

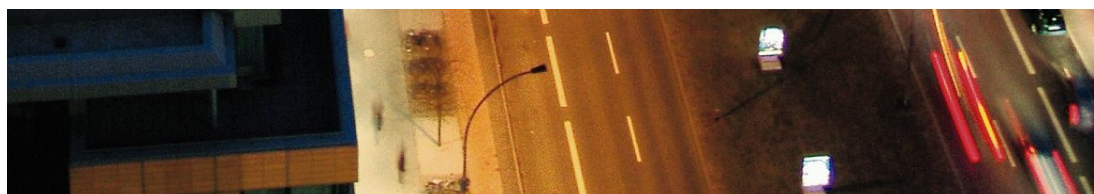


SiMo Test sX

Signal Monitoring Test - Description
A001

Intelligent Traffic Systems

SIEMENS



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1. Introduction

This document is intended to acquaint you with the signal monitoring test for the sX controller.

Scope of use

The signal monitoring test (hereinafter called the "SiMo test") is used to verify the function of the signal monitors of the sX system. The test is launched from a PC and the test procedure is logged in a PDF file that can subsequently be printed out.

Signal monitoring

The signal monitor is an integral part of the controller. Its primary task is to prevent electrical faults in the controller or the outdoor equipment from affecting the signaling in such a way as to constitute a hazard to traffic.

As you will know, the DIN/VDE 0832 standard and RiLSA, the directive governing traffic signal systems, decree that signaling states that are liable to represent a hazard to traffic must lead to the system being immediately switched off. Conversely, a system should not be switched off merely because it is in a (non-hazardous) fault state, because inactive traffic signal systems are in themselves a hazard.

Fault states

The controller's signal monitor recognizes and reports all fault states and assigns them to one of four categories:



Faults in the **outdoor installation** or the signal monitor's **hardware** or **software** may cause the system to be switched off (outdoor installation dark) and a message sent (fatal and emergency-off faults).

- Non-hazardous fault states such as the failure of a green lamp produce a fault message; the system continues to operate with no interruption (**secondary alarm**).

- Hazardous fault states cause the system to be switched off (the outdoor installation flashes to signal a fault) and a message sent (**primary alarm**).
- Faults in the outdoor installation or the signal monitor's hardware or software cause the entire system to be switched off. In this situation the outdoor installation is dark, while the LEDs and screen inside the controller remain operative (**system fault**).
- If the signal monitor detects that one or more signals remain active on a system that has been switched dark, then it actuates the fault-current switch (**emergency off fault**).

1.1. Performance features

- Manual test mode with logging
- Logging of all fault messages
- Semi-automatic test of lamp failures
- Automatic test of conflicts from the intergreen time matrix.

1.2. System requirements

There are no great requirements for hardware and software. Even the operating system (OS) is irrelevant as long as it supports an HTML5 browser.

It is possible to use the web service GUI for PCs, laptops, tablets or smartphones.

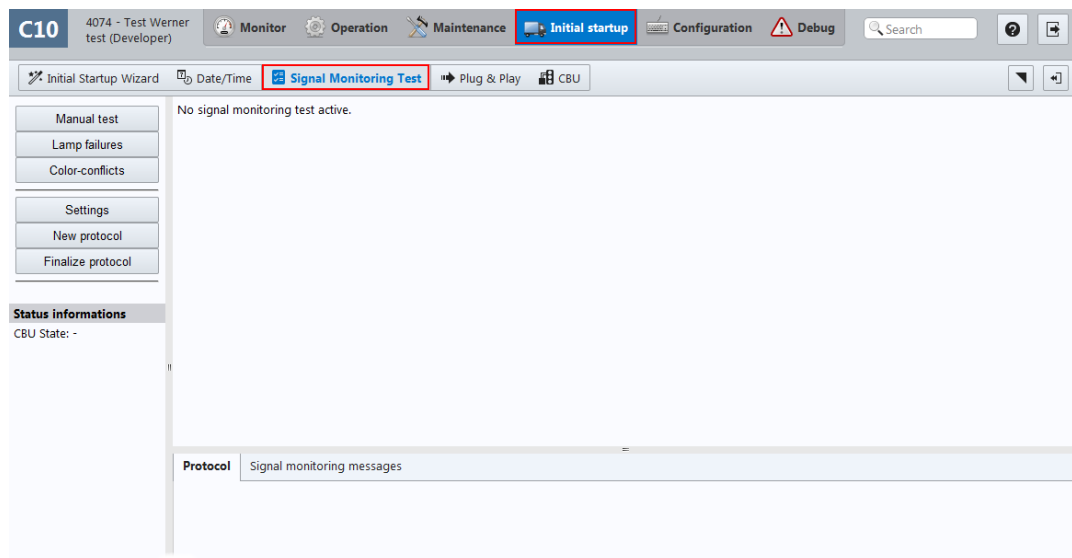
Please note that the Windows-native Internet Explorer does not support HTML5 but it is possible to install another browser.

- HTML5 web browser
- LAN adapter or wireless network adapter
- The settings for the Ethernet connection are to be configured.

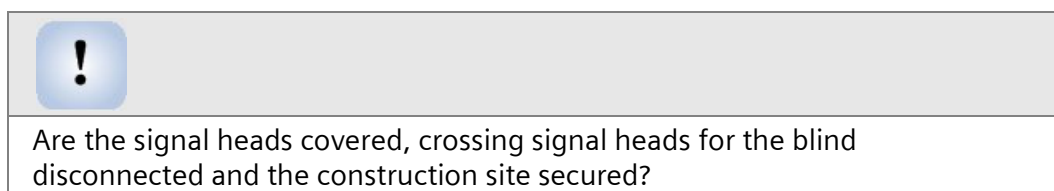
2. User interface

2.1. Main window

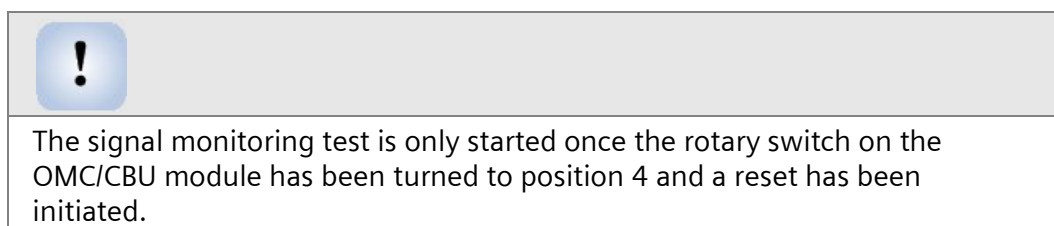
The main window of the signal monitoring test is shown after selecting the tab "Commissioning" and pressing the button "Signal monitoring test".



Before the main window is activated the following warning message must be confirmed.





By acknowledging this message the tester confirms that he or she has carried out all the prescribed and necessary security measures at the test system before activating it for signal monitoring test operation.



The following buttons are then available:

Button	Description
Manual test	You use this button to call up the dialog for operating the manual signal monitoring test.
Lamp failures	You use this button to call up the test dialog for the lamp test.
Color conflicts	You use this button to call up the test dialog for a test of specific color conflicts from the intergreen time matrix (ZZ matrix).
Settings	You use this button to call up the settings dialog for the signal monitoring test
New protocol	Deletes the current protocol
Finalize protocol	Terminates the current protocol and offers the option of saving it as a PDF file on the PC

The current CBU status is shown in the main window as follows:

Icon	Description
	OK, the controller is in a live state
	Shutdown, the controller failed due to a signal monitoring fault

3. Functions offered by the signal monitoring test

3.1. Protocol

- The protocol contains all relevant information about the controller and the version of signal monitor being used.
- All fault messages are logged as they are received.

3.1.1. Layout of the protocol information

During the signal monitoring test the log is displayed in the "Protocol" tab. The printout is not formatted until the log is stored.

Protocol					
Signal monitoring messages					
Color conflicts Conflict: green against dark					
Line	Triggered SG	Reported: int. SG # SG	Ext. SG # SG	Type /Identifier	Confl. /Res.
1	1 # 3	SI1: 1 # 3	K1 / K3	(p) Farbkonfliktfehler	Gn # Da/OK
2	1 # 4	SI1: 1 # 4	K1 / K4	(p) Farbkonfliktfehler	Gn # Da/OK
3	2 # 3	SI1: 2 # 3	K2 / K3	(p) Farbkonfliktfehler	Gn # Da/OK
4	2 # 4	SI1: 2 # 4	K2 / K4	(p) Farbkonfliktfehler	Gn # Da/OK
Activated conflicts: 4					



A log entry terminates with **OK** if the initiated test operation led to the expected result.

Example: A signal pattern is initiated with a green # dark conflict, SG 1 # SG4. As a result the controller switches of with a color conflict fault. The corresponding log entry is marked **OK** because this is the expected fault message.

3.1.2. Printout

- When the data is printed or stored the details of the controller are included in the log.
- Each page is given a header and footer containing the principal controller parameters.
- The first page contains all the relevant version information.

3.1.3. Contents of the log

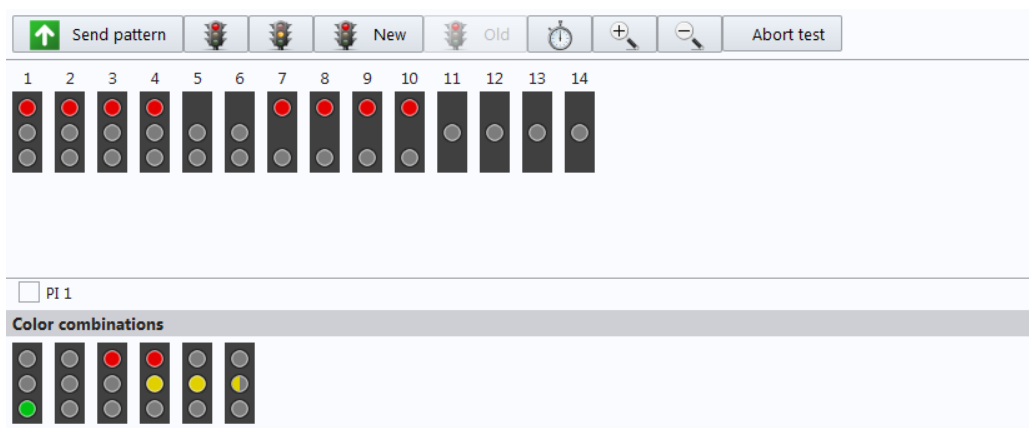
- Information about the current test
- Activated signal groups
- Reported signal group no.
- Error type
- Conflict checked against the expected conflict.

Column	Description
Activated SG	The signal groups that were activated for the test. The manual test always activates all the SGs.
reported: int. SG # SG	Logical numbers of the reported signal group
External SG # SG	Names of the reported signal groups.
Type / Designation	Type of alarm and designation.
Confl. / Res.	Conflict designation and status of the expected result. In the case of the manual test there cannot be an expected result.







3.2. Manual test



The manual test provides an interface that enables you to activate all the configured signal groups with the available color combinations.


- All the logical signal groups and their chambers are displayed
- The partial intersection assignment is displayed
- All the available color combinations are displayed





3.2.1. Buttons (icons) in the manual test

Icon	Name	Description
	Send pattern	Sends the current pattern to the controller Shortcut key s or right mouse button
	Set start pattern	Sets the specified start pattern and immediately sends it to the controller
	Set dark-flashing	Sets the provided dark-flashing pattern and sends it immediately to the controller
	Set current pattern as start pattern	Accepts the current pattern as the start pattern
	Set old pattern as start pattern	Sets up the configured "all red" pattern as the start pattern
	Set time monitors	Sets the time monitors in the manual test See the corresponding subentry "Set time monitors" for further information

Icon	Name	Description
	Enlarge signal group	Enlarges the depiction of the displayed signal groups
	Shrink signal groups	Reduces the depicted size of the displayed signal groups
Abort test	Terminate	Terminate the manual test



If a new start pattern is set via the button  **New** it is identified in the status information with the red-colored text "**Changed to all-red pattern**".

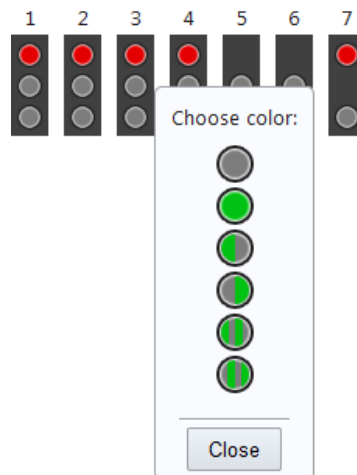
After pressing the button  **Old** the old start pattern is reset and the identifier deleted.

If the color-conflict test is started with the changed all-red pattern, this pattern is taken into consideration for the conflicts to be tested.


3.2.2. Setting signal patterns (sometimes called 'pictures')

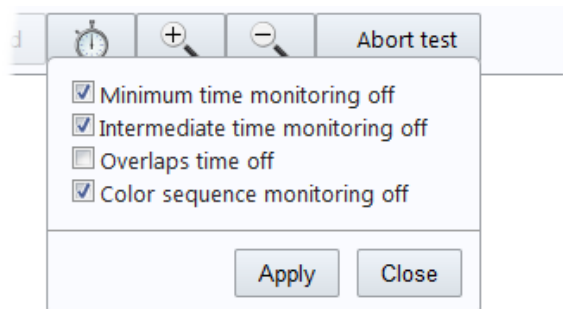
The desired color combination for a signal group can be set up in a number of ways:

- by clicking on the appropriate chambers
- by clicking on the signal group number to select one or more signal groups and clicking on the color combination to transfer it/them
- or by clicking on the button for a particular pattern (start pattern / dark-flashing)
- by clicking the right pop-up menu on a chamber.



3.2.3. Setting time monitoring

Clicking on the  button opens up a submenu in which you can set up appropriate time monitoring features. The currently active time settings are ticked.



The default setting that is set at the start of the signal monitoring test and when you start or leave the manual test can be modified under Settings (for more about this, see Settings).

Monitoring	Description
Min time monitoring off	Minimum time monitoring is turned off.
Intergreen time monitoring off	Intergreen time monitoring (ZZ) is turned off.
Overlapping time monitoring off	Overlapping time does not elapse; overlapping time fault is issued immediately. Overlapping time ON (checkbox not active); the overlapping time first elapses and then the overlapping fault is issued.
Sequence color monitoring off	Color sequence monitoring is turned off.

3.2.4. Logging


All the signal groups that are not showing the start pattern are recorded in the log (protocol) as soon as the pattern has been sent to the controller. Any faults occurring are also recorded as appropriate.



In the case of the manual test, fault messages are always reported as though all the SGs were addressed. The fault message is not evaluated.

3.3. Lamp failures

The lamp test logs lamp failures; this is done by activating lamp monitoring and initiating all the configured lamp failures.

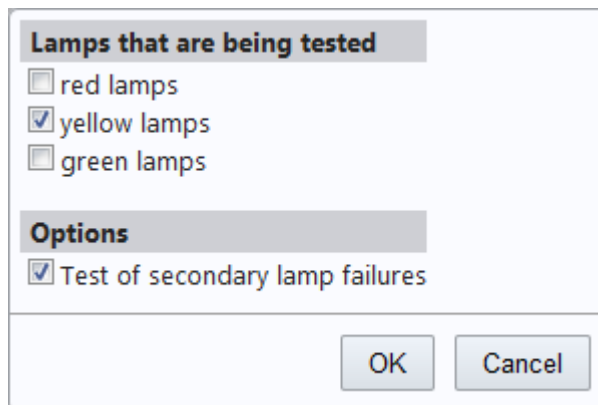


Failures for which a signal pattern cannot be automatically initiated will have to be tested manually afterwards. This is noted accordingly in the log.

The signal monitoring test switches the system to the all-red pattern and either prompts the user to generate lamp failures. This is done by switching to a signal pattern that includes the lamp that is to be tested. If the signal pattern leads to an impermissible state, then the lamp will have to be tested subsequently by hand.

The lamp failures are generated by interruption of the power circuit.

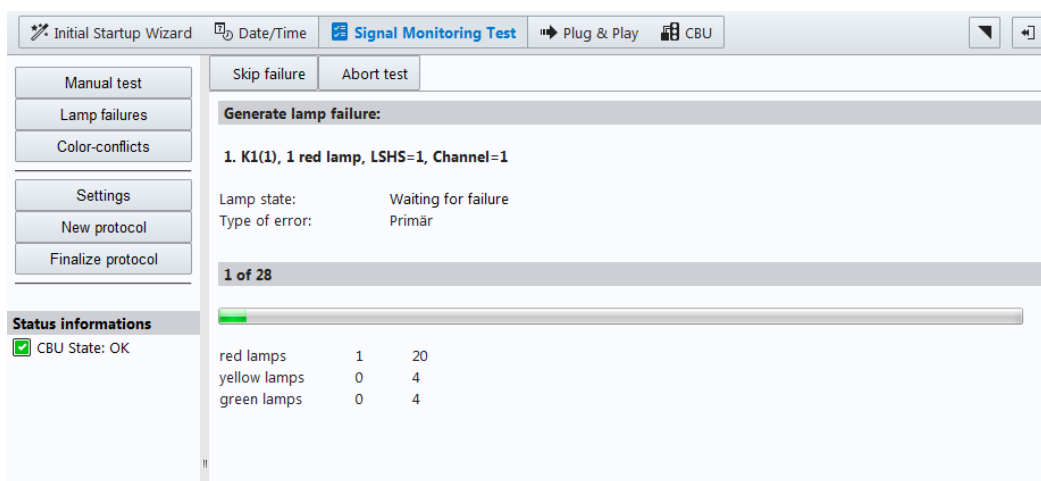
Before starting the test you will need to configure it:



The following additional configuration options are available for these tests:

- As well as red lamps this test can also check yellow ('amber') and green lamps.
- You can also initiate and log all types of secondary lamp failures (button: Check secondary lamps)

The lamp failure currently being tested is shown in the test window:



i

The lamp failure to be tested can be skipped by pressing the "Skip failure" button; this failure is then entered into the log with the message "not tested".

The test can be terminated at any time using the "Abort test" button.

3.4. Color conflicts

The signal monitoring test works through the intergreen time matrix (ZZ matrix) and initiates all the conflicts specified by RiLSA.

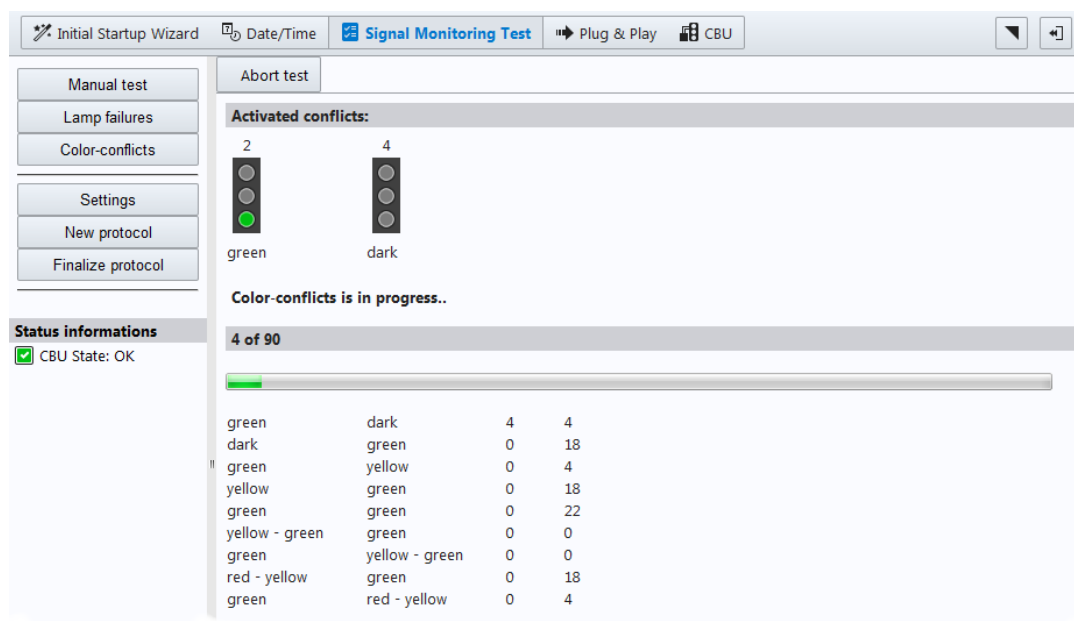
The following conflicts become activated:

- Green against dark
- Dark against green
- Green against yellow
- Yellow against green
- Green against green
- Yellow-green against green
- Green against yellow-green
- Red-yellow against green
- Green against red-yellow



The conflicts are tested as specified in the intergreen time matrix for which the chambers and color combinations are configured for the corresponding signal group.

The activated conflict is displayed in the test window:



Conflicts with overlaps are removed from the test with a corresponding note in the log.

The test can be terminated at any time using the "Abort test" button.

More information
is available from:

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The information in this guide contains
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