Replacement of a consortium monitor

Description

Manual

Your automation, our passion.

PEPPERL+FUCHS

Content

PEPPERL+FUCHS

1. General

This document describes the replacement of a consortium safety monitor with the basic safety monitor. First, a subdivision must be made into the various use cases. Then a circuit example is explained for each use case and the procedure in the ASIMON software is described.

PEPPERL+FUCHS

2. Electronic Outputs

The safety basic monitor has two electronic outputs, which can be used for switching loads up to 0.5 A. The electronic outputs can be used for all switching operations where semiconductor switches are permissible and the output voltage is 30 V maximum.

2.1 Signal Outputs

The safety basic monitor has 2 signal outputs for replacing the consortium monitor. The status of the signal outputs reflects the status of the two output switching elements. The maximum output current of the signal outputs is 10 mA.

2.2 Safety Consideration

The replacement of a device contributing to the safety of a plant makes a new safety consideration necessary. For this reason, the safety values of the consortium monitor must be replaced in the calculation by the new data of the safety basic monitor. If a contact extension is necessary, this must be included in the safety consideration. Furthermore, the manuals of the devices used must be observed.

2.3 Case Distinction

When replacing the consortium monitor with the safety basic monitor, various cases can occur. A distinction must be made between relay outputs and electronic outputs. If relay outputs are required, a contact extension with relay outputs must be used in addition to the basic safety monitor. When using a contact extension, a distinction must be made as to whether feedback already exists and can be used for indirect monitoring of the contact extension or whether a program change is required. If voltages greater than 30V are to be switched, a contact extension is required. When using the electronic outputs, it must be ensured that a maximum output current of 0.5 A is permissible. Furthermore, each electronic output has only one current path. If several channels per output switching element are required, a contact extension must be used. In addition to the cases already described, a number of special cases can occur. Figure 1. shows scenarios which can occur when replacing the consortium monitor.
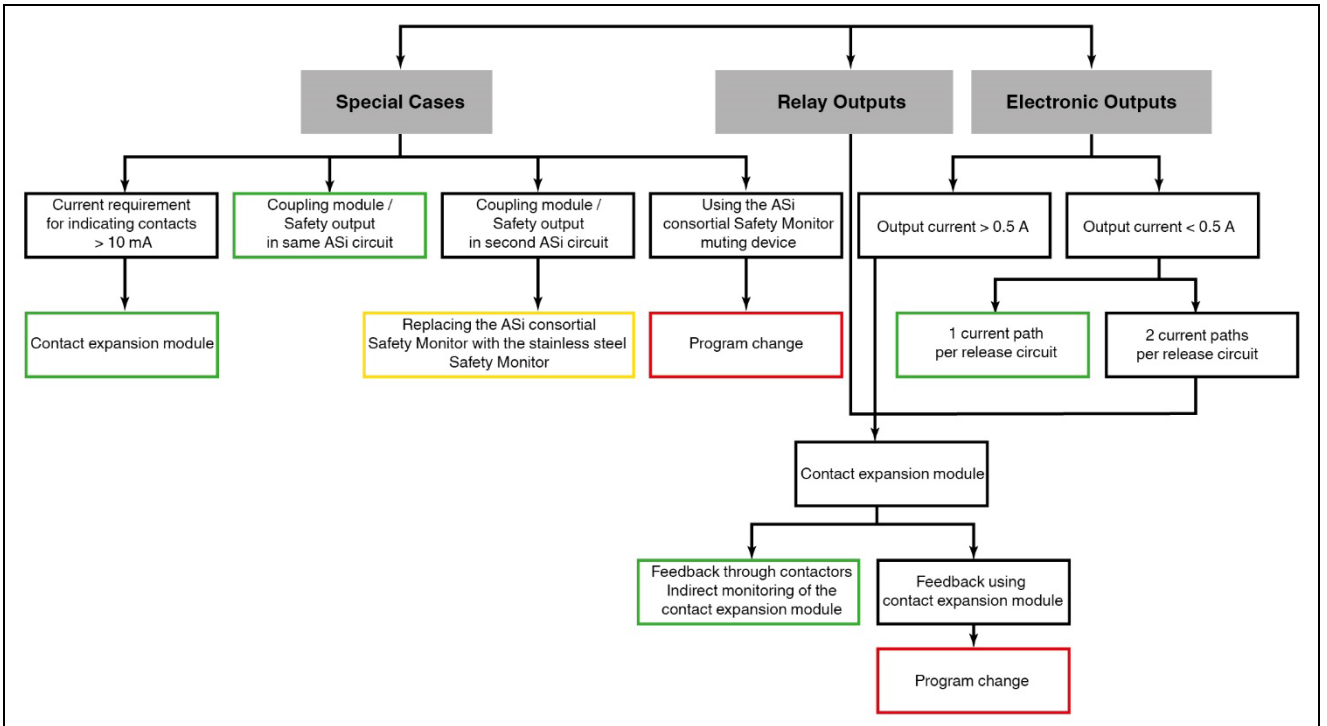
PEPPERL+FUCHS

Figure 1. Case Distinction

2.4 Connections

In addition to the functional properties, the location of the contacts on the devices is also important for the exchange. Figure 2. shows the contact assignment for the consortium monitor compared to the basic safety monitor.
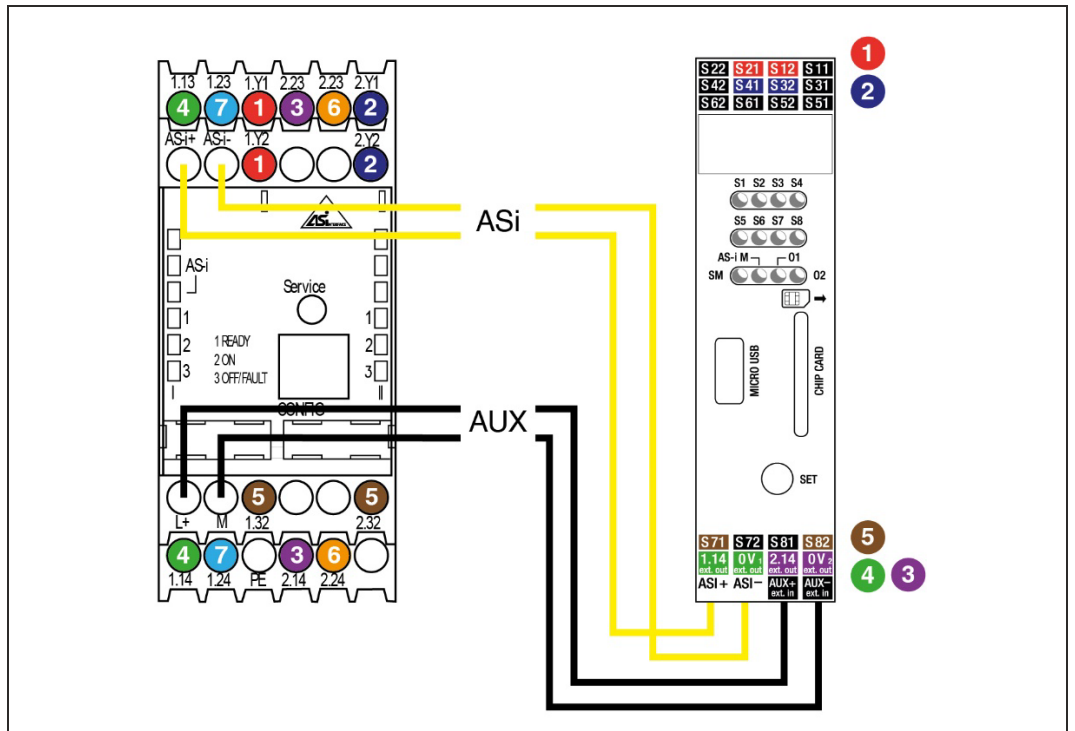

Figure 2. Contact assignment consortium monitor - safety basic monitor

PEPPERL+FUCHS

1	EDM/Start input output circuit 1
2	EDM/Start input Output circuit 2
3	Output switching element 1 Output circuit 2
4	Output switching element 1 Output circuit 1
5	Signal outputs
6	Output switching element 2 Output circuit 2
7	Output switching element 2 Output circuit 1

Assignment

Consortium Monitor	Safety Basic Monitor
1.Y1 (EDM 1)	S12
1.Y2 (Start 1)	S21
2.Y1 (EDM 2)	S32
2.Y2 (Start 2)	S41
1.32 (Signal output 1)	S71
2.32 (Signal output 2)	S82
1.13 (Switching element 1 - IN)	– [1]
1.14 (Switching element 1 - Out)	1.14 [1] 0V
2.13 (Switching element 1 - IN)	– [1]
2.14 (Switching element 1 - Out)	2.14 [1] 0V
L+ (Supply, 24V)	AUX+ ext in
M (Supply, 0V)	AUX- ext in
AS-i +	ASI +
AS-i -	ASI -

Table 1.

[1]   See connection examples

2.5 Direct Replacement

In this case, the consortium monitor is replaced by the safety basis monitor. The program of the old monitor is played unchanged into the safety basis monitor. In the example, two contactors are connected to the electronic outputs of the safety basic monitor (1.14 and 2.14). The feedback is made to the feedback inputs of the safety basic monitor (S12, S32). The start inputs (S41, S21) are used to realize a monitored start. The status of the two output switching elements is provided via the two signal outputs (S22, S42). The described situation is shown in figure 3.
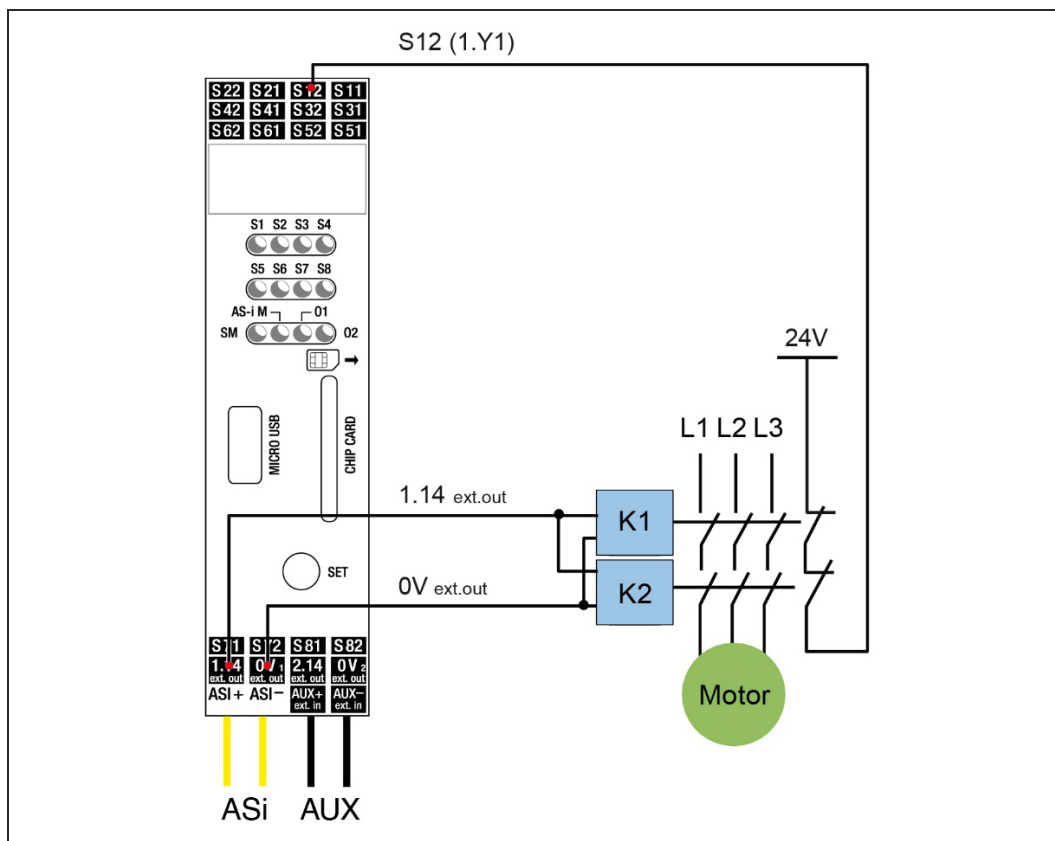
PEPPERL+FUCHS

Figure 3. Direct Replacement

2.6 Feedback via Contactors

In this case, the consortium monitor is replaced by the safety basic monitor. A contact extension is necessary to realize the required potential-free contacts. As already described in Figure 1. <Case Distinction>, a feedback to the safety monitor is available. The contact extension can be indirectly monitored via this feedback.

Figure 4 shows the control of a contactor by the safety basic monitor with the aid of a contact extension. As in the case of direct replacement, start inputs and signal outputs are available. The contact extension is connected to the electronic output 1.14. The feedback for monitoring the contactor is connected directly to the safety basic monitor (S22). With the use of the contact extension, the switching of loads greater than 0.5 A as well as greater than 30 V is possible.
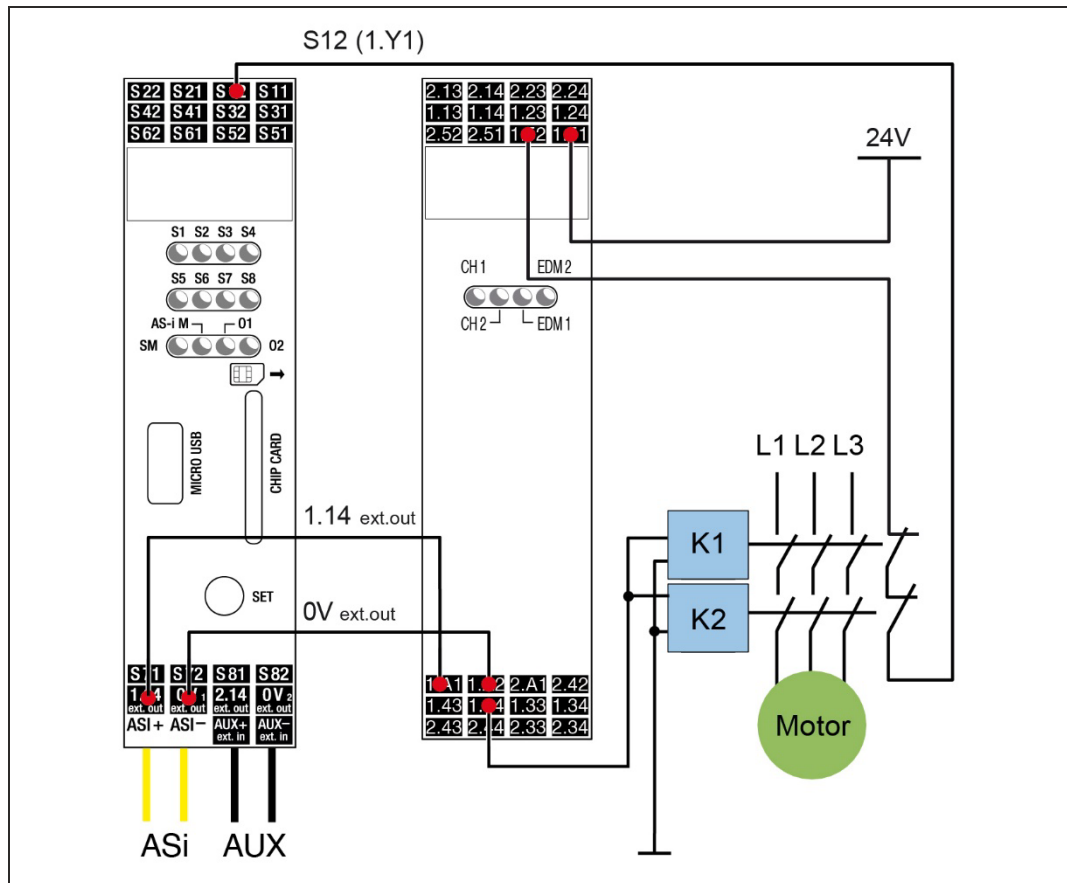
PEPPERL+FUCHS

Figure 4. Feedback via Contactors

2.7 Feedback via Contact Extensions

In this case, the consortium monitor is replaced by the safety basic monitor. For the realization of the required potential-free contacts, a contact extension is necessary. As already described in Figure 1. a contact extension is required in this case. However, there is no feedback to the safety monitor. This must be added for monitoring the contact expansion. In this case, an extension of the ASIMON program is required. See 3.4.

Figure 5 shows the control of a contactor by the safety basic monitor with the aid of a contact extension. As in the case of direct replacement, start inputs and signal outputs are available. The contact extension is connected to the electronic output 1.14. The feedback from the contact extension (1.52) is connected to the safety basic monitor (S22). With the use of the contact extension, switching of loads greater than 0.5 A and greater than 30 V is possible.
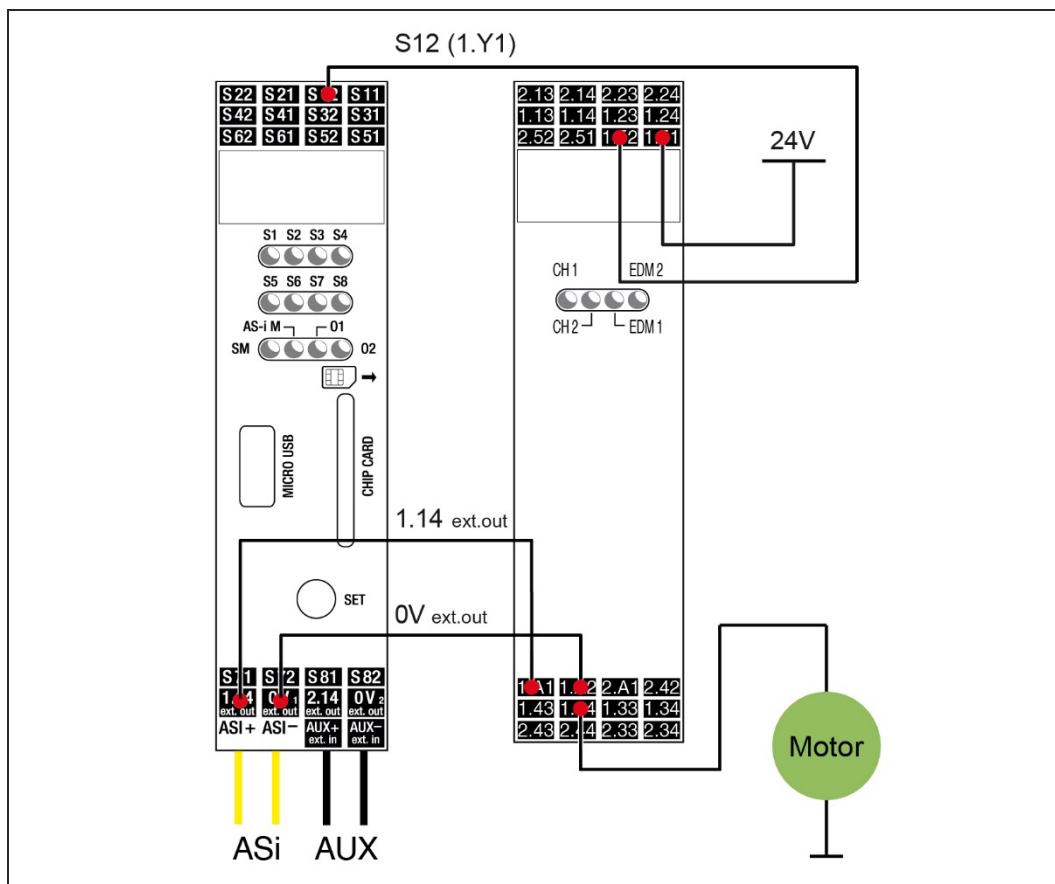
PEPPERL+FUCHS

Figure 5. Feedback via Contact Extensions

2.8 Special Cases

This chapter describes the special cases in which the exchange of the consortium monitor against the safety basic monitor is not possible, or involves a program change.

2.8.1 Use of the AS-i Output

The extended consortium monitor can switch a safe output in another AS-i circuit in parallel to one of its release circuits via the AS-iS connection. The functionality is provided by means of the safety basic monitor only for the first AS-i circuit. In this case the consortium monitor must be replaced by a 2nd generation safety monitor in stainless steel. This is briefly presented inUse chapter 4.

2.8.2 Use of the AS-i Coupling Module

The extended consortium monitor can switch a safe output in another AS-i circuit in parallel to one of its release circuits via the AS-iS connection. The functionality is provided by means of the safety basic monitor only for the first AS-i circuit. In this case the consortium monitor must be replaced by a 2nd generation safety monitor in stainless steel. This is briefly presented in chapter 4.

PEPPERL+FUCHS

2.8.3 Use of the Consortium Monitor Muting Device

When using the muting functionalities of the consortium monitor, it should be noted that these can also be implemented by the basic safety monitor. However, the muting module must be replaced and parameterized by the user in the safety program.

2.8.4 Current Requirements of the Signal Contacts > 10 mA

In the event that the current requirement of the signal contacts is > 10 mA, a contact extension must be used for the output switching element. Signal outputs with a current requirement greater than 10 mA can be connected to the contact extension.

3. Safety Program

After differentiating between the individual use cases, this chapter describes the procedure for replacing the software.

3.1 Transfer configuration from consortium monitor

In the first step, the software must be downloaded from the consortium monitor to be replaced. For this purpose, a connection to the consortium monitor must be established using the ASIMON software and the diagnostic cable. Figure 6 shows this procedure.

Figure 6.

After establishing the connection between the consortium monitor and the PC, open the ASIMON software. Use at least version 3.1.5.5.

PEPPERL+FUCHS

Click on „Set interface" under the „Monitor functions" menu item.

In the example shown in Figure 7, the diagnostic cable is connected to COM port 5 of the PC. After confirming the settings, a green bar appears at the bottom of the ASIMON window, indicating that a connection to the consortium monitor has been established.
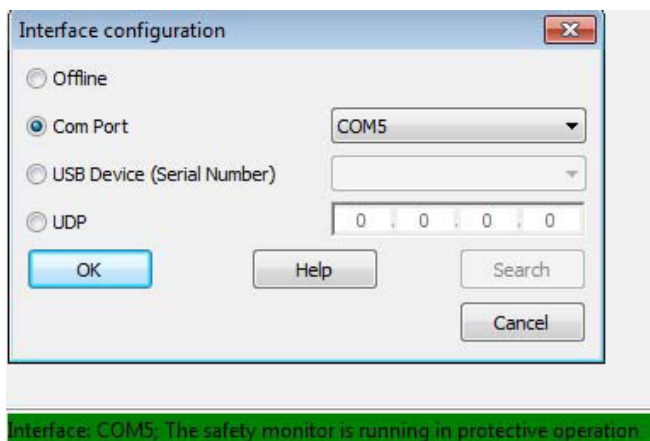

Figure 7.

As soon as communication with the consortium monitor is established, the configuration can be loaded from the consortium monitor.

■ Transfer the configuration to the PC via the „Start diagnostics" menu item.

Since there is no configuration stored in the ASIMON software, the appearing message must be confirmed with „Neutral". See Fig. 8.
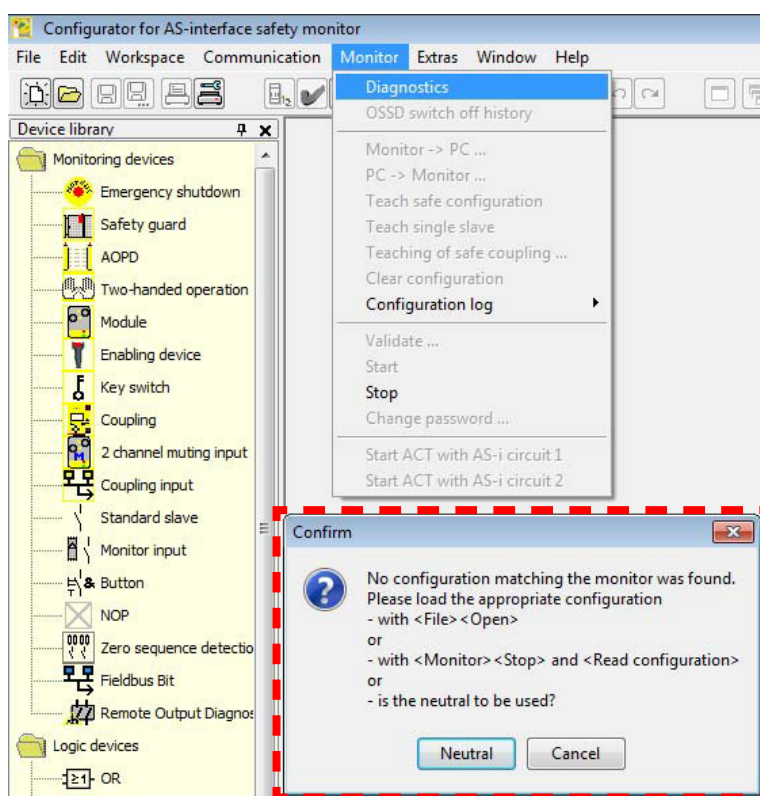

Figure 8.

PEPPERL+FUCHS

After confirming to use the neutral configuration, a progress bar appears at the bottom of the ASIMON window to indicate the status of configuration loading. As soon as the configuration is complete, the release circuit configuration appears. See Fig. 9.
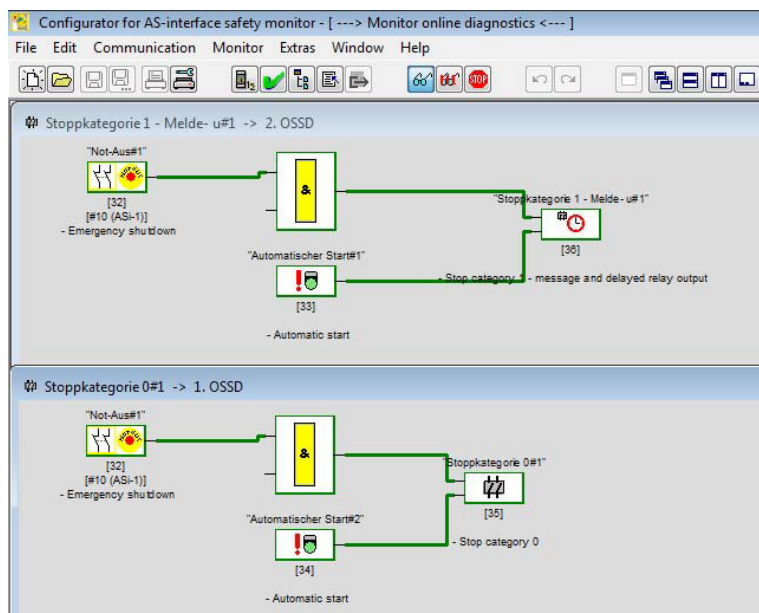

Figure 9   Rekease circuit configuration

After the configuration is transferred to the PC, it must be loaded into the Safety Basis Monitor. For the exchange of the consortium monitor without a program change, see chapter 3.2 in the next step. If the application requires a program change, continue with chapter 3.3. Only then is it sensible to transfer the configuration to the Safety Basis Monitor, as described in chapter 3.2.

3.2 Transfer configuration to safety basic monitor

The first step is to establish a connection between the PC and the safety base monitor. To establish a connection between the safety base monitor and the PC, please use the USB diagnostic cable provided for this purpose. This process is shown in Figure 10.

Figure 10. Transferring the configuration to the Safety Basic Monitor

PEPPERL+FUCHS

As soon as the safety base monitor is connected to the PC, the consortium monitor and the PC must be disconnected.

■ To do this, please remove the diagnostic cable from both the PC and the consortium monitor.
Please be sure to leave the ASIMON program open!

■ Confirm the error message that appears after the connection is interrupted with „Yes", see Figure 11.
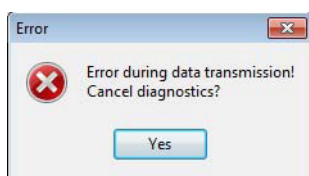

Figure 11. Data transmission error

In the next step, the Safety Basic Monitor must be connected to the AS-i network. It should be noted that from this point on the safety devices are switched off. It is best to disconnect the AS-i cable from the consortium monitor directly and connect it to the Safety Basic Monitor.

After the Safety Basic Monitor has been connected to the AS-i network, the setting for the communication interface must be adjusted in the ASIMON program.

■ To do this, select the menu item „Communication /Settings".

■ Choose USB as the connection type.

• Select the serial number from the list.
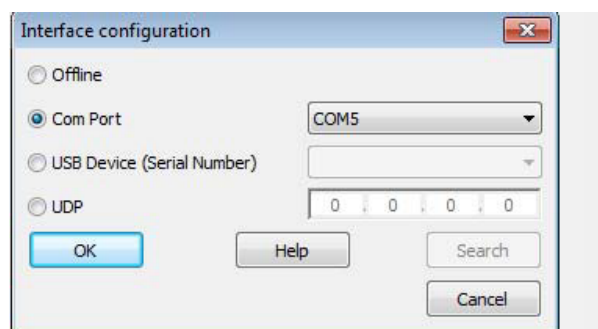
• These settings are shown in figure 12.

Figure 12.

After confirming the connection settings, a window appears with a warning stating that the configuration of the Safety Basic Monitor provides for an external power supply.

■ Confirm this message with „Ignore", as this setting will be deactivated after the configuration has been transferred.

Before the configuration can be transferred to the safety basic monitor, a device password must be set.

F PEPPERL+FUCHS

■ To do this, select the menu item „Monitor/Change password".

⇒ A window appears in which the current password and the password to be assigned must be entered.

With factory settings, the password is „SIMON". The change of the password must be confirmed with „OK".

In the next step, the configuration is uploaded to the Safety Basic Monitor.

■ To do this, select the menu item „Monitor/PC/Monitor" to transfer the configuration.

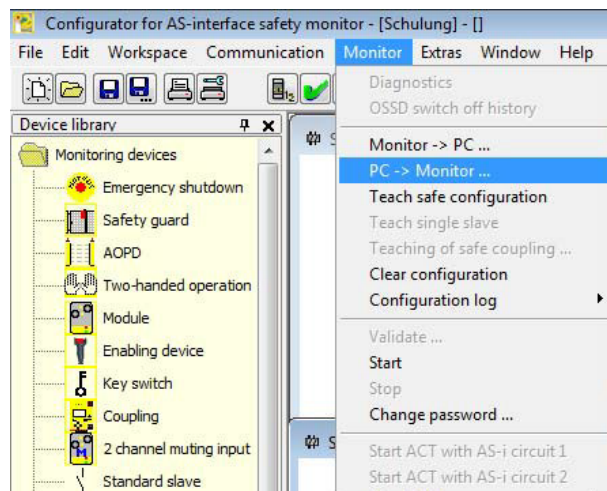⇒ This procedure is shown in Figure 13.

Figure 13.

While the configuration is being transferred, a window appears showing the progress of the transfer.

As soon as the configuration is transferred, the code sequences of the safe input modules must be transferred. A window appears asking whether the code sequences are to be taught in.

■ Please confirm this with „Yes".
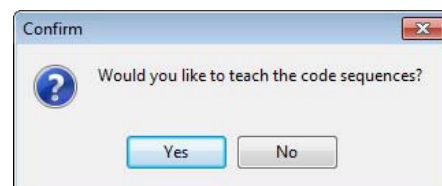
⇒ This procedure is shown in Figure 14.

Figure 14. „Program code sequences" prompt

The code sequences are transferred. The message „Teach-in completed successfully." follows

It must be ensured that all safe input modules are in a safe state. For this purpose, EMERGENCY STOP buttons must not be pressed and door switches must be closed and locked.

![PEPPERL+FUCHS]

After the code sequences have been taught in, a message appears stating that the safety protocol must be checked in order to carry out an activation.

■ Confirm this message with „OK" and check the security log.

In the next step, use the name and previously assigned password to confirm that the security protocol is being checked.

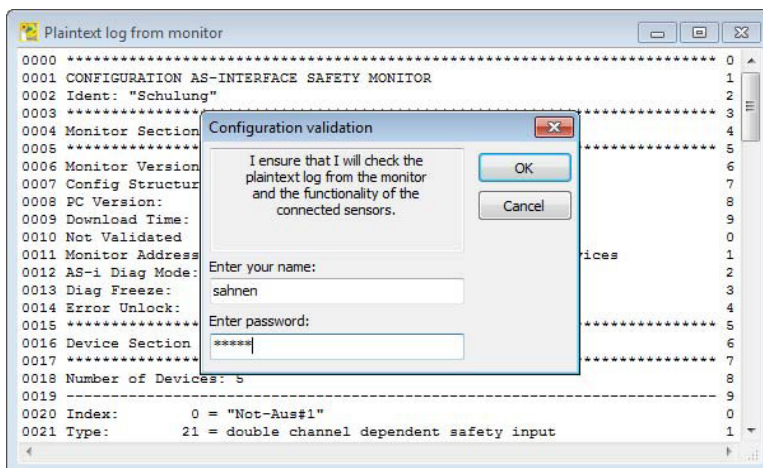■ Enter your name and password and confirm the information with „OK".

Figure 15. Releasing the configuration

In the last step, the safety basic monitor must be set to protective mode so that the safety program is activated.

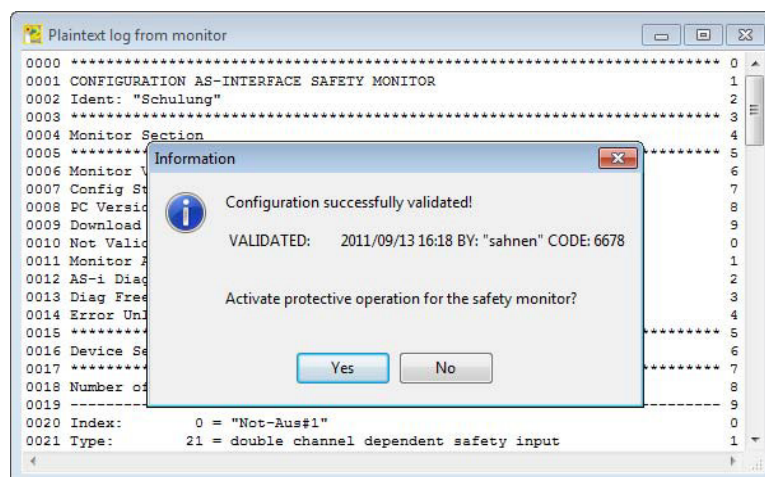■ Confirm the message with „Yes" as shown in Figure 16.

Figure 16.   Configuration successfully released

PEPPERL+FUCHS

⇒ After activation of the protective mode, the status of the OSSDs and all safe input and output modules appears in the ASIMON program, comparable to Figure 17
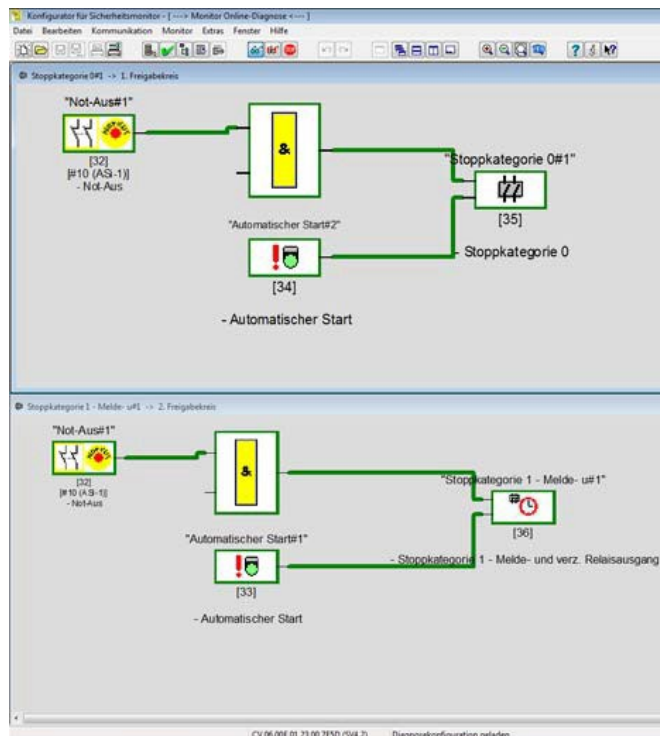

Figure 17. Status of release circuits

⚠️ **WARNING!**

To ensure the safety of the plant, a detailed test of all safety components must be carried out!

3.3 Projecting the Gateway

If more than one participant is simulated in the consortium monitor configuration, a re-projecting of the AS-i circuit in the gateway is necessary. The safety basis monitor uses a different participant profile for the second and third participant. The safety basis monitor can transmit diagnostic data to a gateway using the second and third simulated subscriber.

3.4 Safety Program Extension

This part of the documentation is only for the case when there is no feedback and a contact extension is required. It is important to note that the changes to the safety program can only be made after downloading the configuration from the consortium monitor.

PEPPERL+FUCHS

Adding the contact extension without previously existing feedback requires an extension of the safety program. In order to use the new feedback path, it must be added in the ASIMON. Figure 18. shows the icon for a feedback input.
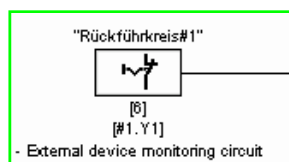

Figure 18. „Feedback input" icon

The feedback is a single standard signal that serves as an input condition for the stop category. Figure 19. shows the addition of feedback in an example program.
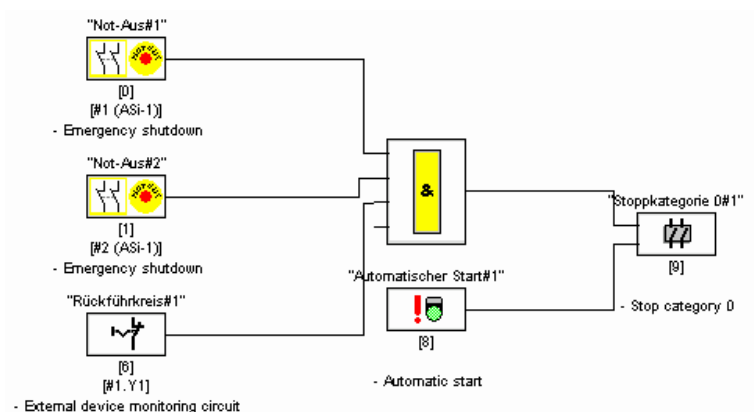

Figure 19. Adding the Feedback

In the settings for the feedback circuit, select the early feedback input intended for the respective output switching element.

■ Output switching element 1 (S12)

■ Output switching element 2 (S32)

As soon as the feedback loop is integrated into the safety program, you can continue with chapter 3.2.

4. Stainless Steel Safety Monitor

Figure 20.

The stainless steel safety monitor supports 2 AS-i circuits. As already described in the chapter 2.8 section, it is also possible to implement output and coupling modules in a second AS-i circuit. The safety monitor in the stainless steel housing can also realize all applications, which were previously realized by the consortium monitor.

The AS-i safety monitor in stainless steel housing is a safety switching device with 16 independent release circuits. With the help of the LCD display and the buttons, the safety monitor can be operated on site. The display is also used to show participant addresses and error messages. The AS-i monitor supports safe outputs so that sensor-based safety devices and other safety components up to category 4/Ple/ SIL 3 can be connected. Figure 27. shows the safety monitor.

For more information on the VAS-4A16L-K31 safety monitor, please refer to the website.

PEPPERL+FUCHS

Your automation, our passion.

Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
- Electrical Ex Equipment
- Purge and Pressurization
- Industrial HMI
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity

Pepperl+Fuchs Quality
Download our latest policy here:

www.pepperl-fuchs.com/quality

PEPPERL+FUCHS