

ALARM INTERFACE

SAI-01



SINCLAIR ALARM INTERFACE UNIT

SAI-01

FOCUS PLUS SERIES

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INTRODUCTION

The SAI-01 interface unit indicates the state of the FOCUS PLUS wall-mounted air conditioner (ASH-09BIF2, ASH-13BIF2, ASH-18BIF2, ASH-24BIF2) by monitoring the communication between the indoor and outdoor air conditioner units. The interface unit indicates the state by flashing the LEDs and switching the relays. According to the settings, the indicated states can be: errors, limitations and general errors of the A/C system, additionally switched-on system, compressor running, cooling activated.

SAFETY INSTRUCTIONS

WARNING



Please read this manual carefully before installing this device!

- This manual is a part of the product and must be kept near the device to be available for easy reference.
- This device is not intended to be used for other purposes than those described below.
- Before starting operation, please check the range of operating conditions of the given installation.
- The SAI-01 alarm interface unit may be installed only by a company that has the relevant qualification and is authorized by the manufacturer.
- This device is designed for mounting on a DIN rail in a dry and dust-free environment. Do not allow the water to get into the electrical components; there is a risk of electric shock or damage to the unit.
- Do not allow persons without the necessary qualification, and especially children, to manipulate the device.
- Cleaning and maintenance may only be performed by persons with a suitable qualification. Otherwise, personal injury or property damage may occur. Do not dismantle or repair the device.
- Disconnect the device from the power supply before cleaning or maintenance. Otherwise, an electric shock may occur.
- Do not touch the device with wet hands, do not operate it in a wet environment and do not wash it with water. There is a risk of electric shock.
- Damaged power cables must be replaced by the manufacturer, authorized service centre or appropriately qualified person.
- Do not repair the device yourself. Otherwise, electric shock or damage to the device may occur. Contact your dealer, if you need to repair the device.
- Immediately turn off the device and disconnect it from the power supply, if any of the following conditions occur. Then ask your dealer or an authorized service centre for repair. If you let the device running under these conditions, this may cause a malfunction, electric shock or fire.
 - The power cord is overheated or damaged.
 - An abnormal noise during operation.
 - An upstream breaker repeatedly trips.
 - The device smells like something is burning.
- Ensure that the wires for sensors, load and power supply are led separately and far enough from each other, without crossing or parallel leading.

APPEARANCE AND DIMENSIONS

The SAI-01 alarm interface unit is designed as a standard module box with a 3-module width for mounting on DIN rail. It is equipped with 4 LEDs. The green LED marked PWR indicates the incoming power supply of the interface unit and the monitoring of the A/C communication. Three yellow LEDs marked R1 to R3 indicate the state of the A/C depending on the settings and also indicate the switching of the corresponding relay.



Fig. 1: SAI-01 module appearance

Indicator LED		
PWR	Green	Power supply / Communication
R1	Yellow	Switching on the relay 1
R2	Yellow	Switching on the relay 2
R3	Yellow	Switching on the relay 3

Table 1: LED indicators

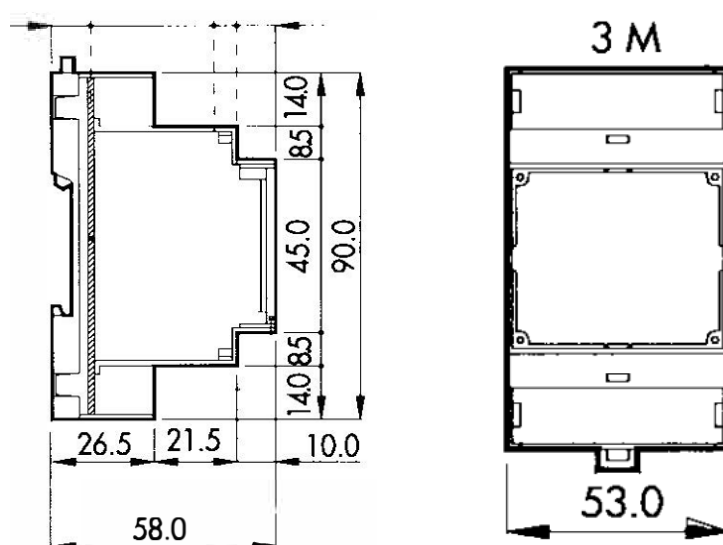


Fig. 2: Dimensions

TERMINALS

The alarm interface module is equipped with 10 screw terminals. On one side of the module, there are terminals for supply voltage 230V/50Hz and terminals for NO (normally-open) contacts of the output relays R1 to R3. On the opposite side, there are terminals for connecting two wires of the serial communication line for monitoring of error messages and states of the air conditioner.

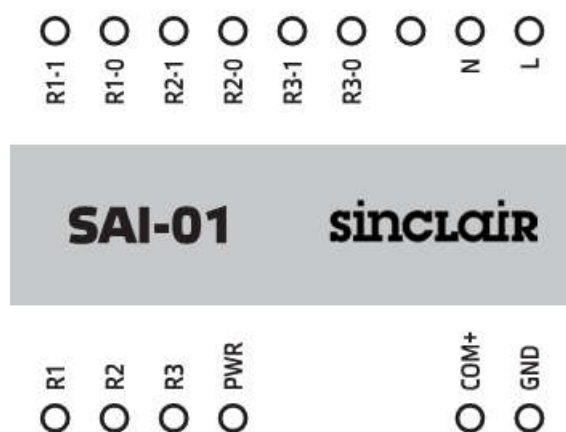


Fig. 3: Front panel with terminal designations

Designation	Signal type	Description
L	Input 230V L	Input of the mains supply voltage – phase wire
N	Input 230V N	Input of the mains supply voltage – neutral wire
R1-0	Relay output	R1 relay NO contact 230V/1A
R1-1	Relay output	R1 relay NO contact 230V/1A
R2-0	Relay output	R2 relay NO contact 230V/1A
R2-1	Relay output	R2 relay NO contact 230V/1A
R3-0	Relay output	R3 relay NO contact 230V/1A
R3-1	Relay output	R3 relay NO contact 230V/1A
COM+	Communication terminal	Output of serial communication line for monitoring
GND	Communication terminal	Output of serial communication line for monitoring

Table 2: Designation of connection terminals

INSTALLATION

The power supply 230V/50Hz is connected from the upper side of the module.

The serial communication cable is connected from the bottom side. It is necessary to observe the polarity of the A/C communication line, i.e. connect the COM+ wire to the A/C terminal marked “2” and connect the GND wire to the A/C terminal marked “1(N)”. It does not matter whether you connect the communication line to the indoor unit or the outdoor unit of the A/C system.

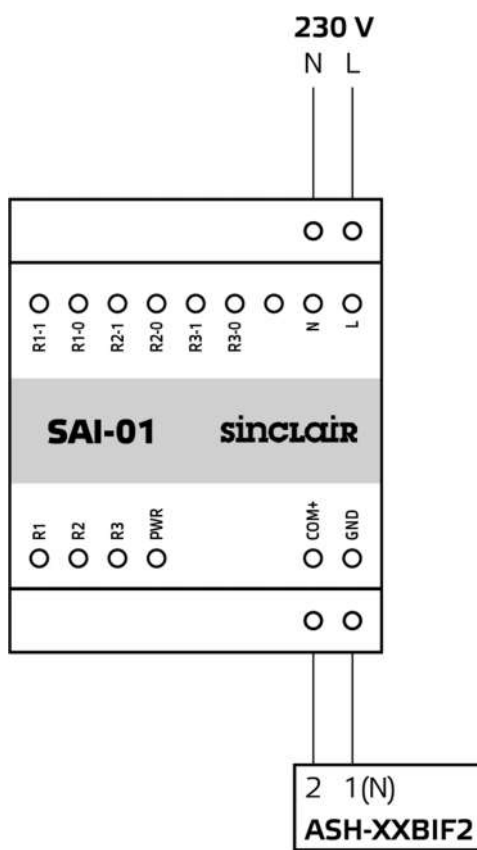


Fig. 4: Connection of the SAI-01 module

SETTINGS

For each switching relay (R1 to R3), there are two jumper positions on the terminal X7 (Fig. 5). Terminal pins can be disconnected (no jumper placed) or connected (interconnected by the jumper). Each relay (R1 to R3) can perform one of the four functions listed in the Tab. 3.

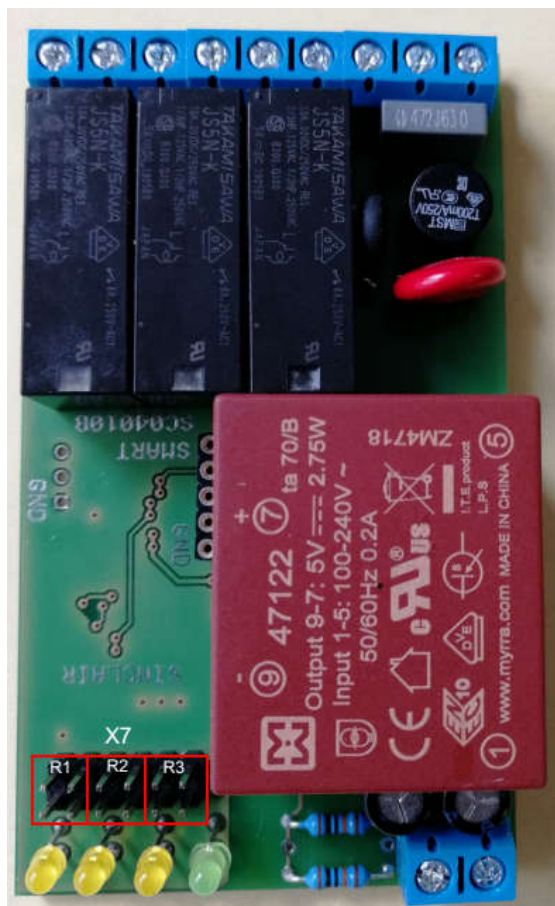
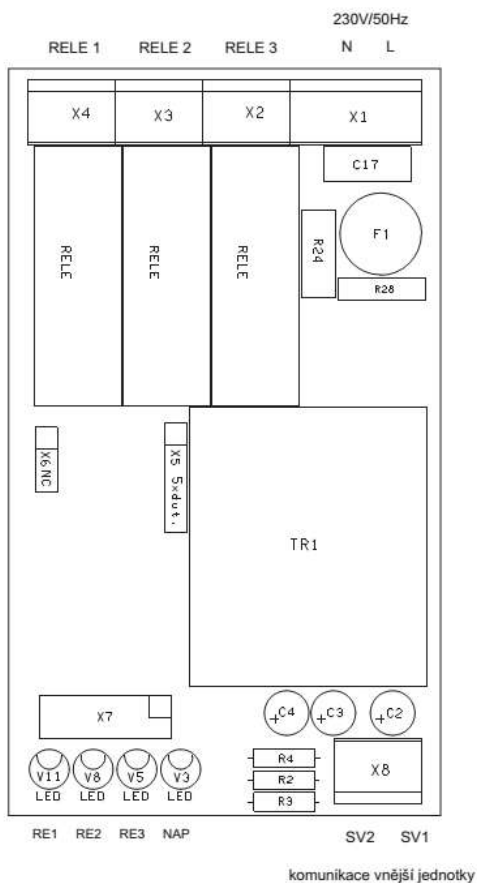


Fig. 5: Terminal X7 and designation of jumper positions of the corresponding relay

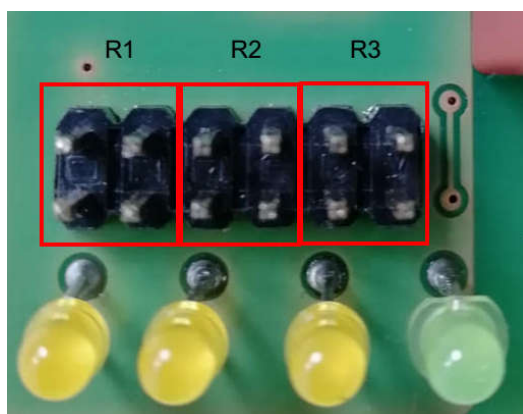


Fig. 6: Terminal X7 - detail (jumper positions)

Jumpers factory settings

All pins of the terminal X7 are fitted with jumpers from the factory. There are 2 red jumpers for relay R1, 2 green jumpers for relay R2 and 2 black jumpers for relay R3.



Fig. 7: Jumpers default positions

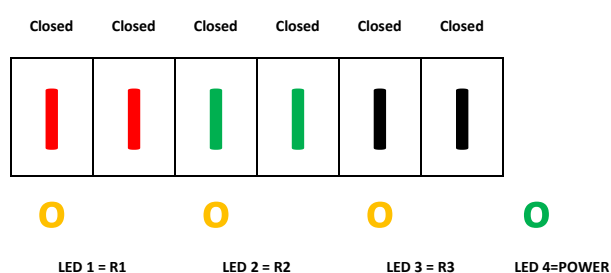


Fig. 8: Jumpers default positions on terminal X7 – graphics

Relays factory settings

The jumpers for all three relays are fully fitted from the factory, and thereby the following functions are set:

Relay 1 indicates the aggregated errors of the indoor unit and the outdoor unit (except for the outdoor unit general errors).

Relay 2 indicates the A/C limitations.

Relay 3 indicates the outdoor unit general errors.

The jumpers positions to select the functions of the individual relays are shown in the Tab. 3; the factory settings have a blue background.

Table of the relay settings

The relay function can be changed by removing the jumpers from terminal X7. To do this, remove the lower cover of the terminals and LEDs and then use tweezers to remove or replace the jumpers.

Closed position - jumper installed / Open position - jumper not installed

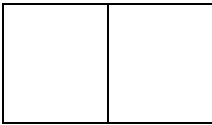

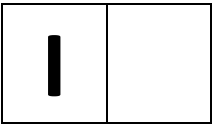

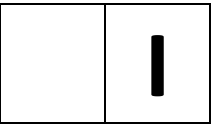

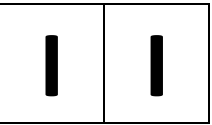

JUMPER	STATUS 1	STATUS 2	STATUS 3	STATUS 4
	Open Open  	Closed Open  	Open Closed  	Closed Closed  
RELAY 1	Limitation	IDU error	ODU error	Error (IDU+ODU)
RELAY 2	Compressor	Error (IDU+ODU)	A/C is on	Limitation
RELAY 3	A/C is on	Compressor	Cooling	ODU general error

Table 3: Combinations for jumpers settings

Storing the jumpers

The best way to protect jumpers from being lost is storing them inside the SAI-01 module. You can store the jumper either by fitting it on one pin only or by turning it by 90° and fitting it on two different unrelated pins – see Fig. 8.



Fig. 8: Storing one and two jumpers to prevent loss

EXPLANATION OF THE ADJUSTABLE STATES

IDU error = the indoor unit is malfunctioning, the A/C shuts down completely and an error message appears on the indoor unit display. Call a qualified service technician for troubleshooting. A manual restart of the A/C by disconnecting it from the power supply is required after the error has been fixed.

ODU error = the outdoor unit is malfunctioning, the A/C shuts down completely and an error message appears on the indoor unit display. Call a qualified service technician for troubleshooting. A manual restart of the A/C by disconnecting it from the power supply is required after the error has been fixed.

IDU+ODU error = aggregated error = the outdoor and/or indoor unit is malfunctioning, the A/C shuts down completely and an error message appears on the indoor unit display. Call a qualified service technician for troubleshooting. A manual restart of the A/C by disconnecting it from the power supply is required after the error has been fixed. Excludes the outdoor unit general error (**ODU general error**), includes the communication error (E6).

Limitation = some of the monitored values (temperature, pressure, current, voltage) is outside the permissible value range and therefore the A/C performance is limited by limiting the compressor frequency or shutting it down. This limitation does not appear on the indoor unit display. After the causes of the limitation have disappeared (e.g. by decreasing the compressor discharge temperature), the unit can continue to operate without limitation. In some cases, if the limitation occurs repeatedly or lasts for a certain period of time, the A/C may be shut down for one of the errors, which will then appear on the indoor unit display. Call a qualified service technician to determine the cause of the limitation and, if necessary, to fix the fault. The service technician can use the SDT-ASH diagnostic module to more accurately identify the cause of the limitation.

ODU general error = outdoor unit has a problem or protects itself from a fault. The compressor frequency and the A/C output power are reduced or the A/C shuts down completely. The error message may or may not appear on the IDU display. It also includes all outdoor unit errors (ODU error). Call a qualified service technician to determine the cause of the limitation and, if necessary, to fix the fault. The service technician can use the SDT-ASH diagnostic module to more accurately identify the cause of the general error. You can also contact the Sinclair Technical Support.

A/C is on = the relay is closed when the A/C is switched on.

Compressor = the relay is closed when the compressor is running

Cooling = the relay is closed when the cooling mode is activated.

LED INDICATION

Table 4 below provides an overview and explanation of the LED indication.

LED No.	Relay	LED colour	Indication	Description
LED 1	R1	Yellow	Off	Relay is open (off)
			On	Relay is closed (on)
LED 2	R2	Yellow	Off	Relay is open (off)
			On	Relay is closed (on)
LED 3	R3	Yellow	Off	Relay is open (off)
			On	Relay is closed (on)
LED 4	-	Green	Off	The module is not connected to the power supply
			Lights dimly	The module is powered, communication is OK
			Blinks dimly (goes off)	Communication error (E6)
			Intense 1*flash (during steady dim light)	An erroneous message during monitoring of communication between indoor and outdoor units; the communication is OK if the erroneous message does not occur more than once per second
			Lights intensively	Communication error (E6)

Table 4: LED indication

OVERVIEW OF ERROR MESSAGES

A list of error codes and limitations is given in Tables 5 through 9 below. Diagnosis and repair may only be carried out by an authorized person or a qualified service technician. Refer to the Sinclair A/C service manuals for instructions on how to identify the cause of the malfunction and repair it.

INDOOR UNIT ERROR

Code	Name	Note
E2	IDU freezing protection	Does not appear on the IDU display
E8	IDU fan overload/failure	
F1	Broken/shorted room temperature sensor	
F2	Broken/shorted IDU evaporator temperature sensor	
C5	Invalid power code	
H6	Fan DC motor malfunction	
JF	WiFi module malfunction	

Table 5: IDU errors

OUTDOOR UNIT ERROR

Listed as ODU ERROR in the table.

Code	Name	Note
E4	Compressor discharge high-temperature protection	
F0	Lack of refrigerant	
F3	Broken/shorted ambient temperature sensor	
F4	Condenser outlet temperature sensor failure	
F5	Compressor discharge sensor failure	
P5	Compressor overcurrent protection	
P8	Drive unit module high-temperature protection	
H3	Compressor overload or compressor overheating protection	
H5	IPM protection	
L3	ODU fan DC motor failure	

Table 6: ODU errors

AGGREGATED ERROR

Listed as ERROR (IDU+ODU) in the table. It includes the summary of the above errors of indoor unit, outdoor unit and communication.

Code	Name	Note
E2	Indoor unit freezing protection	Does not appear on the IDU display
E8	IDU fan overload/failure	
F1	Broken/shorted room temperature sensor	
F2	Broken/shorted IDU evaporator temperature sensor	
C5	Invalid power code	
H6	Fan DC motor malfunction	
JF	Wi-Fi module malfunction	
E4	Compressor discharge high-temperature protection	
F0	Lack of refrigerant	
F3	Broken/shorted ambient temperature sensor	
F4	Condenser outlet temperature sensor failure	
F5	Compressor discharge sensor failure	
P5	Compressor overcurrent protection	
P8	Drive unit module high-temperature protection	
H3	Compressor overload or compressor overheating protection	
H5	IPM protection	
L3	ODU fan DC motor failure	
E6	Communication error	

Table 7: Aggregated ERROR (IDU+ODU)

NOTICE – this is not an error

Code	Name	Note
CP	Cold air blowing protection	not displayed
H1	Defrosting	not displayed

ODU GENERAL ERROR

Code	Name	Note
E1	Compressor high-pressure protection	
E5	Compressor or system overload protection	
P5	Compressor overcurrent protection	The error will only appear on the IDU display if it occurs 5 times.
P7	Drive unit module sensor malfunction	
PL	DC bus low voltage protection	
PH	DC bus high voltage protection	
C6	No ground wire	
CC	Wrong wall-mounted controller	
EE	ODU memory chip malfunction	
H5	IPM protection	The error appears on the IDU display; if it occurs 6 times, the A/C is shut down.
H7	Drive module (control board) desynchronization protection	
Hc	PFC protection	
Hp	Evaporator temperature is higher than 58°C (Heating mode)	
Lc	Startup malfunction	
Lp	The indoor unit and outdoor unit do not match	
U1	Compressor phase current detection circuit failure	
U3	Voltage drop on DC bus	

Table 8: ODU general error

LIMITATION

Code	Name	Note
F6	Condenser overheat protection	Does not appear on the IDU display
F8	Compressor overcurrent protection	Does not appear on the IDU display
F9	Compressor discharge high-temperature protection	Does not appear on the IDU display
P5	Compressor overcurrent protection	The error will only appear on the IDU display if it occurs 5 times.
FH	Evaporator freezing protection	Does not appear on the IDU display
EU	Frequency limit due to the high temperature of the module	Does not appear on the IDU display
H0	IDU heat exchanger overheat protection (in Heating mode)	Does not appear on the IDU display

Table 9: Limitations

TECHNICAL DATA

Technical parameters		
Power supply	V/Hz	230/50±10%
Max. power input	VA	3 VA
Dimensions	-	Standard module box for DIN rail with a width of 53mm
Package dimensions	mm	120x100x80
Net weight	kg	0.14
Gross weight	kg	0.21
Storage temperature	°C	-20 ~ +60
Operating temperature	°C	-10 ~ +45
Outputs	3x relay NO (normally open) contact 230V/1A	
Inputs	Serial communication with the device	

PACKAGE CONTENT

Sinclair alarm interface unit SAI-01	1 pc
User manual	1 pc

NOTE CONCERNING PROTECTION OF ENVIRONMENT



This product must not be disposed of via normal household waste after its service life, but must be taken to a collection station for the recycling of electrical and electronic devices. The symbol on the product, the operating instructions or the packaging indicate such disposal procedures. The materials are recyclable in accordance with their respective symbols. By means of re-use, material recycling or any other form of recycling old appliances you are making an important contribution to the protection of our environment. Please ask your local council where your nearest disposal station is located.

In case of quality problem or other please contact your local supplier or authorized service center.

Emergency number: 112

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