4104

Universal Signal Transmitter

No. 4104V100-UK
From ser. no 121479001

SIGNALS THE BEST

DK ▶ PR electronics A/S tilbyder et bredt program af analoge og digitale signalbehandlingsmoduler til industriel automation. Programmet består af Isolatorer, Displays, Ex-barrierer, Temperaturtransmittere, Universaltransmittere mfl. Vi har modulerne, du kan stole på i selv barske miljøer med elektrisk støj, vibrationer og temperaturudsving, og alle produkter opfylder de strengeste internationale standarder. Vores motto »Signals the Best« er indbegrebet af denne filosofi – og din garanti for kvalitet.

UK ▶ PR electronics A/S offers a wide range of analogue and digital signal conditioning devices for industrial automation. The product range includes Isolators, Displays, I.S. Interfaces, Temperature Transmitters, and Universal Devices. You can trust our products in the most extreme environments with electrical noise, vibrations and temperature fluctuations, and all products comply with the most exacting international standards. »Signals the Best« is the epitome of our philosophy – and your guarantee for quality.

FR ▶ PR electronics A/S offre une large gamme de produits pour le traitement des signaux analogiques et numériques dans tous les domaines industriels. La gamme de produits s'étend des transmetteurs de température aux afficheurs, des isolateurs aux interfaces SI, jusqu'aux modules universels. Vous pouvez compter sur nos produits même dans les conditions d'utilisation sévères, p.ex. bruit électrique, vibrations et fluctuations de température. Tous nos produits sont conformes aux normes internationales les plus strictes. Notre devise »SIGNALS the BEST« c'est notre ligne de conduite - et pour vous l'assurance de la meilleure qualité.

DE ▶ PR electronics A/S verfügt über ein breites Produktprogramm an analogen und digitalen Signalverarbeitungsmodule für die industrielle Automatisierung. Dieses Programm umfasst Displays, Temperaturtransmitter, Ex- und galvanische Signaltrenner, und Universalgeräte. Sie können unsere Geräte auch unter extremen Einsatzbedingungen wie elektrisches Rauschen, Erschütterungen und Temperaturschwingungen vertrauen, und alle Produkte von PR electronics werden in Übereinstimmung mit den strengsten internationalen Normen produziert. »Signals the Best« ist Ihre Garantie für Qualität!

(1240)

UNIVERSAL SIGNAL TRANSMITTER

4104

CONTENTS

WARNING

GENERAL

This device is 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 guide must be observed and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following.

Prior to the commissioning of the device, this installation guide must be examined carefully.

Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

WARNING

HAZARD-OUS VOLTAGE

Until the device is fixed, do not connect hazardous voltages to the device. The following operations should only be carried out on a disconnected device and under ESD safe conditions:
General mounting, connection and disconnection of wires.
Troubleshooting the device.
Repair of the device must be done by PR electronics A/S only.

WARNING

CAUTION

Do not open the front plate of the device as this will cause damage to the connector for the display / programming front PR 4501. This device contains no DIP-switches or jumpers.
SYSTEM 4000 must be mounted on a DIN rail according to DIN EN 60715.

SYMBOL IDENTIFICATION

⚠ **Triangle with an exclamation mark**: Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage.

$C\epsilon$ **The CE mark** proves the compliance of the device with the essential requirements of the directives.

▣ **The double insulation symbol** shows that the device is protected by double or reinforced insulation.

SAFETY INSTRUCTIONS

RECEIPT AND UNPACKING

Unpack the device without damaging it. 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.
Installation Category II, Pollution Degree 2, and Insulation Class II.
The module is designed to be safe at least under an altitude up to 2 000 m.

MOUNTING

Only qualified technicians who are familiar with the technical terms, warnings, and instructions in this installation guide and who are able to follow these should connect the device.
Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively, **PR electronics A/S.**
Mounting and connection of the device should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location. Descriptions of input / output and supply connections are shown in this installation guide and on the side label.
The following apply to fixed hazardous voltages-connected devices:
The max. protective fuse is 10 A. A power switch shall be easily accessible and close to the device. The power switch shall be marked as the disconnecting unit for the device.

UL installation

Use 60/75°C copper conductors only.
For use only in pollution degree 2 or better.
Max. ambient temperature..........................60°C
Max. wire size.. AWG 26-14
UL file number... E231911

Calibration and adjustment

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

Cleaning

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

EC DECLARATION OF CONFORMITY

As manufacturer

PR electronics A/S
Lerbakken 10
DK-8410 Rønde

hereby declares that the following product:

Type: 4104
Name: Universal signal transmitter

is in conformity with the following directives and standards:

The EMC Directive 2004/108/EC and later amendments

EN 61326-1

For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The Low Voltage Directive 2006/95/EC and later amendments

EN 61010-1

Rønde, 1 October 2012

Kim Rasmussen
Manufacturer's signature

HOW TO DEMOUNT SYSTEM 4000

Picture 1:

Detach the device from the DIN rail by lifting the bottom lock.
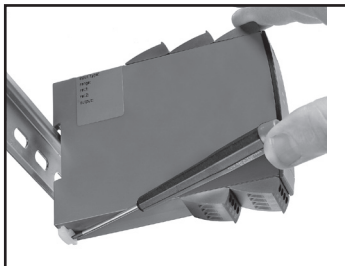
When front LED flashes red / 4501 display shows AO.ER

PR 4104 is designed as a device 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 analogue output current is 0 mA (can e.g. be caused by an open output loop), an error mode switches on the red front LED and the 4501 display shows AO.ER. This function is not a default option but must be actively selected in the menu by programming the analogue output to S4-20. The error mode can only be reset by switching off and then switching on the supply voltage to the device.

UNIVERSAL SIGNAL TRANSMITTER
4104

- *Input and output of uni-/bipolar voltage and current signals for isolation and conversion applications*
- *Handles both active and passive signals on input and output*
- *Fully programmable and live process signal monitoring via 4501 display*
- *Fast response time < 20 ms and excellent conversion accuracy < 0.05% of selected range*
- *Universal supply voltage, 21.6…253 VAC / 19.2...300 VDC*

Applications

- The 4104 is a unique signal isolator and converter for unipolar and bipolar voltage and current signals.

- The unit combines digital and analogues techniques in signal conversion applications and is ideal for galvanic signal separation and measurement of floating signals.

- Process control is possible using the unipolar/bipolar analogue voltage and current output.

- The analogue output can be set to either active current or passive 2-wire output.

- The analogue output signal is linear and selectable as direct or inverted but can also be set to "V" curve function, 100 - 0 - 100% on the basis of a linear 0 - 100% input signal.

Technical characteristics

- All programming is carried out using the detachable 4501 display which can additionally monitor and indicate operation status of the process signal.

- The 4104 input offers auxiliary supply for both 2-wire (>16 V) and 3-wire transmitters (>18 V).

- The unit has a very fast signal response time < 20 ms combined with an excellent conversion accuracy of better than 0.05% of selected range.

- The analogue output signal can be damped from 0.0…60.0 s and additionally has a very high load capability of up to 800 ohm.

- Meeting the NAMUR NE21 recommendations, the 4104 ensures top measurement performance in harsh EMC environments. Additionally, the 4104 meets NAMUR NE43 recommendations.

- High 3-port 2.3 kVAC galvanic isolation and an excellent signal/noise ratio > 60 dB.

Mounting / installation

- A very low power consumption allows for tight DIN rail mounting in Safe area or in Zone 2 / Cl. 1 Div. 2.

- Approved for marine applications.

- Programming, signal monitoring and a 2-point process calibration is possible via the 4501 detachable display.

- All programming can be protected by a user password.

PR 4501 DISPLAY / PROGRAMMING FRONT

Functionality

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

Mounting / installation

• 4501 is a detachable display that can be mounted on the 4104 front for programming and signal monitoring.

Application

• Communications interface for modification of operational parameters in 4104.
• When mounted in the process, the display shows process values and device status.

Technical characteristics

• LCD display with 4 lines: Line 1 (H=5.57 mm) shows the scaled process value - OK or error. Line 2 (H=3.33 mm) shows the selected engineering unit. Line 3 (H=3.33 mm) shows analogue output or TAG no. Line 4 shows status for communication and signal trending.

• Programming access can be blocked by assigning a password. 4501 can be moved from one device to another. The configuration of the first transmitter can be saved and downloaded to subsequent transmitters.

CONNECTIONS

Input signals:
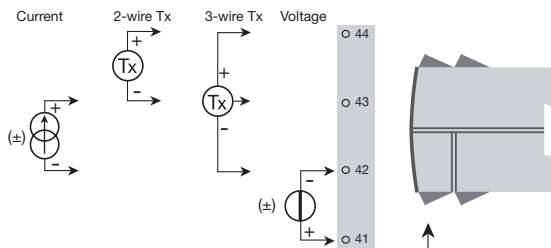
Output signals:
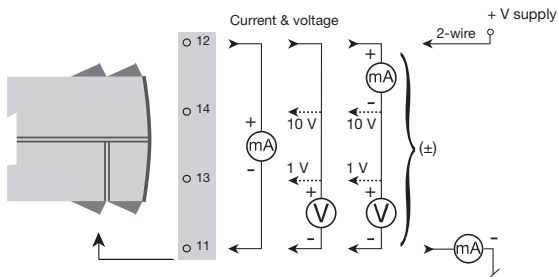
Supply:
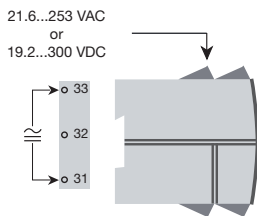
Safe Area or
Zone 2 / Cl. 1, Div. 2, gr. A-D

Order codes
4104 = Universal signal transmitter
4501 = Display / programming front

Specifications

Environmental conditions:

Specifications range.................................... -20°C to +60°C
Storage temperature .... -20°C to +85°C
Calibration temperature............................... 20...28°C
Relative humidity.. < 95% RH (non-cond.)
Protection degree.. IP20
Installation in pollution degree 2 & measurement / overvoltage category II.

Mechanical specifications:

Dimensions (HxWxD)................................... 109 x 23.5 x 104 mm
Dimensions (HxWxD) w/ 4501 display........ 109 x 23.5 x 116 mm
Weight approx. .... 250 g
DIN rail type... DIN EN 60715 - 35 mm
Wire size.. 0.13...2.08 mm^2 /
                                                                         AWG 26...14 stranded wire
Screw terminal torque................................. 0.5 Nm

Common electrical specifications:

Supply voltage, universal .... 21.6...253 VAC, 50...60 Hz
                                                                         or 19.2...300 VDC
Power consumption .... ≤ 2.5 W
Internal power dissipation............................ ≤ 2.0 W
Isolation voltage - test / working .... 2.3 kVAC / 250 VAC
MTBF, acc. to IEC 61709 (SN29500) .... > 111 years
Signal / noise ratio .... > 60 dB
Cut-off frequency (3 dB)............................. > 40 Hz
Response time (0...90%, 100...10%) .... < 20 ms

Accuracy values		
Input	Absolute accuracy	Temperature coefficient
All	≤ ±0.05% of span	≤ ±0.01% of span / °C

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

of span = of selected range

Input specifications:

Current input:
Signal range .... ±23 mA
Programmable measurement ranges.......... 0-20, 4-20, ±10, ±20 mA
Input voltage drop, nom............................. 1.4 V @ 20 mA
Loop error detection, 4...20 mA:
   Low detection .... < 3.6 mA
   High detection .... > 21 mA
2-wire loop supply, (terminal 43 & 44)........ > 16 V / 20 mA
3-wire loop supply, (terminal 42 & 44)........ > 18 V / 20 mA
Loop supply limitation, terminal 44, nom.... 30 mA

Voltage input:
Signal range .... ±12 V
Programmable measurement ranges.......... 0-1, 0.2-1, 0-5, 1-5, 0-10, 2-10 V,
                                                   ±1, ±5 and ±10V
Input resistance, nom................................. 2 MΩ

Current output specifications:

Active unipolar and bipolar mA:
Programmable ranges................................. 0-20, 4-20, ±10 and ±20 mA
                                                   Direct or Inverted action
V-curve function, 100-0-100%.................... 20-0-20 mA
Load, max. .... 800 Ω / ± 16 V @ ±20 mA

Passive 2-wire mA:

Programmable ranges................................. 0-20 and 4-20 mA
Direct or Inverted action
V-curve function, 100-0-100% .... 20-0-20 mA
External 2-wire loop supply .... 3.5 - 26 V

Common specifications current output:

Signal range .... 0...23 mA (unipolar) /
-23...+23 mA (bipolar)
Current limit.. ≤ 28 mA (unipolar) /
±28 mA (bipolar)
Load stability.. ≤ 0.005% of span / 100 Ω
Programmable damping............................. 0.0...60.0 s
Output limitation at outside range:
   on 4...20 and 20...4 mA signals .... 3.8...20.5 mA
   on other unipolar signals........................ 0 and 115% of max. value
   on bipolar signals.................................... ±115% of min. and max. values
Sensor error indication, at 4...20 mA input:
   selectable .... Low, High, Zero or None

Low - corresponds to 0 mA at 0...20 mA and to 3.5 mA at 4...20 mA
High - corresponds to 23 mA at both 0...20 and 4...20 mA
Zero - equals 0 mA output
None - the output state is undefined

Voltage output specifications:

Programmable ranges................................. 0/0.2-1, 0/1-5, 0/2-10, ±1, ±5 and
±10 V - Direct or Inverted action
V-curve function, 100-0-100% .... 1-0-1 V, 5-0-5 V and 10-0-10 V
Load, min .... > 500 kΩ
Programmable damping............................. 0.0...60.0 s
Output limitation at outside range:
   on unipolar signals starting from 0 .... 0 and 115% of max. value
   on unipolar signals with offset .... -5% of min. value and
115% of max. value
   on bipolar signals.................................... ±115% of min. and max. values
Sensor error indication, at 4...20 mA input:
   selectable .... Low, High, Zero or None

Low - corresponds to the selected min range value
High - corresponds to the selected max range value
Zero - equals 0 V output
None - the output state is undefined

Approvals:

EMC 2004/108/EC .... EN 61326-1
LVD 2006/95/EC.. EN 61010-1
UL, Standard for Safety .... UL 508
GOST R

Marine:

Det Norske Veritas, Ships & Offshore .... Pending

Ex:

FM 3025177

4501 display readout of input 4-20 mA loop error detection and signal "outside range"

Input loop error check:		
Device:	Configuration	Input loop error detection
4104	OUT.ERR = NONE.	OFF
	OUT.ERR = DOWN, UP and ZERO	ON

Input loop error detection - readout (LO.ER):			
Input	Range	Readout	Limit
CURR	4..20 mA	LO.ER	<= 3.6 mA; > = 21 mA

Input "outside range" limits - readout (IN.LO, IN.HI):			
Input	Ranges	Readout	Limit
CURR	All - unipolar and bipolar	IN.LO	< -23 mA
		IN.HI	> 23 mA
VOLT	All - unipolar and bipolar	IN.LO	< -12 V
		IN.HI	> 12 V

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

| Readout at hardware error		
Error search	Readout	Error caused by
Check measurement of analogue output - read * note	AO.ER	No load on the current output (only S4...20 mA)
Communications test 4501 / 4104	NO.CO	Connection error
Hardware error - read ** note	FL.ER	Error in FLASH
Configuration error - read ** note	CO.ER	Error in FLASH
Check that saved configuration in 4501 matches device	TY.ER	Invalid type or rev. no
Hardware error - read * note	AO.SU	Analogue output supply err.
Hardware error - read * note	RA.ER	RAM error
Hardware error - read * note	EE.ER	EEPROM error
Hardware error - read * note	AD.ER	A/D converter error
Hardware error - read * note	IF.ER	Flash check sum error

! All error indications flash (1 Hz), and the corresponding helptext is shown. If the error is an input loop error, the display backlight flashes as well - this is acknowledged (stopped) by pushing the OK button.

* Error is acknowledged by either stepping through the basic setup, or by resetting the device power.
  Some types of errors can only be acknowledged by resetting the device power.

** Error is acknowledged by stepping through the basic setup.

BLOCK DIAGRAM
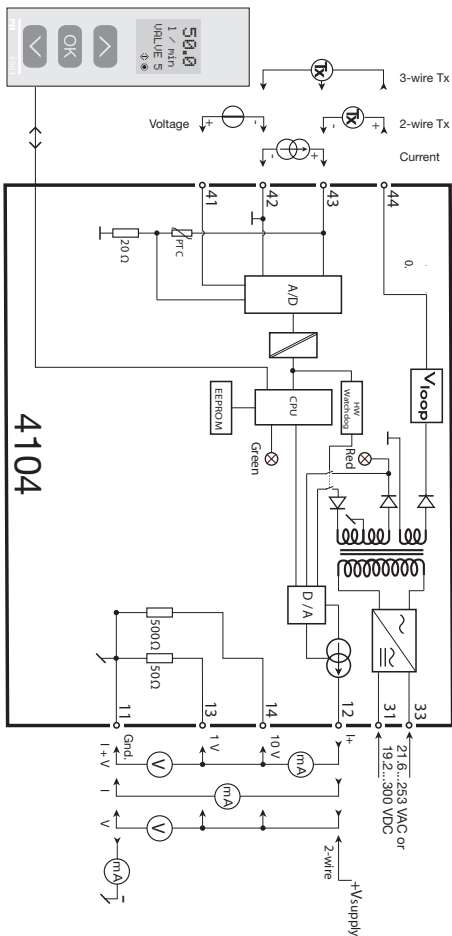
CONFIGURATION /
OPERATING THE FUNCTION KEYS

Documentation for routing diagram.

In general

When configuring the 4104, 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.

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

- $\otimes$ will increase the numerical value or choose the next parameter
- $\odot$ will decrease the numerical value or choose the previous parameter
- $\circledcirc$ will accept the chosen value and proceed to the next menu

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

Pressing and holding $\circledcirc$ 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

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

Signal and loop error info via display front 4501

Input loop error at 4-20 mA signal is displayed as LO.ER (see table page 14). Input signals outside the selected range are displayed as IN.LO indicating low input signal or IN.HI indicating high input signal. (see table page 14). Error indication is displayed in line 1 as text and at the same time the backlight flashes. A flashing bullet in line 4 is indicating correct functioning of 4501.

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.
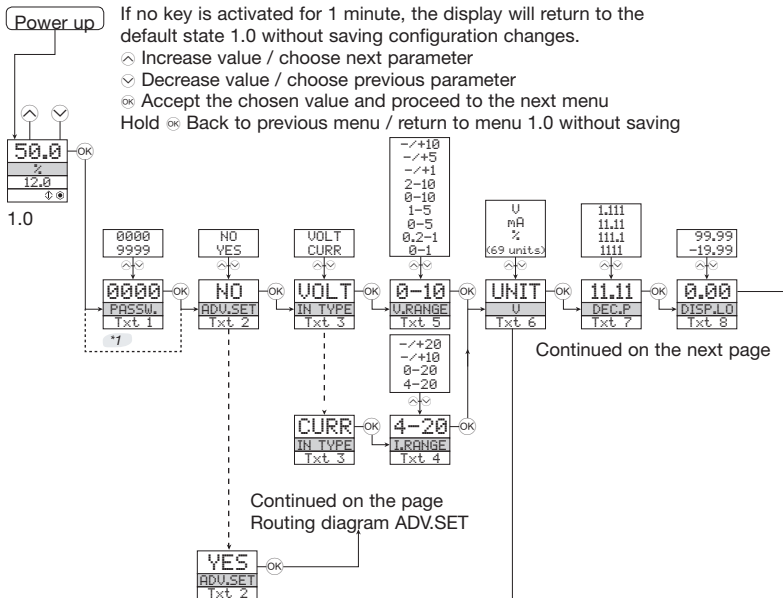Green flashing LED 1 Hz indicates loop error.
Steady green LED indicates internal error.
Steady red LED indicates fatal error.

ROUTING DIAGRAM

Power up

If no key is activated for 1 minute, the display will return to the default state 1.0 without saving configuration changes.

⊙ Increase value / choose next parameter
⊙ Decrease value / choose previous parameter
⊛ Accept the chosen value and proceed to the next menu
Hold ⊛ Back to previous menu / return to menu 1.0 without saving

50.0 —(OK)
%
12.0
1.0

0000 / 9999 — **0000** —(OK) — PASSW. / Txt 1 — *1

NO / YES — **NO** —(OK) — ADV.SET / Txt 2

VOLT / CURR — **VOLT** —(OK) — IN TYPE / Txt 3

−/+10, −/+5, −/+1, 2-10, 0-10, 1-5, 0-5, 0.2-1, 0-1 — **0-10** —(OK) — V.RANGE / Txt 5

V, mA, % (69 units) — **UNIT** —(OK) — U / Txt 6

1.111, 11.11, 111.1, 1111 — **11.11** —(OK) — DEC.P / Txt 7

99.99 / −19.99 — **0.00** —(OK) — DISP.LO / Txt 8

−/+20, −/+10, 0-20, 4-20 — **4-20** —(OK) — I.RANGE / Txt 4
CURR — IN TYPE / Txt 3

Continued on the next page

Continued on the page
Routing diagram ADV.SET

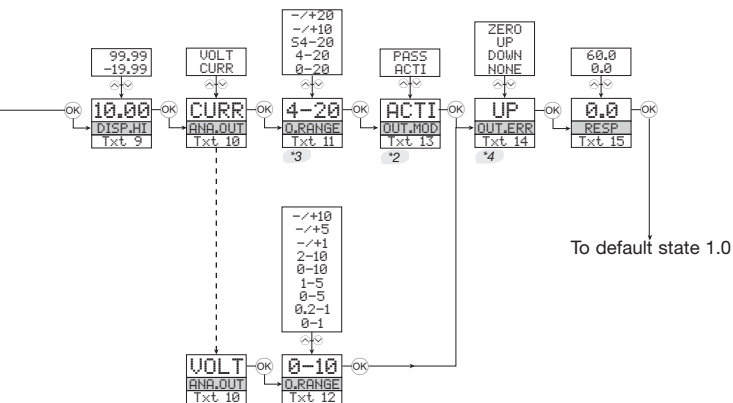**YES** —(OK) — ADV.SET / Txt 2

1.0 = Default state
Line 1 shows input signal.
Line 2 shows UNIT.
By pressing ⊙ and ⊙ simultaneously line 3 alternates between A.Out and TAG.
Line 4 shows trending in the process signal and communication status.

Selectable UNITS:

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

To default state 1.0

*1 Menu only displayed if password is enabled. (EPAS = YES)

*2 Menu not displayed if a Bipolar Output Range is selected.

*3 Direct or Inverted output characteristics must be set in the ADV setting OFUN menu.
    Only ranges starting at zero are available for OFUN = V.FUNC - refer to *7.

*4 Menu only displayed if input type supports sensor error check.

*5 Selectable range as defined by DEC.P, DISP.LO and DISP.HI.

*6 Selectable range equals selected input range.

*7 VFUN (V-shaped output function) is only available when
    an output range starting at zero is selected.
    DIR (direct) and INV (inverted) output characteristics can be
    combined with all selectable output ranges.

ROUTING DIAGRAM

Advanced settings (ADV.SET)

*5 Selectable range as defined by DEC.P, DISP.LO and DISP.HI.

*6 Selectable range equals selected input range.

*7 VFUN (V-shaped output function) is only available when an output range starting at zero is seleceted. DIR (direct) and INV (inverted) output can be combined with all selectable output ranges.
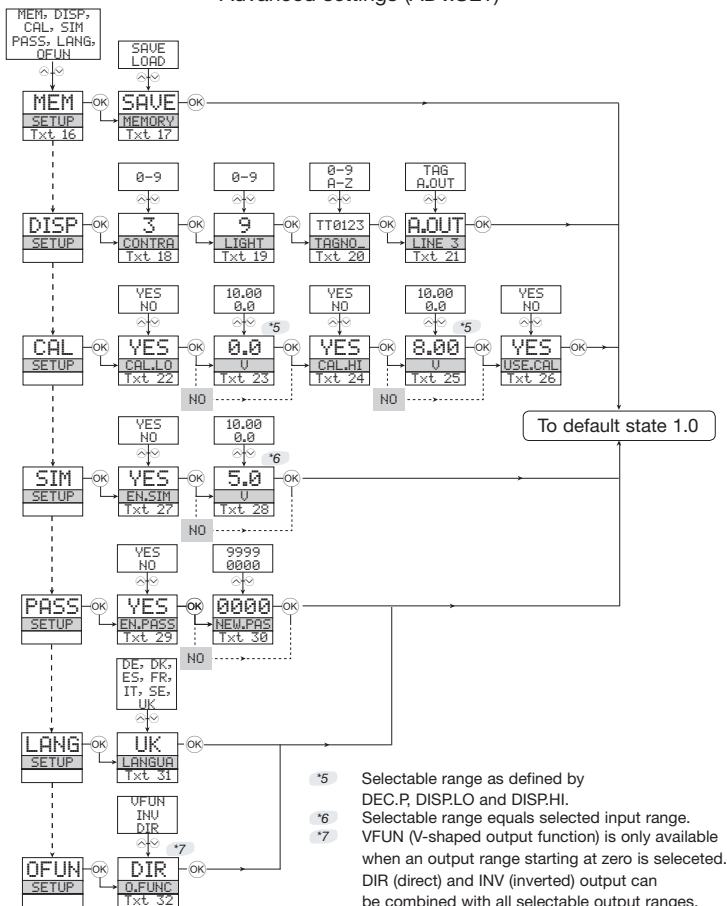
Advanced functions

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

Memory (MEM): In the memory menu you can SAVE the configuration of the device in the 4501, and then move the 4501 onto another device of the same type and LOAD the configuration in the new device.

Display setup (DISP): 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 (CAL): The device can be process-calibrated in 2 points to fit a given input signal. A low input signal (not necessarily 0%) is applied to the input and the actual value is entered via 4501. Then a high signal (not necessarily 100%) is applied and the actual value is entered via 4501. If you accept to use the calibration, the device will work according to this new adjustment. If you later reject this menu point or choose another type of input signal the device will return to factory calibration.

Process simulation function (SIM): 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. You must exit the menu by pressing ⊙ (no time-out).

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

Language (LANG): In this menu 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.

Output Function (OFUN): Here the output characteristics can be set to either Direct (DIR) or Inverted (INV) function. Output type and range are set in the normal programming menu. If the selected output range is starting at zero, V-curved output function (VFUN) can also be selected. The output characteristics will then be 100-0-100% on the basis of a linear 0-100% input signal.

Auto diagnostics

The device performs an advanced auto diagnosis of the internal circuits - check p. 14.

SCROLLING HELP TEXT IN DISPLAY LINE 3

[01] Set correct password
[02] Enter advanced setup menu?
[03] Select current input
    Select voltage input
[04] Select 0...20 mA input range
    Select 4...20 mA input range
    Select -10...10 mA input range
    Select -20...20 mA input range
[05] 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
    Select -1..1 V input range
    Select -5..5 V input range
    Select -10..10 V input range
[06] Select display unit
[07] Select decimal point position
[08] Set display range low
[09] Set display range high
[10] Select current as analog output type
    Select voltage as analog output type
[11] Select 0...20 mA output range
    Select 4...20 mA output range
    Select 4...20 mA with safety readback
    Select -10...10 mA output range
    Select -20...20 mA output range
[12] 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...1 V output range
    Select -5...5 V output range
    Select -10...10 V output range
[13] Select active output mode
    Select passive output mode
[14] Select no error action - output undefined at error
    Select downscale at error
    Select zero output at error
    Select upscale at error
[15] Set Analog output response time in seconds

[16] Select Analog output function
    Enter Language setup
    Enter Password setup
    Enter Simulation mode
    Perform Process calibration
    Enter Display setup
    Perform Memory operations
[17] Load saved configuration into module
    Save configuration in display front
[18] Adjust LCD contrast
[19] Adjust LCD backlight
[20] Write a 6-character device TAG
[21] Analog output value is shown in display line 3
    Device TAG is shown in display line 3
[22] Calibrate Input low to process value?
[23] Set value for low calibration point
[24] Calibrate Input high to process value?
[25] Set value for high calibration point
[26] Use process calibration values
[27] Enable simulation mode?
[28] Set the input simulation value
[29] Enable password protection?
[30] Set new password
[31] Select language
[32] Select direct output mode
    Select inverted output mode
    Select V-function output mode
[33] Display underrange
[34] Display overrange
[35] Input underrange
[36] Input overrange
[37] Analog output supply error
[38] Analog output error
    - check output connections and reset power
[39] Configuration error
    - default configuration is loaded
[40] RAM memory error
[41] EEprom memory error
[42] A/D converter error
[43] No communication
[44] Loop error
[45] Invalid configuration type or version
[46] External flash error
[47] Internal flash error

Displays   Programmable displays with a wide selection of inputs and outputs for display of temperature, volume and weight, etc. Feature linearisation, scaling, and difference measurement functions for programming via PReset software.

Ex interfaces   Interfaces for analogue and digital signals as well as HART® signals between sensors / I/P converters / frequency signals and control systems in Ex zone 0, 1 & 2 and for some devices in zone 20, 21 & 22.

Isolation   Galvanic isolators for analogue and digital signals as well as HART® signals. A wide product range with both loop-powered and universal isolators featuring linearisation, inversion, and scaling of output signals.

Temperature   A wide selection of transmitters for DIN form B mounting and DIN rail devices with analogue and digital bus communication ranging from application-specific to universal transmitters.

Universal   PC or front programmable devices with universal options for input, output and supply. This range offers a number of advanced features such as process calibration, linearisation and auto-diagnosis.

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