

Diagnostic Software

TITANUS *TOP-SENS*[®] Rev.a

Step by Step Guide

WAGNER
Alarm- und Sicherungssysteme GmbH
Schleswigstraße 5
D-30853 Langenhagen

Represented in the United Kingdom by WAGNER UK Limited

Telephone: + 44 / 870 / 333-6116
Telefax: + 44 / 870 / 333-4544
e-mail: support@wagner-uk.com
internet: www.wagner-uk.com

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1 States module

1.1 Air flow indicator

The air flow measuring value of the detector module is shown by a bar-graph and percentages. When operating a detector module without air flow monitor the "Air flow" field is blanked-out.

The current air flow value is indicated by the blue marker on the bargraph. Below this graph, the value is shown in percentages. 0% equals the air flow at the time of adjustment. If the air flow value varies by $\pm 100\%$ or more a fault is indicated. The blue marker is then outside the permissible range which is marked yellow on the bar-graph. Small variations from the nominal value are permissible. They can be caused by temperature changes, or changes of air pressure/humidity compared with that at the time of adjustment.

If the discrepancy is positive, the air flow has increased. This points to pipe damage (breaks, tears, dissolved glued connections) or enlarged (loose) sampling points.

If the discrepancy is negative, the air flow has decreased. This could be caused by blocked sampling points, impurities in the pipe or a soiled air filter.

1.2 Detector state indicator (current air and detector pollution)

The indicator shows the pollution of the detector module, i.e. the sampled air, and is shown in a bar-graph and by percentages. 0% equals the "new" condition in clean surround air. The blue marker shows the current detector condition. If it leaves the yellow area (discrepancy at least $\pm 100\%$) a fault is indicated.

A positive discrepancy indicates pollution (e.g. dust) in the sampled air. This can be remedied with an air filter or, if possible, by switching to a lower sensitivity. Soil deposits inside the module also raise the value.

A negative discrepancy is caused by diminishing light from the optics inside the detector module. Reasons for this could be an aging light source or pollution in the optics.

2 Fault messages

2.1 Mainboard: Communication error

Where a communication fault has occurred on the base board which has at least one detector module.

To correct this, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Base board is defective	<ul style="list-style-type: none"> - Make sure device is current-free. - Pull off cable connecting detector module and base board. - Switch on power and run device for 5 minutes. <p>If the fault persists the base board is defective.</p> <p><u>Note:</u> If there is no detector module the fault indicator "Detector module: Communication error" (see 2.8) lights up.</p>	Replace base board
2	Connection cable between base board and detector module is defective	<ul style="list-style-type: none"> - Make sure device is current-free. - Connect cable of 1st detector module with base board. Don't clip down the detector module. - Switch on power and run device for 5 minutes. <p>If the fault persists, the connecting cable between base board and detector module is defective (short circuit).</p> <p><u>Note:</u> If there is no detector module the fault indicator "Detector module: Communication error" (see 2.8) lights up.</p> <p>If there are two detector modules, repeat the procedure.</p>	Replace connection cable
3	Detector module is defective	<ul style="list-style-type: none"> - Make sure the device is current-free. - Connect the cable of the 1st detector module with base board. - Switch on power and run device for 5 minutes. <p>If the fault persists the detector module is defective.</p> <p><u>Note:</u> Also, the fault indicator "Detector module: Communication error" (see 2.8) might light up.</p> <p>If there are two detector modules repeat the procedure.</p>	Replace detector module
4	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.2 Mainboard: Collective fault

To correct a fault the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Potentiometer R3 setting for pressure-dependent air flow adjustment is incorrect	<ul style="list-style-type: none"> - Measure the voltage (DC) on the measuring points MP2 (+) and MP3 (-) of the base board with a multi-meter. <p>The voltage standard is 1.2 V. Variations might occur due to pressure-dependent adjustments of the air flow.</p> <p>If the measured voltage lies outside the range of 0.5V and 1.9V, the setting is incorrect.</p> <p><u>Note:</u> A fault occurs at voltages lower than 0.2V or higher than 2.2V.</p>	<p>Re-set the voltage between the two measuring points MP2 (+) and MP3 (-) with the potentiometer R3.</p> <ul style="list-style-type: none"> - Air pressure-independent adjustment: 1.2 V - Air pressure-dependent adjustment: according to manual (air pressure correction table in enclosure) <p>Further information see TITANUS TOP·SENS® manual, chapter 7.1.</p>
2	Base board is defective	<ul style="list-style-type: none"> - Make sure the device is current-free and then switch on again. <p>If the fault occurs right after switch-on, the base board is defective. If a fault registers at the earliest after 45 seconds of re-start, continue as follows.</p> <ul style="list-style-type: none"> - Make sure the device is current-free. - Disconnect ventilation cable from base board. - Switch on power and run device for 5 minutes. <p>If the fault persists, the base board is defective.</p> <p><u>Note:</u> When re-connecting the ventilator, make sure the polarity is correct (1– red, 2 – black).</p>	Replace base board
3	Ventilation connection is depolarised	<p>As the ventilator has stopped, a fault of the detector module "Air flow controller at its limit" and "Air flow too small" lights up.</p> <ul style="list-style-type: none"> - Make sure the device is current-free. - Disconnect ventilation cable from base board. - Switch on power and run device for 5 minutes. <p>If the collective fault does not recur, the connection to the ventilator is probably defective.</p>	Inspect ventilator connection to base board (red - cl. 1; black - cl. 2)

4	Ventilator faulty or blocked	<p>Diagnosis in step 3 points to a depolarisation of the ventilator connection. The connection itself is correct.</p> <ul style="list-style-type: none"> - Measure the ventilator voltage (DC) of the connected ventilator with a multi-meter. <p>If the ventilator voltage lies outside the limits listed below, it must be assumed that the ventilator is defective.</p> <p>Set ventilator voltage 6.9 V: Max. 7.6 V Min. 6 V</p> <p>Set ventilator voltage 9 V : Max. 10V Min. 7.8 V</p>	The ventilator cannot be removed from the housing. Therefore, the complete housing must be replaced.
5	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.3 Mainboard: Cut off fault

This fault can only occur if TITANUS TOP·SENS® is operated with a cut-off board.

To correct this, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Mesaures
1	Cut-off line faulty (short circuit or interruption)	<ul style="list-style-type: none"> - Measure the voltage (DC) on the clamp of the cut-off line with a multi-meter. <p>The voltage must lie between 0.7V and 12V.</p>	Check the cut-off line and correct short circuit or interruption.
2	Base board defective	<ul style="list-style-type: none"> - Make sure the device is current-free. - Pull off connection cable between cut-off board and base board. - Switch on power and run device for 5 minutes. <p>If the base board is defective, a fault is indicated once more.</p>	Replace defective base board
3	Connection cable between cut-off board and base board defective	<ul style="list-style-type: none"> - Make sure the device is current-free. - Pull off connection cable from both boards. - Test the connection cable for interruption or short circuit with a multi-meter (continuity test). <p>The fault could be caused by a measured wire break or short circuit.</p>	Replace defective connection cable
4	Cut-off board defective	<ul style="list-style-type: none"> - The cut-off line is not faulty. - Replace cut-off board. - Switch on power and run device for 5 minutes. <p>There should now be no fault if the cut-off board is the cause.</p>	Replace the defective cut-off board
5	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.4 Detector module: Detector module defective

To correct the fault, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Air flow speed is too low <u>Note:</u> Occurs only when using a detector module with air flow monitor.	If a fault occurs together with the fault "Air flow controller at its limit" (see 2.9), first check whether the fault can be attributed to the pipe system or the device. - To do this separate the pipe system from the device and connect a test pipe. - Only close off the 4.6mm opening in the test pipe and make the adjustment for the air flow. If no fault registers, the defect lies in the pipe system or its design. <u>Note:</u> The air flow speed in a sampling pipe with an outer diameter of 25mm must be at least 1m/sec. If necessary, the speed must be measured with a suitable measuring device.	Inspect the pipe system (especially for blockages). Check for blocked air filters or closed ball valves. Check the pipe system design.
2	Detector module is defective	If the fault occurs on its own, the detector module is defective. The detector module is also defective if the fault "Air flow controller at its limit" occurs while operating TITANUS TOP·SENS® with the test pipe.	Replace detector module
3	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.5 Detector module: Program fault

To correct the fault, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Detector module defective	- Make sure the device is current-free. - Replace detector module. - Switch on power and run device for 5 minutes. If the detector module was the cause of the fault, this is now corrected.	Replace detector module
2	External adverse influences	- Check surroundings for adverse influences. - Operate the device for a time in different surroundings. If the fault does not recur, it can be assumed that external influences at the original location are to blame.	If possible: Avoid external fault sources or instal device in a better location.
3	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.6 Detector module: Detector module dusty

To correct the fault, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Contamination of the surround air too heavy	<p>Detector module and sampled air are monitored for soiling/contamination.</p> <p>The bar-graph "Detector state" in the register "States module x" points to a greater contamination in the surround air or a soiled detector module. If the contamination is too heavy, the bar-graph exceeds the "max" (+100%) mark.</p> <ul style="list-style-type: none"> - To determine contaminated air as the cause, the module has to be tested temporarily in rooms with clean air. If this is not possible, the ventilator can be disconnected temporarily from the base board – no further dirt particles can now get to the detector module. <p><u>Attention:</u> A smoke detection within the supervision area of the device is not possible if the ventilator is disconnected!</p> <p>If the bar-graph begins to fall after a time, the fault is caused by the contaminated air.</p>	<p>By using an air filter in the pipe system, the burden on the detector module can be reduced.</p> <p>If possible: By switching to a lower sensitivity, the detector module can cope with greater contamination.</p>
2	Detector module soiled	If the fault persists after the measures taken in step 1, the module is soiled.	Replace the detector module
3	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.7 Detector module: Air pressure out of range / potentiometer

To correct the fault, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Potentiometer R3 setting for adjustment of pressure-dependent air flow is incorrect.	<p>A fault occurs together with the "Collective fault" of the base board. If two detector modules are used, the fault registers for both modules.</p> <ul style="list-style-type: none"> - Measure the voltage (DC) on the measuring points MP2 (+) and MP3 (-) with a multi meter. - The voltage standard is 1.2 V. Variations might occur due to pressure-dependent adjustments of the air flow. - If the measured voltage lies outside the range of 0.5V and 1.9V, the setting is incorrect. <p><u>Note:</u> Fault occurs at voltages lower than 0.2V or higher than 2.2V.</p>	<p>Re-set the voltage between the two measuring points MP2 (+) and MP3 (-) with the potentiometer R3.</p> <ul style="list-style-type: none"> - Air pressure-independent adjustment: 1.2 V - Air pressure-dependent adjustment: according to manual (air pressure correction table in enclosure) <p>Further information see TITANUS TOP·SENS® manual, chapter 7.1.</p>

2	Base board is defective	<p>The voltage cannot be adjusted in step 1:</p> <ul style="list-style-type: none"> - Make sure the device is current-free. - Pull off cable connecting detector module and base board. - Switch on power and run device for 5 minutes. <p>The base board is defective if the voltage on MP2 and MP3 cannot be properly adjusted with the potentiometer R3.</p> <p><u>Note:</u> If there is no detector module the fault indicator "Detector module: Communication error" (see 2.8) lights up.</p>	Replace base board
3	Connection cable defective	<ul style="list-style-type: none"> - Make sure the device is current-free. - Connect cable of 1st detector module with base board. Don't clip down the module. - Switch on power and run device for 5 minutes. <p>If the fault persists, the connecting cable between base board and detector module is defective.</p> <p><u>Note:</u> If there is no detector module the fault indicator "Detector module: Communication error" (see 2.8) lights up.</p> <p>If there are two detector modules repeat the procedure.</p>	Replace connection cable
4	Detector module defective	<ul style="list-style-type: none"> - Make sure the device is current-free. - Connect cable of 1st detector module with base board. Don't clip down the module. - Switch on power and run device for 5 minutes. <p>If the fault persists the detector module is defective.</p> <p><u>Note:</u> During operation with a defective detector module the fault "Detector module: Communication error" (see 2.8) might light up.</p> <p>If there are two detector modules repeat the procedure.</p>	Replace detector module
5	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.8 Detector module: Communication error

If the fault occurs in connection with other communication faults (base board, other detector modules) proceed as for “Base Board: Communication error” (see 2.1).

To correct the fault, the following steps must be taken in sequence:

Step	Possible cause	Diagnosis	Measures
1	Wrong detector module installed	Communication error activated: - Ensure that the correct detector module for TITANUS TOP·SENS®/a is installed.	The detector module for TITANUS TOP·SENS®/a must be exchanged.
2	Connection cable between base board and detector module is defective	Only one communication fault is activated: - Make sure device is current-free. - Replace connection cable. - Switch on power and run device for 5 minutes. If the fault does not recur, the connection cable was defective.	Replace defective connection cable
3	Detector module is defective	The fault persists after replacing the cable in step 2: - Make sure the device is current-free. - Replace detector module. - Switch on power and run device for 5 minutes. If the detector module was defective, the fault is corrected.	Replace defective detector module
4	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.9 Detector module: Air flow controller at its limit

This fault occurs only in detector modules with air flow monitor.

To correct it, the following steps must be taken in sequence:

Step	Possible Cause	Diagnosis	Measures
1	Air flow speed is too low	Check whether the fault is caused in the pipe system or the device: - Disconnect the pipe system from the device and attach a test pipe. - Close only the 4.6mm hole in the test pipe and make the adjustment for the air flow. Details are in the manual for TITANUS TOP·SENS®. If the fault does not recur, the pipe system and its design must be inspected. <u>Note:</u> The air flow speed in a sampling pipe with an outer diameter of 25mm must be at least 1m/sec. If necessary, the speed must be measured with a suitable measuring device.	Inspect the pipe system (especially for blockages). Also check for blocked air filters or closed ball valves. Check the pipe system design for correct use of air flow reducers.
2	Detector module is defective	If the fault persists in step 1 while connected to the test pipe, the detector module is defective.	Replace detector module
3	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.10 Detector module: Air flow too small

This fault occurs only in detector modules with air flow monitor.

To correct it, the following steps must be taken in sequence:

Active Fault Signal:

Step	Possible Cause	Diagnosis	Measures
1	Blockages in the pipe system	The air flow has fallen below the bottom fault-threshold. This is indicated on the "States module" register of the relevant module. The blue marker in the air flow bar-graph lies below the yellow area during an active fault. Additionally, this fault shows on the detector module LED in flash code. If the LED flashes twice every two seconds, the air flow is too little.	The pipes and air sampling points must be checked for blockages and blown through, if necessary. Check for blocked air filters or closed ball valves. Check that the correct air flow reducers are being used and the TITANUS TOP-SENS® ventilator blows air through freely.
2	Detector module is defective	If the fault persists after cleaning the pipe system, the detector module is the cause.	Replace the detector module
3	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

Saved Fault Signal:

Step	Possible Cause	Diagnosis	Measures
1	Setting for fault threshold or fault delay	External influences (e.g. air pressure variations, temperature or humidity) may lead to changes in the air flow. If the sensitivity of the air flow monitor is too high, adverse environmental influences can cause a temporary fall below the fault threshold.	Carry out the air pressure-dependent adjustment for high sensitivity of the air flow monitor (see manual TITANUS TOP-SENS® (chapter 7.1)). During adjustment, the pipe system must be inspected thoroughly. If possible, select a lower sensitivity of the air flow monitor or longer fault delay.
2	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

2.11 Detector module: Air flow too large

This fault occurs only in detector modules with air flow monitor.

To correct it, the following steps must be taken in sequence:

Active Fault Signal:

Step	Possible Cause	Diagnosis	Measures
1	Break of a pipe or loose aspiration-reducing film sheet	The air flow has exceeded the upper fault threshold. This is indicated on the "States module" register of the relevant module. The blue marker in the air flow bar-graph lies above the yellow area. Additionally, this fault shows on the detector module LED in flash code. If the LED flashes three times every two seconds, the air flow is too great.	The pipe system must be checked for damage (breaks, tears, glued connections). Check for damaged or loose aspiration-reducing film sheets.
2	Detector module is defective	If there is no fault in the pipe system, the detector module is the cause.	Replace detector module
3	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

Saved Fault Signal:

Step	Possible Cause	Diagnosis	Measures
1	Setting for fault threshold or fault delay	External influences (e.g. air pressure variations, temperature or humidity) may lead to changes in the air flow. If the sensitivity of the air flow monitor is too high, adverse environmental influences can cause a temporary rise above the fault threshold.	Carry out the air pressure-dependent adjustment for high sensitivity of the air flow monitor (see manual TITANUS TOP·SENS® (chapter 7.1). During adjustment, the pipe system must be inspected thoroughly. If possible, select a lower sensitivity of the air flow monitor or longer fault delay.
2	If the fault cannot be corrected after carrying out the above steps, save the latest diagnostic. Contact WAGNER , giving the fault description and diagnostic data.		

3 Settings module

3.1 Flash code diagnosis LED

The diagnosis LED on the detector module shows the actual condition of the module. It is an additional aid to the fault-finding data of diagnostic software. The table shows the flash code:

Flash Codes of Diagnostic LED on Detector Module	
Amount	Meaning
1 x flash	Airflow – Init active
2 x flashes	Airflow – too little (blockage)
3 x flashes	Airflow – too great (break)
4 x flashes	Software - Init
Constantly lit	Detector module defective

3.2 Settings of the DIL switch


In the register “Settings module“, the current settings for the detector module are shown.

The settings of the DIL switches on the detector module are indicated:

red – OFF (O)

green – ON (X)

The following table shows the possible settings.



Standard-Setting: *)

X	O	Z								X
O	X	X	X	X	X	X	X	X	X	O
	1	2	3	4	5	6	7	8	9	0

Sensitivity	1	2								
1/1 Nominal-sensitivity (e.g. 0,25%/m) (standard) *)	O	O								
1/2 Nominal-sensitivity (e.g. 0,5%/m)	X	O								
1/4 Nominal-sensitivity (e.g. 1%/m) (standard) ..	O	X								
1/8 Nominal-sensitivity (e.g. 2%/m)	X	X								
Alarm delay			3	4						
0 s			O	O						
10 s (standard)			X	O						
30 s			O	X						
60 s			X	X						
Air flow range					5	6				
small					X	O				
medium					O	X				
large (standard)					O	O				
very large					X	X				
Fault delay							7	8		
30 s							O	X		
2 min (standard)							X	O		
15 min							X	X		
60 min							O	O		
Fault latched									9	
Off									O	
On (standard)									X	
LOGIC-SENS										10
Off										O
On (standard)										X

*) Standard for detector-modules DM-TT-80: 1=OFF, 2=OFF