STO state.

When the signal is back, the inverter will leave STO again automatically. Depending on the setting, the inverter then behaves as after normal setting of the controller release (e.g. speed search, rotor position calibration, start of the ACC ramp at 0, etc.).

For some controllers, the length of the test pulses can be set.

One solution is to put relays in between, which keep their condition due to their inertia.

### **2.2. The safety controller reports errors when testing an output**

In many safety controls the transistor outputs must be checked regularly. That means the signal is interrupted cyclically for short time and it will be observed if the voltage drops (i.e. the switching transistors are working well) (OSSD-signals).

In the COMBIVERT F5, F6-K, S6-K and G6 the voltage at the STO connection is buffered by internal capacitors. The duration of the buffer depends on the capacitance of the capacitors, the signal voltage and whether the inverter modulates or not. Details can be found in the operating instructions.

The voltage on the signal line drops so delayed. The control detects this and concludes that the transistor cannot switch off the voltage, which would be a dangerous condition.

As a solution, decoupling diodes between the control output and the STO input can be used.

For some controllers, the OSSD signals can also be adjusted.

## 3. Safety module 1 in F6-A, S6-A, H6

### 3.1. Functionality SBC – Description of the function of the monitoring of the brake supply current

The safety module monitors the current of the brake supply voltage. It is not safety related but can be used for service and protection of the brake.

Monitoring is carried out only with the release of the voltage.

The current monitoring can be switched off with parameter co82: "sm-cs = 0 / off" in the drive parameters. After the change, a power OFF – ON of the 24V supply of the drive must be made.

#### Monitoring of maximum current:

If approx. 4A current is exceeded, the safety module goes into fault and the drive shows in parameter ru01: 55 = error safety module. The fault can only be reset by power OFF - ON of the 24V supply of the drive and acknowledgment in the drive.

#### Monitoring of minimal current:

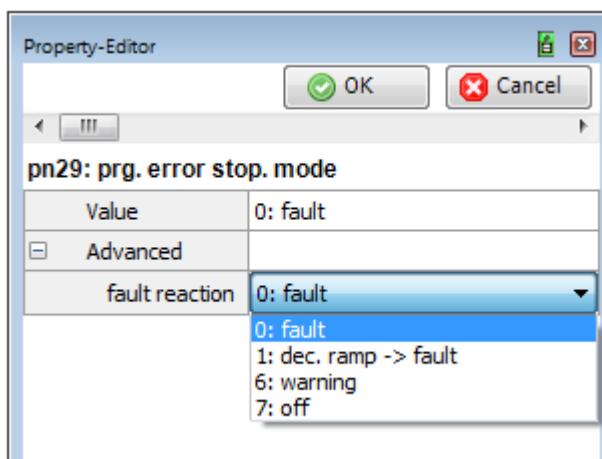
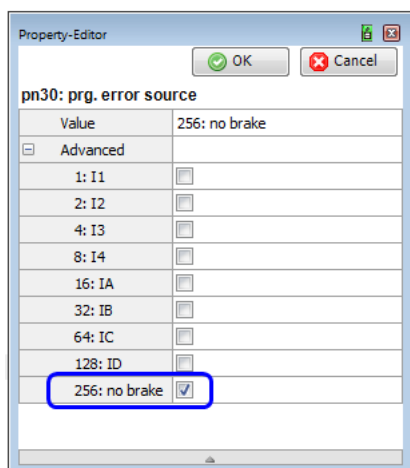
This can be used to monitor whether a brake is connected at all. Even a cable break can be detected.

If the current falls below a certain value (~ <100mA), however, no error is triggered. The minimal current can only be measured inaccurately because of the strong oversizing of the switching transistor.

Therefore, there is no direct error message "Minimum current undershot".

In drive parameter Sb29 (2F1Dh), bit 8 (or bit 22 in the case of a double-axis module) displays a warning message if too low current is detected (it is always "on" if the current measurement was switched off: co82 = 0).

Bit 8 can be evaluated in a PLC. The update cycle is 1ms to 80ms. In addition, the drive can be brought into error state when the minimum current is undershot via the "programmable error" function. To do this, set the condition in parameter pn30 = "256: no brake" and the error reaction in pn29 "0: fault".



The detection of whether a brake is connected (I = 0A) can only be carried out when a voltage is switched to the brake.

The minimum current monitoring does not work directly on the digital output SBC (terminal X2B, 19/20) on the safety module. The output is "on" if both SBC inputs are supplied with voltage and the brake bit 15 of the control word is set and the status "no SM errors" is present.

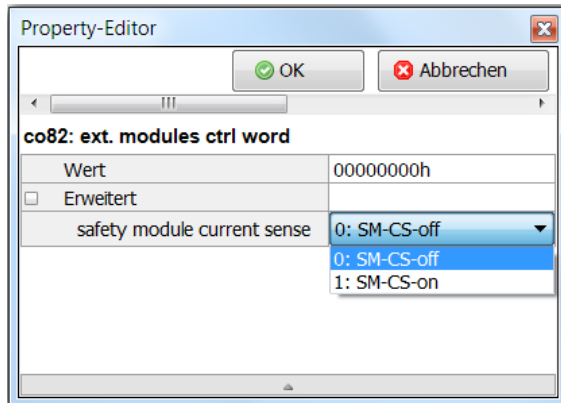
For further information see instructions for use Safety Module 1 No. 20109577.

### 3.2. Function SBC – Switching of brake by intermediate relay

If the brake current is more than 2A (or 3.3A at double axis module) or the voltage of the brake not 24V is, an intermediate relay has to be used. This relay is part of the safety chain and must be integrated as a safety component.

Please note:

If the current of the relay is lower than ca. 100mA, the brake current monitoring has to be switched off by parameter co82.



**The relay must never connect the "Br-" terminal to ground** (e.g. electronic relay, external current monitoring or freewheeling circuit). The grounding would interrupt the internal cyclic test of the brake switching transistors and the module would go into fault state.

Internal brake transistor test: in order to ensure the switching capability of the 2 (or 3 at double axis module) brake transistors, they will be switched cyclically and the switching state will be monitored (e.g. voltage drop at switching off). The test length is typically 10ms. The test cycle period is about 48min. This time will be shared to 4 different tests running one after the other every 12min. So can happen, that the drive opens the brake and after time x the safety module error occurs. That indicates that the brake test is failed.

Reason for failed test:

- Br- terminal connected to ground (Parameter Sb29 shows "Bit 11 Low-side-switch high-resistance" or "Bit 12 Low-side-switch short-cut").

The parameter Sb29 is shown in the drive parameters and also in safety module editor state (from COMBIVIS version 6.4.0). The description can be found in the manual of the safety module.

## 4. Safety module 2 and 3 in F6-A, S6-A, H6:

### 4.1. User configuration, user access, login

#### 4.1.1. What happens if a wrong user or a wrong password is entered?

The password or the user can be entered 3-times a wrong value. At fourth entering of wrong value the safety module goes to error state and locks for 5min. In the log file a notice will be shown. After the waiting time a new trial can be worked out.

Index	Type	Date & Time	Pc	Sp	Ti	Details
0	0: Error	2018-02-07 3:06:33 PM				707: Warning: + Cpu 2 + The maximum number of login attempts is reached. Please wait 5 Minutes for the next attempts. You can try it again if this messages disappears.
1	0: Error	2018-02-07 3:04:58 PM				705: Warning: + Cpu 2 + User id unknown. The user is not registered in the safety module. Please register the user first.
2	0: Error	2018-04-22 8:58:06 PM				No Error
3	0: Error	2017-07-24 8:14:54 AM				No Error

#### 4.1.2. The user login data are not known or got lost.

Lost access data cannot be reconstructed by KEB! The module can be reset to the factory settings. For this, contact the KEB Service! The configuration settings will be lost at this procedure!

#### 4.1.3. Which data can be seen or changed without user access?

Without user access the following data are shown:

- Status messages like input state or output state, error messages, current speed or position values
- Module-time of day
- Log-Files (error storage or status storage)
- Firmware version

Following values can be changed without user access:

- The time of day can be changed once after Power-On
- Blinking on/off

## 4.2. Technical characteristics

### 4.2.1. How does the safety module behave in the event of a power supply failure?

The safety module doesn't detect a fault of the dc-link voltage.

If the 24V supply is still present with external supply and if necessary UPS (and the encoder also receives voltage), all functions are executed anymore.

E.G.: The function SS1 will be monitoring the encoder speed furthermore and if the drive doesn't follow the DEC-ramp STO will be triggered.

In F6 or S6 an external 24V supply is needed. At H6 the 24V supply unit can be supplied by the DC-link rail. If the 24V supply fails, all outputs are switched off when 20.4 Vdc is exceeded and the status of the inputs is set to 0. By this STO and SBC are triggered. After a time, the processors will no longer have any voltage. How long the CC can supply the 24V bus depends on the power consumers and, if necessary, regenerative operation in the system.

It must also be noted how an external safety controller behaves and possibly switches safety functions on its own.

### 4.2.2. How sensitive is voltage monitoring?

The safety module monitors the supply voltage. The tolerance window of the Power supply to the drive control board is 24V + -5% (see Installation Instructions). The tolerance on the safety module is 24V + -10%. Because of the polarity reversal protection circuit reduces the actual voltage at the safety module and the supply voltage for the brake also is typically - + 10%, the tolerance at the 24V input must be

smaller.

The limit values for the voltage check in the safety module are 24Vdc -15% + 20%, the measuring cycle is 0.5 ms, whereby the filter is 2 ms. If this value is exceeded or undershot, the module goes into the error state.

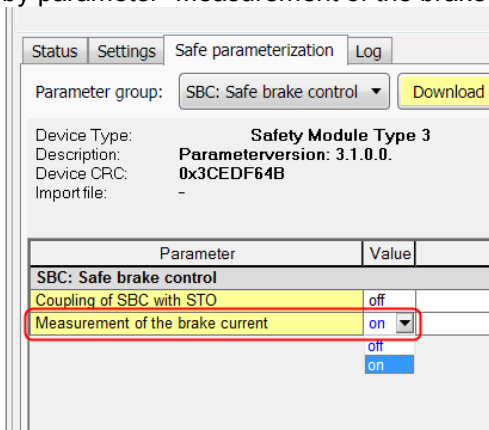
### 4.3. Connection, Wiring

#### 4.3.1. Function SBC – Switching of brake by intermediate relay

If the brake current is more than 2A (or 3.3A at double axis module) or the voltage of the brake not 24V is, an intermediate relay has to be used. This relay is part of the safety chain and must be integrated as a safety component.

Please note:

If the current of the relay is lower than ca. 100mA, the brake current monitoring has to be switched off by parameter “Measurement of the brake current” in the group “SBC: brake control”.



**The relay must never connect the "Br-" terminal to ground** (e.g. electronic relay, external current monitoring or freewheeling circuit). The grounding would interrupt the internal cyclic test of the brake switching transistors and the module would go into fault state.

Internal brake transistor test: in order to ensure the switching capability of the 2 (or 3 at double axis module) brake transistors, they will be switched cyclically and the switching state will be monitored (e.g. voltage drop at switching off). The test length is typically 10ms. The test cycle period is about 48min. This time will be shared to 4 different tests running one after the other every 12min. So can happen, that the drive opens the brake and after time x the safety module error occurs. That indicates that the brake test is failed.

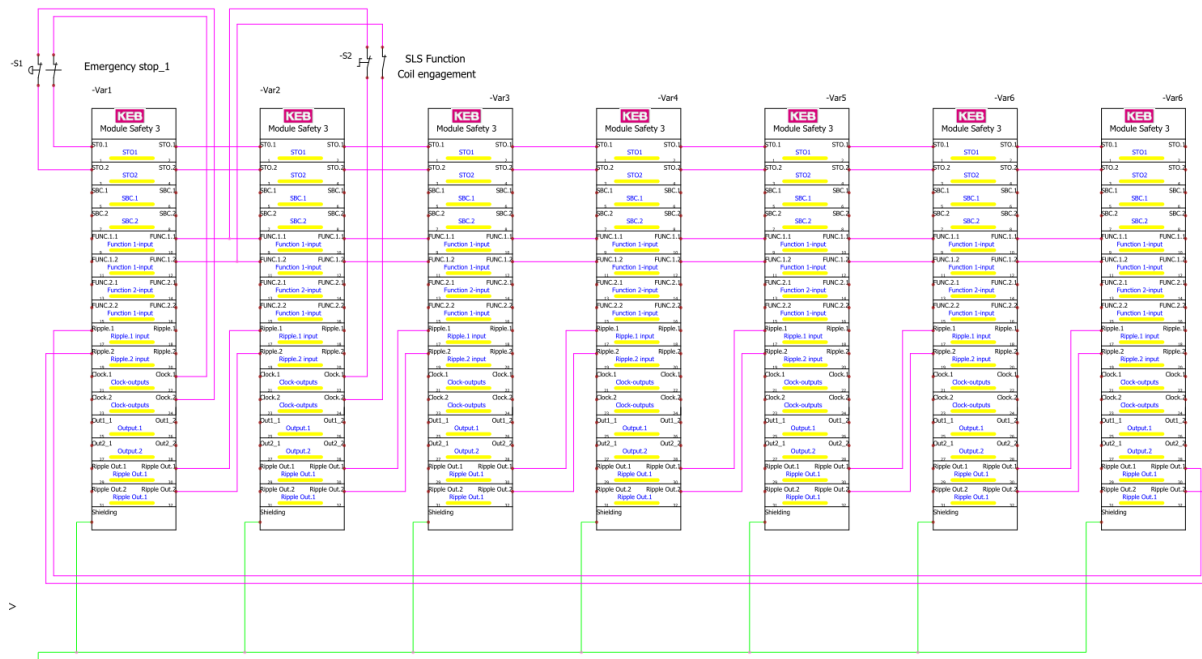
Reason for failed test:

- Br- terminal connected to ground (Error message shows “Low-side-switch high-resistance” or “Low-side-switch short-cut”).

#### 4.3.2. How many safe inputs can be connected to the clock outputs at the same time?

The clock output delivers per channel maximum 100mA. According to the specification, the safety inputs should take not more than 15mA. The real current consumption of the safe inputs of Module 2 or 3 is not more than 7mA. Thus up to 13 safe inputs can be connected to a clock output at the same time.





Example with 7 safety modules: STO and SLS are switched simultaneously from one clock output via safe switches on all modules. Since 14 inputs cannot be supplied by 1 output, the STO line from the 1st module and the SLS line from the 2nd module are supplied. As a result, different OSSD clock signals can be used on both circuits and a cross-circuit would be detected.

### 4.3.3. Using of the safety module like a safe I/O module

With the corresponding device description file, which contains the status of the inputs and outputs, the status of the safe inputs and outputs can be evaluated or switched directly via FSoE by the safe PLC. Often this can be used to save an additional COMBICONTRONAL Safe I / O module. Compared to the safe KEB I/O modules, it should be noted that the two input channels on the safety module are not independent, but must always be switched simultaneously. The safety characteristic values also apply to this usage. For the inputs STO, SBC, F1 and F2, the clock signals can be used.

### 4.3.4. Is it possible to switch the 2-channel safe inputs via two different ways?

Sample: both channels of the STO input may be enabled by two different ways, one channel by door contact and the other by safe control. In safety module 2 and 3, monitoring takes place whether both signals of the two channels switch simultaneously. A tolerance of maximal 1sec (SM2: 0.1s) can be adjusted. That means if one channel is switching the other must be switched in the tolerance time, otherwise the safety module triggers an error und will be locked in safe state. This error can only be disabled by Power-On-Reset of the drive controller.

Parameter	Value	
<b>STO Hardware input configuration</b>		
Configuration of the STO-Inputs	STO Safe torque off	
Tolerance time of the STO-Inputs	0.010000	s
Status of the STO-Inputs	equivalent	

One solution would be to use two (2-channel) inputs with the same safety function. The two channels must then each be bridged. If 2 inputs with the same function are assigned, these are "and" -connected. This would again be a 2-channel structure. There is no time dependence between these.

Note: appropriate error detection must be implemented to detect the failure of either channel. In the method shown here, this cannot be done by the safety module.

For KEB devices that only have the STO function, such as F5, G6, S6-K or F6-K, the simultaneity is not monitored and the sample constellation could be used. Using of the KEB safety control and the safe I/O modules would be also a solution, because the signals of each channel are merged only in the SPLC.

#### 4.3.5. Why has the Ripple-Output inverse logic to the Outputs 1 and 2?

An essential safety principle is that the safe state must be achieved if the cable breaks. Depending on the switched function, this can be achieved with the reverse switching logic.

Sample:

If the OUT 1 operates on the function Safe Speed Monitored, the Out 1 is on 24V when the safe low speed is detected. (Cable break principle 0V = unsafe condition).

The ripple-out would have 0V. So the ripple-out cannot be used for that.

But if, for example, the state STO is to be enabled from one module to another module or to a "normal" drive controller with STO input, the output must be 0V. At 24V on the ripple-out the 2nd drive will be in state "not STO", means in release. (Safe Torque Off (= modulation off) is active on the terminals at 0V).

#### 4.3.6. Which safety category the outputs 1 and 2 have?

The two 1-channel outputs 1 and 2 each have 2 switching transistors. Therefore, both outputs are internal Cat 3. A 2-channel output structure is obtained when both outputs are set with the same safety function (e.g., SSM).

#### 4.3.7. Do the outputs 1 and 2 have OSSD signals?

To reach the Cat 3, it is necessary to cyclically check the switching transistors. The test interval is 30 min. The transistors are switched off one after the other and checked whether the voltage drops at the output. If not, the safety module goes in error state. An infeed of voltage into the output is detected. When used as a 2-channel output (see chapter 4.3.6), it can be used to detect whether there is a short circuit between the channels.

#### 4.3.8. How is the behavior of the functions at switching of an index (only SM3)?

The safety module 3 has 8 indices for some safety functions. This allows you to store up to 8 configurations in the module. They can be activated via safe inputs or FSoE. All settings belonging to an index are always active at the same time. Means: all values of the functions in index 1 are active or all from index 2 and so on... Not index depending values are always active. The functions behave differently if the index is switched during execution of the safety function.

1. **SLP:** If the position is within the permissible range after an index changeover and the error reaction SS1 is running, SLP and SS1 are immediately aborted. Vice versa, this also applies if, after the index changeover, the position is in the non-permitted range. SLP will be executed immediately with the error reaction set there.
2. **SEL:** (SEL is a derivate of SLP) There is a distinction:
  - a. **SEL enabled by SLP:** After changing the index, the new maximum and minimum positions are used immediately, thus dynamically adapting SEL. This will immediately check the maximum speed limit for SEL.
    - i. Example: If an index switchover is performed and SEL / SLP are activated, SEL automatically checks the maximum permissible speed at the current position. If the speed is too high the error function will be executed.
  - b. **SEL triggered by FSoE:** The start position is retained. The maximum and minimum position is adjusted dynamically. The permissible speed as well.
3. **SOS:** The starting position remains. The configured limits are adjusted dynamically.
4. **SLI:** The new configured limits will be adapted dynamically.
5. **SS1 and SS2:** If an index switch occurs, the following applies:
  - a. **Ramp:** The former ramp will be used continuously until the SS1/SS2 function is restarted. This also applies when switching between type B and type C. As long as the safety function is not terminated by the disabling of the SS1/SS2 bit, the old ramp is used.
    - i. **Attention:** When switching from type B to type C, the ramp will not continue and stops. If you switch back to type B, the ramp continues to run at this point. This may cause the current speed to be out of range after reverting to Type B, and the error function will be executed. This does not apply when switching between type B and C and only type B.
  - b. Time window for speed deviation: The new time window is used.
    - i. **Attention:** If there is a constant switchover between type B and type C, as long as type C is set, the time window for the speed deviation is not calculated because a speed deviation is not checked.
  - c. **Type C time:** The new time is used.
    - i. **Attention:** If you are constantly switching between type B and type C, the timer will not count down during type B phase.
  - d. **Selection of function type:** The new function type is used immediately (for example, B + C switches to C).
    1. When switching from type C to type B for the first time, the current speed is taken as the starting speed and the ramp is checked (the ramp of the current index). Otherwise, the assumption of 5a applies for a recurring switchover.
    2. If you switch from type C to type C, then only the new type C time will be used, the timer will not restart at 0. So it may be that after switching over at a smaller type C time, the end function is executed immediately.
6. **SLS, SSM, and SMS:** The new limits will be used immediately.
7. **SLA:** The new limits will be used immediately.

### **4.3.9. Special adjustments for motor identification with COMBIVIS wizard at using of FSoE.**

The motor identification requires a modulation at the output of the drive (state "not STO") and, if present, an opening of the stopping brake (state "not SBC"). Because of the required manipulation and process reliability, the required adjustment is associated with some effort.

The commands to start the identification are typically given via COMBIVIS and the diagnostic interface. To do this, the process data communication must be switched off. Otherwise all commands entered in the COMBIVIS would be immediately overwritten by the bus data.

Switching off the process data communication inevitably also interrupts the safe communication (FSoE). This detects the safety module and goes into the error state.

To release the modulation, the configuration of the SM must be changed. The FSoE communication must be deactivated, but digital inputs for STO and, if needed, SBC must be activated.

It must be ensured that no danger can occur during the ident run.

There must be user rights for uploading and downloading a configuration.

The existing configuration of the SM must be saved.

Via the Safety Editor in COMBIVIS the default configuration list must be selected. If necessary the safety address must be adapted in the list if it is not "0" in the safety module. The list must be loaded into the SM (see also chapter 4.4.5).

The identification run can be carried out via COMBIVIS.

After finish, the configuration of the safety module must be restored and the function checked according to the test instructions before the machine goes back into operation.

If necessary, the change and the review must be documented. Changes to the configuration of the SM are recorded in the log file of the SM.

## **4.4. Safety functions, software functions**

### **4.4.1. Interruption of a function while running (e.g. SS1)**

The safety functions can be interrupted at any time by supplying voltage to the input or setting of the control word. This will shut off the monitoring immediately.

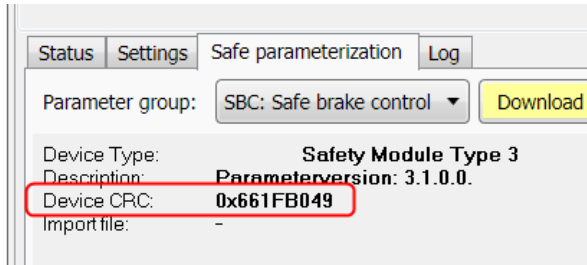
Example: The SS1 function runs into the STO function after deceleration to standstill. If you interrupt SS1 in the middle of the ramp (24V returns to the input), the monitoring stops immediately and the drive can accelerate again or continue driving constantly.

### **4.4.2. Can I delete the log files?**

The last 20 log files of each category are stored non-volatile in the safety module. They cannot be deleted.

### **4.4.3. Does the CRC checksum change when a limit is written cyclically over FSoE?**

The CRC checksum of the configuration must be matching to the checksum stored in the Safe FSoE PLC. Thus an intermediately changed configuration in the drive can be detected by the PLC.

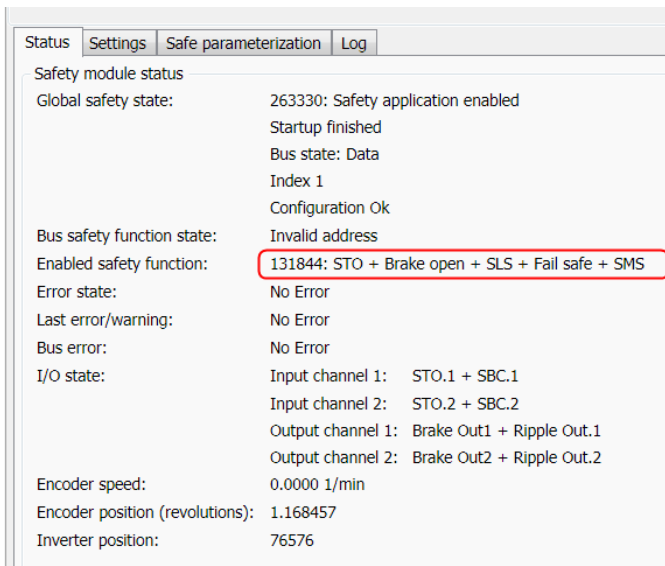


The CRC checksum is calculated at configuration download. Changing of limits later (e.g., SLS Upper Limit) over FSoE will not change the configuration and will not affect the CRC checksum. After power-on the module is loading the original value from the configuration.

#### 4.4.4. Which safety function has triggered the failure?

If a safety function has detected that a limit value has been violated, the safety module enters the "Safety function error". How can be recognized which function triggered the error?

The safety editor contains the status message "Activated safety function": The active safety functions are listed there. The order does not matter! Unfortunately, it is not easily to recognize which function triggered the error. STO can be left outside and SMS is always on. So in this example, SLS or SMS triggered the error:



Please disable the safety function by switching on the input. The safety function, which does not leave from the status display, has triggered the error. If there is only SMS, it was SMS. Note: the error must not have been acknowledged, the module must not have been switched off.

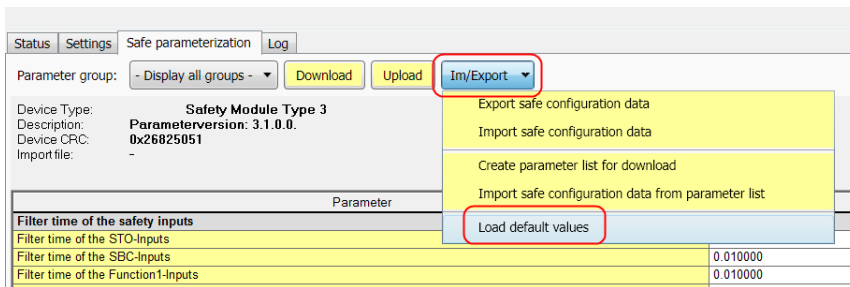
Please do not try to supply the 24V by cable bridges or with a separate cable. That would be a manipulation of the safety function and would require at least a check of the wiring before the machine is restarted.

Index	Type	Date & Time	Pc	Speed	Ti	Details
0	3: Safety function request	2017-11-29 3	77	601.2040 1/min	80	65921: STO + Brake open + Fail safe + SLS + SMS
1	3: Safety function request	2017-11-29 2	28	0.0000 1/min	24	65792: Modulation enabled + Brake open + SLS + SMS
2	3: Safety function request	2017-11-29 2	28	0.0000 1/min	28	65794: Modulation enabled + Brake closed + SLS + SMS
3	3: Safety function request	2017-11-29 2	28	0.0000 1/min	60	65539: STO + Brake closed + SMS
4	3: Safety function request	2017-11-29 2	28	0.4001 1/min	45	65794: Modulation enabled + Brake closed + SLS + SMS
5	3: Safety function request	2017-11-29 2	0	0.0000 1/min	27	65539: STO + Brake closed + SMS

#### 4.4.5. With which configuration is the safety module delivered? How can you simply run the engine during startup of the machine?

When delivered, there is no configuration in the safety module. Means, the drive is not ready to run. At least one user must be created and one configuration must be loaded into the module.

A basic function can be achieved by loading the default configuration. Thus, the digital inputs STO and SBC are active and the drive can be moved under the required safety precautions by connecting STO and (if a brake is connected) SBC. Encoder and FSoE are not evaluated.



The screenshot shows the 'Safe parameterization' menu with the 'Im/Export' dropdown open. The 'Load default values' option is highlighted with a red box. The device information is: Safety Module Type 3, Parameter version: 3.1.0.0, Device CRC: 0x26825051.

#### 4.4.6. Coupling of SBC and STO

If both functions STO and SBC shall be enabled simultaneously, by parameter "Coupling of SBC and STO" the SBC function can be linked to the function STO.

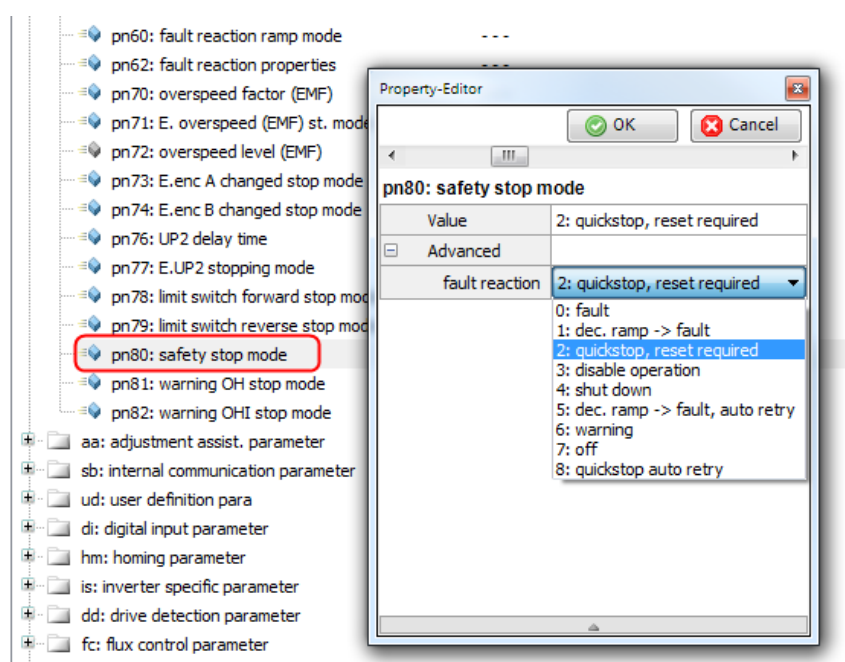
Parameter	Value
<b>SBC: Safe brake control</b>	
Coupling of SBC with STO	off
Measurement of the brake current	on

This means that when activating STO SBC is triggered with. Conversely, activating SBC does not include STO.

For SM3, no input SBC may or must be assigned. In SM2, the fixed SBC input can be bridged with the clock output depending on the application.

### 4.4.7. How can the drive decelerate when the safety module is in function SS1 or SS2 and monitors the ramp?

When a safety function (e.g. SLS) violates the limit and the (selectable) error response SS1 is executed, the Safety Module monitors the deceleration ramp. However, the ramp must be executed by the drive. The Safety Module must therefore tell the drive that the deceleration should be performed. As of firmware V2.5 there is parameter pn80: "safety stop mode" in COMBIVERT S6 and F6. It sets how the drive reacts when the safety module is in SS1 or SS2 status.



If the status SS1 or SS2 is exited again, the safety stop mode condition is also exited and the drive reacts like the setting in pn80. For example, with "auto retry" then accelerates back to the setpoint.

Note: if the quick stop is to be used, it must be activated in addition to pn80 via the parameters "605Ah quick stop option code" and "co32 state machine properties bit 9 (512)".

For F6 / S6 firmware <= V2.4 or COMBIVERT H6 / SM2, an output must be configured on the SM and then connected via line to a normal digital input on the F6/S6/H6. The digital input must be configured with the hold function (e.g. quick stop).

### 4.4.8. How can an error message be read from the safety module by bus system and displayed?

A separate FAQ document is built to explain the function

### 4.4.9. How can the CRC be read by the bus system?

A separate FAQ document is built to explain the function



### 4.5. The function is not like expected

#### 4.5.1. The configuration of the terminals are correct, but no function is released

If the inputs are wired correctly and the configuration assigns the correct functions to the inputs, but no safety function releases, check whether bus operation is switched off.

If the bus type is released to "FSoE" the safety module expects an enabling by safety bus control word. The terminals and the bus control word are ordered in line. Only if the bus type is set to "No bus" the module reacts on the terminals exclusively.

The screenshot shows a software interface for parameterizing a safety module. At the top, there are tabs for 'Status', 'Settings', 'Safe parameterization', and 'Log'. Below the tabs, the 'Parameter group' is set to 'Bus general options' with a 'Download' button. The device information is as follows:

- Device Type: Safety Module Type 3
- Description: Parameter version: 3.1.0.0.
- Device CRC: 0x3CEDF64B
- Import file: -

Parameter	Value
<b>Bus general options</b>	
Bus type	No bus
Safety address	10
Control and status word data length	11



## Disclaimer

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