red lion®

INSIGHT ENABLED

IAMS

Models No. 0001 / 0011 / 0010

Drawing No. LP0767
Version No. 104
Revision Date 15/07

c UL us LISTED

FM APPROVED

IAMS 0001 / 0011 / 0010

CONTENTS

GENERAL

WARNING!

The IAMS devices are designed for connection to hazardous electric voltages.
Ignoring this warning can result in severe personal injury or mechanical damage.
To avoid the risk of electric shock and fire, the safety instructions of this manual must be observed and the guidelines followed. The specifications must not be exceeded, and the devices must only be applied as described in the following.
Prior to the commissioning of the devices, this manual must be examined carefully.
Only qualified personnel (technicians) should install these devices. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

HAZARD-OUS VOLTAGE

WARNING!

Until the devices are fixed, do not connect hazardous voltages to the devices.
The following operations should only be carried out on disconnected devices and under ESD safe conditions:
- General mounting, connection and disconnection of wires.
- Troubleshooting the devices.

Repair of the device must be done by Red Lion Controls only.

INSTAL-LATION

WARNING

To keep the safety distances, the relay contacts on the devices must not be connected to both hazardous and non-hazardous voltages at the same time.
The IAMS devices must be mounted on a DIN rail according to DIN 46277.

WARNING

Do not open the front plate of the devices as this will cause damage to the connector for the display / programming module PGMMOD00. The devices contain no DIP-switches or jumpers.

SYMBOL IDENTIFICATION

Triangle with an exclamation mark: Warning / demand. Potentially lethal situations.

The CE mark proves the compliance of the devices with the essential requirements of the directives.

The double insulation symbol shows that the devices are protected by double or reinforced insulation.

SAFETY INSTRUCTIONS

DEFINITIONS:
Hazardous voltages have been defined as the ranges: 75 to 1500 Volt DC, and 50 to 1000 Volt AC.
Technicians are qualified persons educated or trained to mount, operate, and also troubleshoot technically correct and in accordance with safety regulations.
Operators, being familiar with the contents of this manual, adjust and operate the knobs or potentiometers during normal operation.

RECEIPT AND UNPACKING:
Unpack the device without damaging it and make sure that the manual always follows the device and is always available. The packing should always follow the device until this has been permanently mounted.
Check at the receipt of the device whether the type corresponds to the one ordered.

ENVIRONMENT:
Avoid direct sunlight, dust, high temperatures, mechanical vibrations and shock, as well as rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.
All devices fall under Installation Category II, Pollution Degree 1, and Insulation Class II.

MOUNTING:
Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these should connect the devices. Should there be any doubt as to the correct handling of the devices, please contact your local distributor or, alternatively, **Red Lion Controls Worldwide Headquarters,** 20 Willow Springs Circle, York, PA 17406 USA, Phone: +1 (717) 767-6511, Fax: +1 (717) 764-0839

Mounting and connection of the devices should comply with national legislation for mounting of electric materials, i.a. wire cross section, protective fuse, and location. Descriptions of input / output and supply connections are shown in the block diagram and side label.

The following apply to fixed hazardous voltages-connected devices:

The max. size of the protective fuse is 10 A and, together with a power switch, it should be easily accessible and close to the device. The power switch should be marked with a label indicating that it will switch off the voltage to the device.

Year of manufacture can be taken from the first two digits in the serial number.

UL INSTALLATION REQUIREMENTS:

Use 60/75°C copper conducters only
For use only in pollution degree 2 or better
Max. ambient temperature..... 60°C
Max. wire size..... AWG 26-14
UL file number..... E324843

CALIBRATION AND ADJUSTMENT:

During calibration and adjustment, the measuring and connection of external voltages must be carried out according to the specifications of this manual. The technician must use tools and instruments that are safe to use.

NORMAL OPERATION:

Operators are only allowed to adjust and operate devices that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard, and the device is easily accessible.

CLEANING:

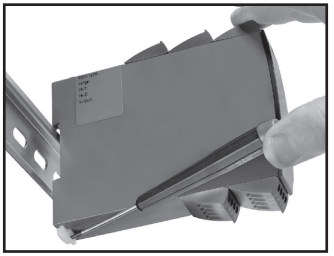
When disconnected, the devices may be cleaned with a cloth moistened with distilled water.

LIABILITY:

To the extent that the instructions in this manual are not strictly observed, the customer cannot advance a demand against Red Lion that would otherwise exist according to the concluded sales agreement.

HOW TO DISMANTLE THE IAMS DEVICES

First, remember to demount the connectors with hazardous voltages.



Picture 1:
Detach the device from the DIN rail by lifting the bottom lock.

When front LED lights red / display shows AO.ER

IAMS0001 and IAMS0011 are designed with a high safety level. Therefore, a continuous measurement of the outgoing current is carried out on a 4...20 mA output signal. If the current output signal is different from the internally calculated output value or the current output is 0 (due to e.g. an open circuit breakage), an error mode switches on the red front LED and disables the relays. This function is not a default option but must be actively selected via the programming menu (S4...20 & S20...4).

The error mode can only be reset by switching off and then switching on the supply voltage to the device.

IAMS 0001 / 0011 / 0010

- *Input for RTD, TC, Ohm, potentiometer, mA and V*
- *2-wire supply > 16 V*
- *FM-approved for installation in Div. 2*
- *Output for current, voltage and 2 relays*
- *Universal AC or DC supply*

Advanced features

- Programmable via detachable display front (PGMMOD00), process calibration, signal and relay simulation, password protection, error diagnostics and selection of help text in several languages.

Application

- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a standard analogue current / voltage signal, i.e. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control with 2 pairs of potential-free relay contacts and analogue output.
- Galvanic separation of analogue signals and measurement of floating signals.
- The IAMS0001 and IAMS0011 have been designed according to strict safety requirements and are thus suitable for application in SIL 2 installations.

Technical characteristics

- When the devices are used in combination with the PGMMOD00 display / programming front, all operational parameters can be modified to suit any application. As the devices are designed with electronic hardware switches, it is not necessary to open them for setting of DIP-switches.
- A green / red front LED indicates normal operation and malfunction. A yellow LED is ON for each active output relay.
- Continuous check of vital stored data for safety reasons.
- 4-port 2.3 kVAC galvanic isolation.

PGMMOD00 DISPLAY / PROGRAMMING FRONT

Functionality

The simple and easily understandable menu structure and the explanatory help texts guide you effortlessly and automatically through the setup steps, thus making the product very easy to use. Functions and setup options are described in the section ”Setup / operating the function keys”.

Application

- Communications interface for modification of operational parameters in the IAMS devices.
- Can be moved from one device to another of the same type and download the setup of the first device to subsequent devices.
- Fixed display for readout of process data and status.

Technical characteristics

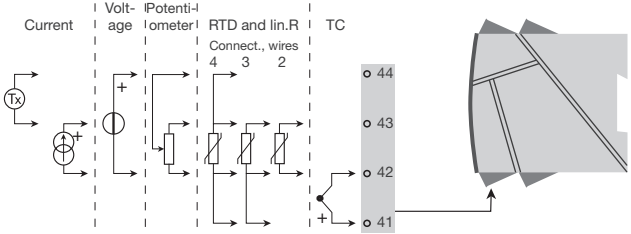
- LCD display with 4 lines; Line 1 (H=.2 inch/5.57 mm) shows input signal, line 2 (H=.2 inch/3.33 mm) shows units, line 3 (H=.13 inch/3.33 mm) shows analogue output or tag no. and line 4 shows communication and relay status.
- Programming access can be blocked by assigning a password. The password is saved in the device in order to ensure a high degree of protection against unauthorised modifications to the setup.

Mounting / installation

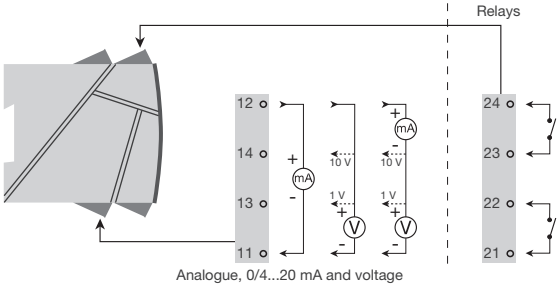
- Click PGMMOD00 onto the front of the device.

APPLICATIONS

Input signals:

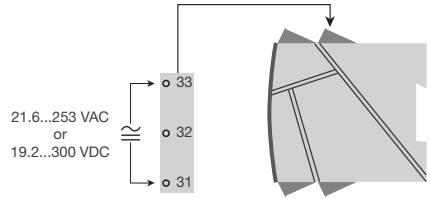


Output signals:



Analogue, 0/4...20 mA and voltage

Supply:



Order codes

IAMS0001	**Universal transmitter with analog output**
IAMS0011	**Universal transmitter with analog output / 2 relays**
IAMS0010	**Universal limit switch with 2 relays**
PGMMOD00	**Display / programming module**

Electrical specifications

Specifications range:
-20°C to +60°C

Common specifications:

Supply voltage, universal ..... 21.6...253 VAC,
or 19.2...300 VDC
Max. consumption..... ≤ 2.5 W
Fuse..... 400 mA SB / 250 VAC
Isolation voltage, test / operation ..... 2.3 kVAC / 250 VAC
Communications interface ..... Programming front PGMMOD00
Signal / noise ratio ..... Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%):
Temperature input..... ≤ 1 s
mA / V input..... ≤ 400 ms
Calibration temperature..... 20...28°C

Display resolution: The temperature display automatically changes to tenths with values less than 1000 degrees.

Accuracy, the greater of the general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	≤ ±0.1% of span	≤ ±0.01% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
mA	≤ ±4 µA	≤ ±0.4 µA / °C
Volt	≤ ±20 µV	≤ ±2 µV / °C
Pt100	≤ ±0.2°C	≤ ±0.01°C / °C
Linear resistance	≤ ±0.1 Ω	≤ ±0.01 Ω / °C
Potentiometer	≤ ±0.1 Ω	≤ ±0.01 Ω / °C
TC type: E, J, K, L, N, T, U	≤ ±1°C	≤ ±0.05°C / °C
TC type: R, S, W3, W5, LR	≤ ±2°C	≤ ±0.2°C / °C
TC type: B 85...200°C	≤ ±4°C	≤ ±0.4°C / °C
TC type: B 200...1820°C	≤ ±2°C	≤ ±0.2°C / °C

EMC immunity influence ..... < ±0.5% of span
Extended EMC immunity:
NAMUR NE 21, A criterion, burst ..... < ±1% of span

Auxiliary supplies:
2-wire supply (terminal 44...43)..... 25...16 VDC / 0...20 mA
Max. wire size..... 1 x 2.5 mm^2 stranded wire
Screw terminal torque..... 0.5 Nm
Relative humidity..... < 95% RH (non-cond.)
Dimensions, without display front (HxBxD).. 109 x 23.5 x 104 mm
Dimensions, with display front (HxBxD)..... 109 x 23.5 x 116 mm
Protection degree (enclosure / terminals) ... IP50 / IP20
Weight ..... 170 g / 185 g with PGMMOD00

RTD, linear resistance and potentiometer input:

Input type	Min. value	Max. value	Standard
Pt100	-200°C	+850°C	IEC60751
Ni100	-60°C	+250°C	DIN 43760
Lin. R	0 Ω	10000 Ω	-
Potentiometer	10 Ω	100 kΩ	-

Input for RTD types:
Pt10, Pt20, Pt50, Pt100, Pt200, PT250, Pt300, Pt400, Pt500, Pt1000
Ni50, Ni100, Ni120, Ni1000

Cable resistance per wire (max.), RTD..... 50 Ω
Sensor current, RTD..... Nom. 0.2 mA
Effect of sensor cable resistance
(3- / 4-wire), RTD..... < 0.002 Ω / Ω
Sensor error detection, RTD ..... Yes
Short circuit detection, RTD..... < 15 Ω

TC input:

Type	Min. value	Max. value	Standard
B	0°C	+1820°C	IEC 60584-1
E	-100°C	+1000°C	IEC 60584-1
J	-100°C	+1200°C	IEC 60584-1
K	-180°C	+1372°C	IEC 60584-1
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC 60584-1
R	-50°C	+1760°C	IEC 60584-1
S	-50°C	+1760°C	IEC 60584-1
T	-200°C	+400°C	IEC 60584-1
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
LR	-200°C	+800°C	GOST 3044-84

Cold junction compensation (CJC)
via internally mounted sensor..... < ±1,0 °C
Sensor error detection, all TC types ..... Yes
Sensor error current:
when detecting ..... Nom. 2 µA
else..... 0 µA

Current input:

Measurement range ..... 0...20 mA
Programmable measurement ranges..... 0...20 and 4...20 mA
Input resistance @ 20°C..... Max. 70 Ω
(20 Ω + PTC 50 Ω thermistor)
Sensor error detection:
Loop break 4...20 mA..... Yes

Voltage input:

Measurement range ..... 0...12 VDC
Programmable measurement ranges..... 0...1 / 0.2...1 / 0...5 / 1...5 /
0...10 and 2...10 VDC
Input resistance..... Nom. 10 MΩ

Current output:

Signal range (span)	0...20 mA
Programmable signal ranges	0...20 / 4...20 / 20...0 and 20...4 mA
Load (max.)	20 mA / 800 Ω / 16 VDC
Load stability	≤ 0.01% of span / 100 Ω
Sensor error detection	0 / 3.5 / 23 mA / none
NAMUR NE 43 Upscale / Downscale	23 mA / 3.5 mA
Output limitation:	
on 4...20 and 20...4 mA signals	3.8...20.5 mA
on 0...20 and 20...0 mA signals	0...20.5 mA
Current limit	≤ 28 mA

Voltage output:

Signal range	0...10 VDC
Programmable signal ranges	0...1 / 0.2...1 / 0...10 / 0...5 / 1...5 / 2...10 / 1...0 / 1...0.2 / 5...0 / 5...1 / 10...0 og 10...2 V
Load (min.)	500 kΩ

Relay outputs:

Relay functions	Setpoint, Window, Sensor error, Power and Off
Hysteresis	0.1...25% of span or display range
On and Off delay	0...3600 s
Sensor error detection	Break / Make / Hold
Max. voltage	250 VRMS
Max. current	2 A / AC or 1 A / DC
Max. AC power	500 VA

Ex / I.S. approval:

FM, applicable in	Class I, Div. 2, Group A, B, C, D Class I, Div. 2, Group IIC Zone 2
Max. ambient temperature for T5	60°C

Observed authority requirements:	**Standard:**
EMC 2004/108/EC	
Emission and immunity	EN 61326-1
LVD 2006/95/EC	EN 61010-1
FM	3600, 3611, 3810 and ISA 82.02.01
UL, Standard for Safety	UL 508

of span = of the currently selected measurement range

Visualisation of sensor error detection and input signal outside range

Sensor error check:	
Setup	Sensor error detection:
R1, ERR.ACT=NONE - R2, ERR.ACT=NONE, OUT.ERR=NONE	OFF
Else:	ON

Outside range readout (IN.LO, IN.HI): If the valid range of the A/D converter or the polynomial is exceeded			
Input	Range	Readout	Limit
VOLT	0...1 V / 0.2...1 V	IN.LO	< -25 mV
		IN.HI	> 1.2 V
	0...10 V / 2...10 V	IN.LO	< -25 mV
		IN.HI	> 12 V
CURR	0...20 mA / 4...20 mA	IN.LO	< -1.05 mA
		IN.HI	> 25.05 mA
LIN.R	0...800 Ω	IN.LO	< 0 Ω
		IN.HI	> 1075 Ω
	0...10 kΩ	IN.LO	< 0 Ω
		IN.HI	< 110 kΩ
POTM	-	IN.LO	< -0.5 %
		IN.HI	> 100.5 %
TEMP	TC / RTD	IN.LO	< temperature range -2°C
		IN.HI	> temperature range +2°C

Display readout below min.- / above max. (-1999, 9999):			
Input	Range	Readout	Limit
All	All	-1999	Display readout <-1999
		9999	Display readout >9999

Sensor error detection limits

Sensor error detection (SE.BR, SE.SH):			
Input	Range	Readout	Limit
CURR	Loop break (4..20 mA)	SE.BR	<= 3.6 mA; > = 21 mA
POTM	All, SE.BR on all 3-wire	SE.BR	> ca. 126 kΩ
LIN.R	0...800 Ω	SE.BR	> ca. 875 Ω
	0...10 kΩ	SE.BR	> ca. 11 kΩ
TEMP	TC	SE.BR	> ca. 750 kΩ / (1.25 V)
	RTD, 2-, 3-, and 4-wire	SE.BR	> ca. 15 kΩ
	No SE.SH for Pt10, Pt20 and Pt50	SE.SH	< ca. 15 Ω

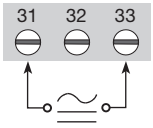
Error indications

Readout at hardware error		
Error search	Readout	Error cause
Test of internal CJC sensor	CJ.ER	CJC sensor defect or temperature outside range
Checksum test of the setup in FLASH	FL.ER	Error in FLASH
Check measurement of analogue output current	AO.ER	1) Incorrect current output (only S4...20/S20...4 mA)
Communications test PGMMOD00 / device	NO.CO	Connection error
Check that input signal matches input setup	IN.ER	1) Error levels on input
Check that saved setup in PGMMOD00 matches device	TY.ER	Setup mismatch

! Error indications in the display flash once per second. The help text explains the error.
1) The error is reset by switching off and then switching on the supply voltage to the device.

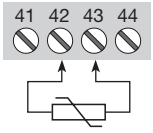
CONNECTIONS

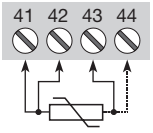
Supply:

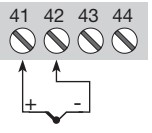


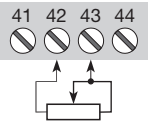
If DC power is used,
polarity does not matter

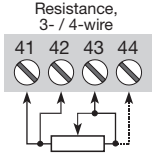
Inputs:

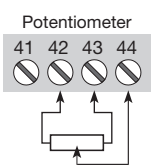


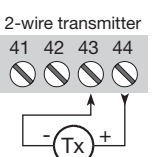




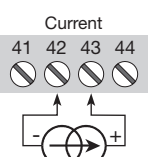




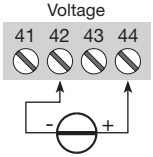




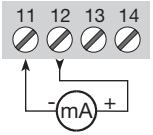
Current input
needing IAMS power

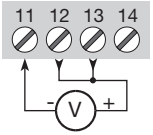


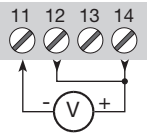
Self or externally
powered transmitter

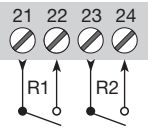


Outputs:

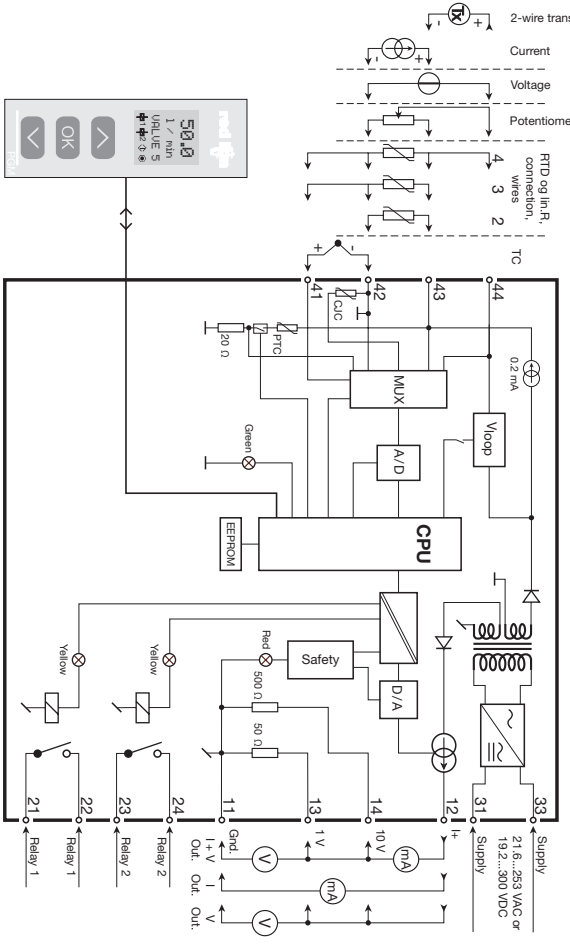








BLOCK DIAGRAM



SETUP /
OPERATING THE FUNCTION KEYS

Documentation for routing diagram.

In general:

When setting up the IAMS devices, you will be guided through all parameters and you can choose the settings which fit the application. For each menu there is a scrolling help text which is automatically shown in line 3 on the display.

Setup is carried out by use of the 3 function keys:

- ⌃ will increase the numerical value or choose the next parameter
- ⌄ will decrease the numerical value or choose the previous parameter
- OK will save the chosen value and proceed to the next menu

When setup is completed, the display will return to the default state 1.0.

Pressing and holding OK will return to the previous menu or return to the default state (1.0) without saving the changed values or parameters.

If no key is activated for 1 minute, the display will return to the default state (1.0) without saving the changed values or parameters.

Further explanations:

Fast setpoint adjustment and relay test: These menus allow you to make a quick setpoint change and relay test when the FastSet menu is activated. This function can only be activated when the relays are set for setpoint function and are controlled by a setpoint.

Pressing ⌃ and ⌄ simultaneously will activate a relay test and change the state of the relay.

Pressing OK will save the setpoint change.

Holding down OK for more than 1 second will return the unit to the default state without saving the setpoint change.

Password protection: Programming access can be blocked by assigning a password. The password is saved in the device in order to ensure a high degree of protection against unauthorised modifications to the setup. Default password 2008 allows access to all setup modules.

Signal and sensor error info via PGMMOD00

Sensor error (see limits in the table) is displayed as SE.BR (sensor break) or SE.SH (sensor short). Signals outside the selected range (not sensor error, see table for limits) are displayed as IN.LO indicating low input signal or IN.HI indicating high input signal. The error indication is displayed in line 3 as text and at the same time the backlight flashes. Line 4 of the display is a status line which displays status of relay 1 and relay 2, COM (flashing bullet) indicating correct functioning of PGMMOD00 and arrow up/down which indicates tendency readout of the input signal. If the figure 1 or figure 2 flashes, the unit has detected that the setpoint has been exceeded and that the relay is in “delay” mode. When the delay time has passed and the relay makes/breakes, the relay sign either displays or disappears.

Signal and sensor error indication without display front

Status of the unit can also be read from the red/green LED in the front of the device.

Green flashing LED 13 Hz indicates normal operation.
Green flashing LED 1 Hz indicates sensor error.
Steady red LED indicates internal error.

Relay functions

5 different settings of relay function can be selected.

Setpoint:	The relay trips at a setpoint value with hysteresis.
Window:	The relay has a window that is defined by a low and a high setpoint. On both sides of the window the relay has the same status.
Error function:	The relay is activated by sensor error.
Power:	The relay is activated as long as the power is on.
Off:	The relay is deactivated.

I**ncreasing/decreasing:** The relays can be set to activate at increasing or decreasing input signal.

Delay: An ON and an OFF delay can be set on both relays in the range 0...3600 s.

Hysteresis: A hysteresis can be set at 0.1...25% of the span or of the selected display range.

Advanced functions

The unit gives access to a number of advanced functions which can be reached by answering “Yes” to the point “adv.set”.

Display setup: Here you can adjust the brightness contrast and the backlight. Setup of TAG numbers with 6 alphanumerics. Selection of functional readout in line 3 of the display - choose between readout of analogue output or tag no.

Two-point process calibration: The unit can be process-calibrated in 2 points to fit a given input signal . A low input signal (not necessarily 0%) is applied and the actual value is entered. Then a high signal (not necessarily 100%) is applied and the actual value is entered. If you accept to use the calibration, the unit will work according to this new adjustment. If you later reject this menu point or choose another type of input signal the unit will return to factory calibration.

Process simulation function: If you agree to the point “EN.SIM” it is possible to simulate an input signal by means of the arrow keys and thus control the output signal up or down. When you finalise the point with OK, the unit returns to normal mode. The following point allows you to activate relay 1 and relay 2 by means of the arrow-keys up/down. You must exit the menu by pressing OK (no time-out).

Password: Here you can choose a password between 0000 and 9999 in order to protect the unit against unauthorised modifications to the setup. The unit is delivered default without password. If you have locked the unit with a password by mistake, you can always open the menu by using the master password 2008.

Language: In the menu ”lang.setup” you can choose between 7 different language versions of help texts that will appear in the menu. You can choose between UK, DE, FR, IT, ES, SE and DK.

Auto diagnosis

The unit performs an advanced auto diagnosis of the internal circuits.
The following possible errors can by displayed in the front unit PGMMOD00.

CJ.ER - CJC sensor defect or CJC temperature outside range
FL.ER - Flash error
AO.ER - No load on the current output (only for S4...20 mA / S20...4 mA)
NO.CO - Connection error
IN.ER - Error levels on input
TY.ER - Setup in PGMMOD00 does not match this product type or firmware revision

Selection of units

After choosing the input signal type you can choose which process units should be displayed in text line 2 (see table). By selection of temperature input the process value is always displayed in Celsius or Fahrenheit. This is selected in the menu point after selection of temperature input.

Safety readback

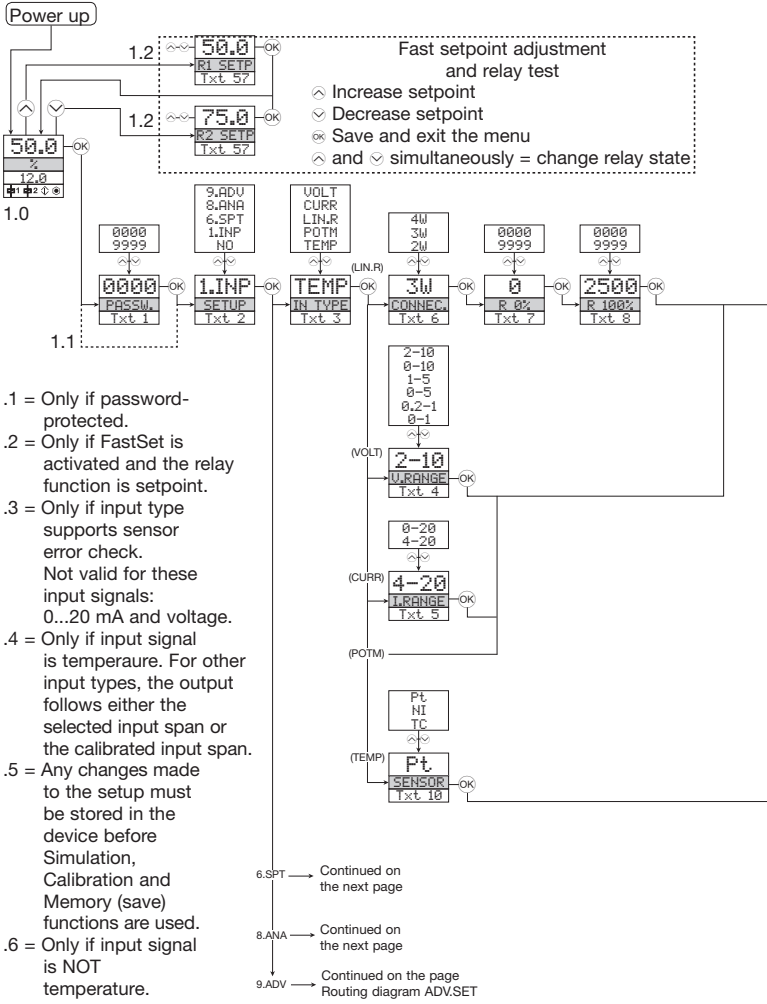
When the device is delivered with default configuration, the SIL function is disabled. The safety readback function (loop surveillance) can be selected in the menu O.RANGE, thus enabling the device to run in SIL mode. In order to enable the SIL functionality, the menu item S4...20 mA or S20...4 mA must be selected. Please note, however, that when safety readback is enabled, a sensor error will be indicated as an error on the analogue output signal.

Memory

In the memory menu you can save the configuration of the device in the PGMMOD00, and then move the PGMMOD00 onto another device of the same type / firmware version and download the configuration in the new device.

The display module reads the unit when plugged into the unit.

No setup:	Loads to display module and exits.
Save memory <SAVE>:	Saves the unit's program into the display module.
Load memory <LOAD>:	Loads previously saved program in the display module to the unit.



1.1 = Only if password-protected.

1.2 = Only if FastSet is activated and the relay function is setpoint.

1.3 = Only if input type supports sensor error check. Not valid for these input signals: 0...20 mA and voltage.

1.4 = Only if input signal is temperaure. For other input types, the output follows either the selected input span or the calibrated input span.

1.5 = Any changes made to the setup must be stored in the device before Simulation, Calibration and Memory (save) functions are used.

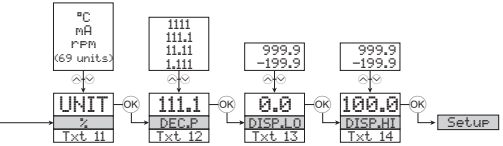
1.6 = Only if input signal is NOT temperature.

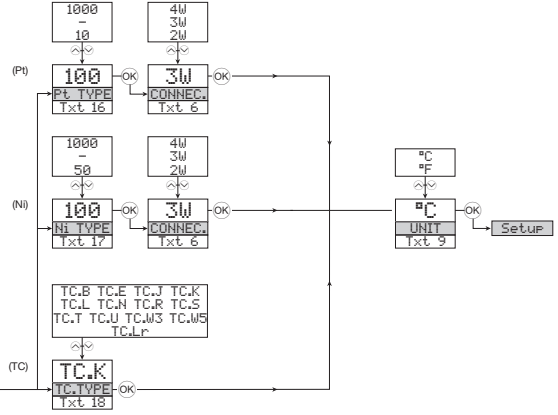
ROUTING DIAGRAM

If no key is activated for 1 minute, the display will return to the default state 1.0 without saving setup changes (except INP.SIM and REL.SIM).

- ⌃ Increase value / choose next parameter
- ⌄ Decrease value / choose previous parameter
- OK Save the chosen value and proceed to the next menu

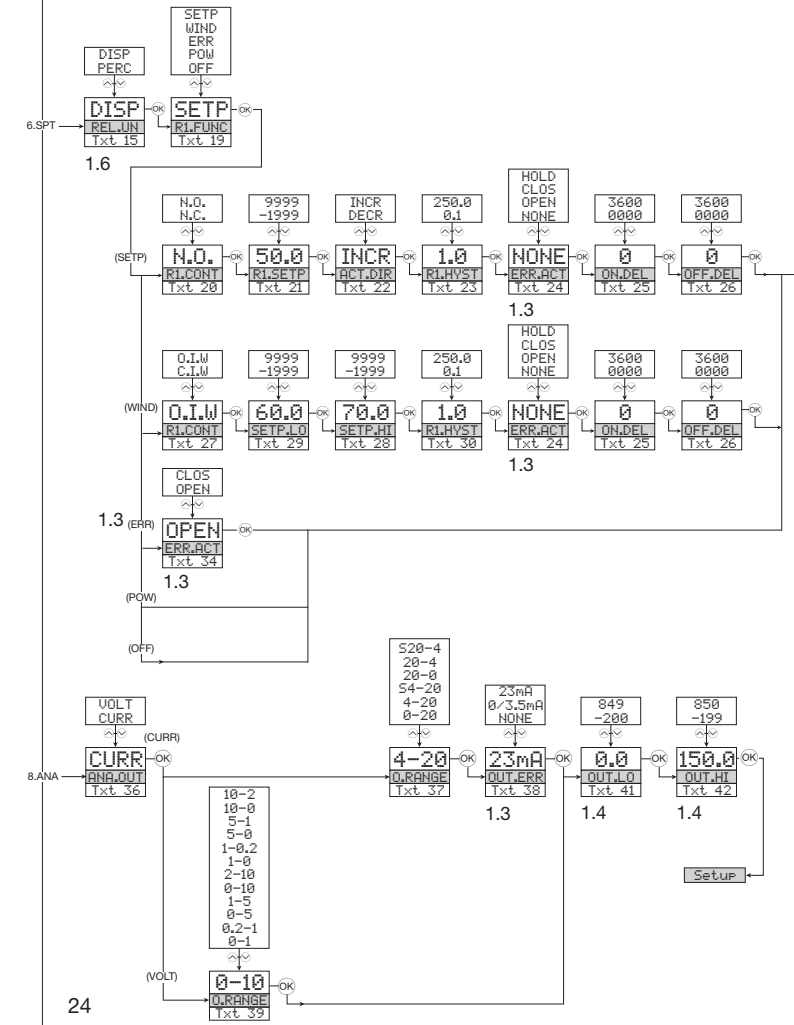
Hold OK Back to previous menu / return to menu 1.0 without saving

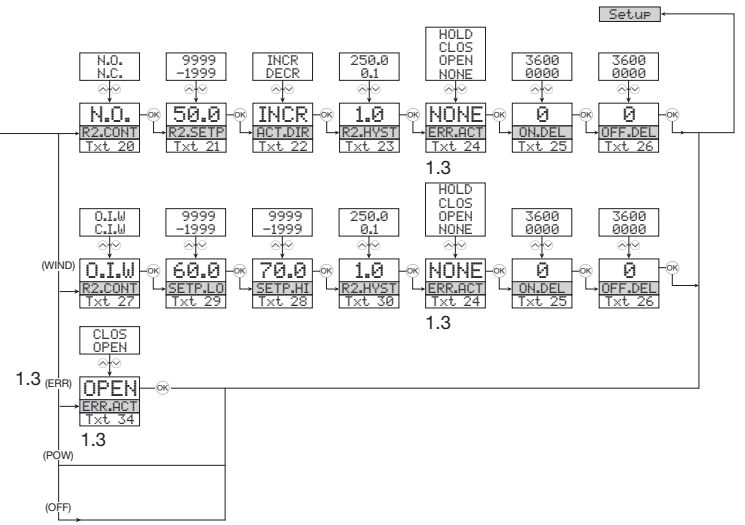




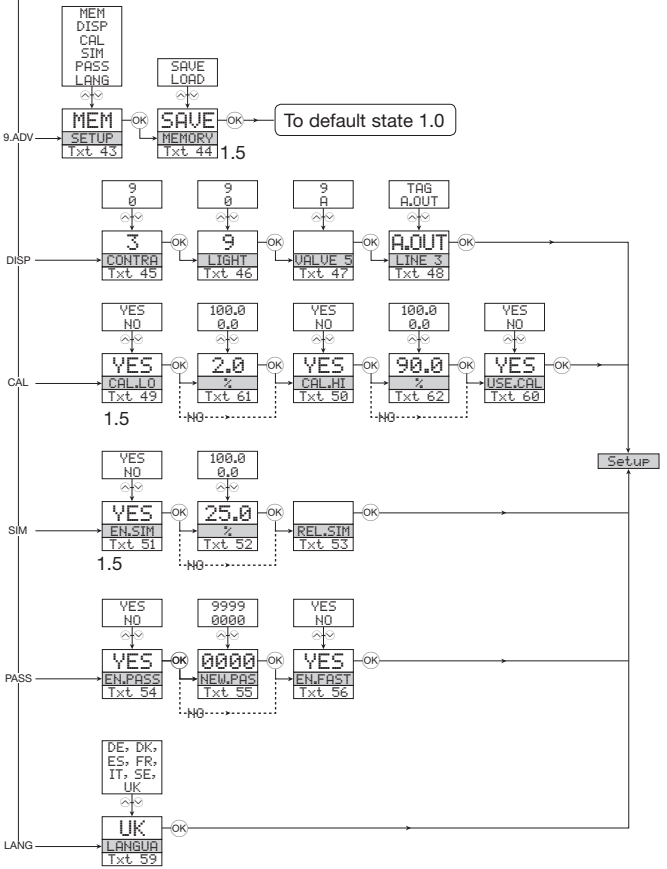
Selectable UNITS:

°C	ft/min	Hz	kg	l/min	m3/h	mol	pH	uS
°F	ft/s	in	kJ	l/s	m3/min	MPa	rpm	V
%	g	in/h	kPa	m	mA	mV	s	W
A	gal/h	in/min	kV	m/h	mbar	MW	S	Wh
bar	gal/min	in/s	kW	m/min	mils	MWh	t	yd
cm	GW	ips	kWh	m/s	min	N	t/h	[blank]
ft	hp	K	l	m/s2	mm	Ohm	uA	
ft/h	hPa	kA	l/h	m3	mm/s	Pa	um	


DISP
PERC
SETP
WIND
ERR
POW
OFF
6.SPT
DISP
REL.UN
Txt 15
OK
SETP
R1.FUNC
Txt 19
1.6
(SETP)
N.O.
N.C.
N.O.
R1.CONT
Txt 20
9999
-1999
50.0
R1.SETP
Txt 21
INCR
DECR
INCR
ACT.DIR
Txt 22
250.0
0.1
1.0
R1.HYST
Txt 23
HOLD
CLOS
OPEN
NONE
NONE
ERR.ACT
Txt 24
3600
0000
0
ON.DEL
Txt 25
3600
0000
0
OFF.DEL
Txt 26
1.3
(WIND)
O.I.W
C.I.W
O.I.W
R1.CONT
Txt 27
9999
-1999
60.0
SETP.LO
Txt 29
9999
-1999
70.0
SETP.HI
Txt 28
250.0
0.1
1.0
R1.HYST
Txt 30
HOLD
CLOS
OPEN
NONE
NONE
ERR.ACT
Txt 24
3600
0000
0
ON.DEL
Txt 25
3600
0000
0
OFF.DEL
Txt 26
1.3
CLOS
OPEN
1.3 (ERR)
OPEN
ERR.ACT
Txt 34
1.3
(POW)
(OFF)
VOLT
CURR
(CURR)
8.ANA
CURR
ANA.OUT
Txt 36
S20-4
20-4
20-0
S4-20
4-20
0-20
4-20
O.RANGE
Txt 37
23mA
0/3.5mA
NONE
23mA
OUT.ERR
Txt 38
1.3
849
-200
0.0
OUT.LO
Txt 41
1.4
850
-199
150.0
OUT.HI
Txt 42
1.4
Setup
10-2
10-0
5-1
5-0
1-0.2
1-0
2-10
0-10
1-5
0-5
0.2-1
0-1
(VOLT)
0-10
O.RANGE
Txt 39


Setup
N.O.
N.C.
9999
-1999
INCR
DECR
250.0
0.1
HOLD
CLOS
OPEN
NONE
3600
0000
3600
0000
N.O.
R2.CONT
Txt 20
50.0
R2.SETP
Txt 21
INCR
ACT.DIR
Txt 22
1.0
R2.HYST
Txt 23
NONE
ERR.ACT
Txt 24
0
ON.DEL
Txt 25
0
OFF.DEL
Txt 26
OK
1.3
O.I.W
C.I.W
9999
-1999
9999
-1999
250.0
0.1
HOLD
CLOS
OPEN
NONE
3600
0000
3600
0000
(WIND)
O.I.W
R2.CONT
Txt 27
60.0
SETP.LO
Txt 29
70.0
SETP.HI
Txt 28
1.0
R2.HYST
Txt 30
NONE
ERR.ACT
Txt 24
0
ON.DEL
Txt 25
0
OFF.DEL
Txt 26
1.3
CLOS
OPEN
1.3 (ERR)
OPEN
ERR.ACT
Txt 34
1.3
(POW)
(OFF)

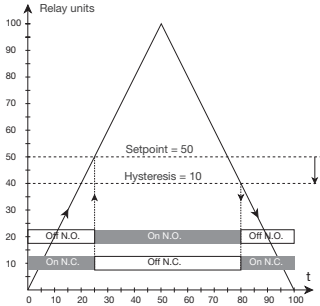
ROUTING DIAGRAM
ADVANCED SETTINGS (ADV.SET)



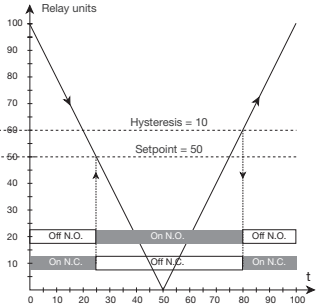
SCROLLING HELP TEXT IN DISPLAY LINE 3

[01] Set correct password
[02] Select setup module or NO to store and exit
[03] Select temperature input
Select potentiometer input
Select linear resistance input
Select current input
Select voltage input
[04] Select 0.0-1 V input range
Select 0.2-1 V input range
Select 0-5 V input range
Select 1-5 V input range
Select 0-10 V input range
Select 2-10 V input range
[05] Select 0-20 mA input range
Select 4-20 mA input range
[06] Select 2-wire sensor connection
Select 3-wire sensor connection
Select 4-wire sensor connection
[07] Set resistance value low
[08] Set resistance value high
[09] Select Celsius as temperature unit
Select Fahrenheit as temperature unit
[10] Select TC sensor type
Select Ni sensor type
Select Pt sensor type
[11] Select display unit
[12] Select decimal point position
[13] Set display range low
[14] Set display range high
[15] Set relays in % of input range
Set relays in display units
[16] Select Pt10 as sensor type
Select Pt20 as sensor type
Select Pt50 as sensor type
Select Pt100 as sensor type
Select Pt200 as sensor type
Select Pt250 as sensor type
Select Pt300 as sensor type
Select Pt400 as sensor type
Select Pt500 as sensor type
Select Pt1000 as sensor type
[17] Select Ni50 as sensor type
Select Ni100 as sensor type
Select Ni120 as sensor type
Select Ni1000 as sensor type
[18] Select TC-B as sensor type
Select TC-E as sensor type
Select TC-J as sensor type
Select TC-K as sensor type
Select TC-L as sensor type
Select TC-N as sensor type
Select TC-R as sensor type
Select TC-S as sensor type
Select TC-T as sensor type
Select TC-U as sensor type
Select TC-W3 as sensor type
Select TC-W5 as sensor type
Select TC-Lr as sensor type
[19] Select OFF function - relay is permanently off
Select POWER function - relay indicates power status OK
Select ERROR function - relay indicates sensor error only
Select WINDOW function - relay is controlled by 2 setpoints
Select SETPOINT function - relay is controlled by 1 setpoint
[20] Select Normally Closed contact
Select Normally Open contact
[21] Set relay setpoint
[22] Activate relay on decreasing signal
Activate relay on increasing signal
[23] Set relay hysteresis
[24] No error action - undefined status at error
Open relay contact at error
Close relay contact at error
Hold relay status at error
[25] Set relay ON delay in seconds
[26] Set relay OFF delay in seconds
[27] Relay contact is Open Inside Window
Relay contact is Closed Inside Window
[28] Set relay window setpoint low
[29] Set relay window setpoint high
[30] Set relay window hysteresis
[34] Open relay contact at error
Close relay contact at erro
[36] Select current as analogue output type
Select voltage as analogue output type
[37] Select 0-20 mA output range
Select 4-20 mA output range
Select S4-20 mA with safety readback
Select 20-0 mA output range
Select 20-4 mA output range
Select S20-4 mA with safety readback
[38] Select no error action - output undefined at error
Select downscale at error
Select NAMUR NE43 downscale at error
Select NAMUR NE43 upscale at error
[39] Select 0.0-1 V output range
Select 0.2-1 V output range
Select 0-5 V output range
Select 1-5 V output range
Select 0-10 V output range
Select 2-10 V output range
Select 1-0.0 V output range
Select 1-0.2 V output range
Select 5-0 V output range
Select 5-1 V output range
Select 10-0 V output range
Select 10-2 V output range
[41] Set temperature for analogue output low
[42] Set temperature for analogue output high
[43] Enter Language setup
Enter Password setup
Enter simulation mode
Perform process calibration
Enter display setup
Perform memory operations
[44] Load saved setup into device
Save setup in display front
[45] Adjust LCD contrast
[46] Adjust LCD backlight
[47] Write a 6-character device TAG
[48] Analogue output value is shown in display line 3
Device TAG is shown in display line 3
[49] Calibrate Input low to process value?
[50] Calibrate Input high to process value?
[51] Enable simulation mode?
[52] Set the input simulation value
[53] Relay simulation - use ^ and v to toggle relay 1 and 2
[54] Enable password protection?
[55] Set new password
[56] Enable Fastset functionality?
[57] Relay setpoint - press OK to save
[58] Relay setpoint - Read only
[59] Select language
[60] Use process calibration values?
[61] Set value for low calibration point
[62] Set value for high calibration poin

Graphic depiction of relay action Setpoint

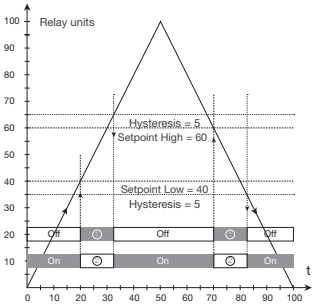


Relay action: Increasing

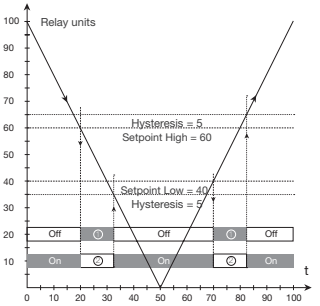


Relay action: Decreasing

Graphic depiction of relay action Window



Relay function: Window (shown for increasing signal)
Contact: Closed inside window = ①
Contact: Open inside window = ②



Relay function: Window (shown for decreasing signal)
Contact: Closed inside window = ①
Contact: Open inside window = ②