AFCM
Universal I/f converter

Model No. AFCM0001
Drawing No. LP1102
Version No. 101
Revision Date 19/06
UNIVERSAL I/f CONVERTER

AFCM

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**WARNING**

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 manual 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 manual 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**

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 Red Lion Controls only.**

**WARNING**

The device must be mounted on a DIN rail according to DIN 46277.

**WARNING**

Do not open the front plate of the device as this will cause damage to the connector for the display / programming front PGM. This device contains 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 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

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. 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 device. Should there be any doubt as to the correct handling of the device, please contact your local distributor or, alternatively,

Red Lion Controls
www.redlion.net
Mounting and connection of the device 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 device 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 Controls that would otherwise exist according to the concluded sales agreement.
HOW TO DISMANTLE THE DEVICE

First, remember to demount the connectors with hazardous voltages.

Picture 1:
Detach the device from the DIN rail by lifting the bottom lock.
UNIVERSAL I/f CONVERTER
AFCM

- Input for RTD, TC, Ohm, potentiometer, mA and V
- Frequency output NPN, PNP and TTL
- Generates frequencies from 0.001...25000 Hz
- 2-wire supply > 16 V
- Universal AC or DC supply

Advanced features

- Programmable by way of detachable display front (PGM), process calibration, signal simulation, password protection, error diagnostics and help text available in several languages.

Application

- Linearised, electronic temperature measurement with RTD or TC sensor.
- Conversion of linear resistance variation to a frequency signal, e.g. from solenoids and butterfly valves or linear movements with attached potentiometer.
- Power supply and signal isolator for 2-wire transmitters.
- Process control by way of a frequency signal transmitted to e.g. a PLC or a process computer.
- Galvanic separation and conversion of analogue signals to frequency signals.

Technical characteristics

- When AFCM is used in combination with the PGM display / programmer front, all operational parameters can be modified to suit any application. As the AFCM is designed with electronic hardware switches, it is not necessary to open the device for setting of DIP-switches.
- A green front LED indicates normal operation.
- Continuous check of vital stored data for safety reasons.
- 3-port 2.3 kVAC galvanic isolation.
PGM DISPLAY / PROGRAMMER FRONT

• PGMMOD00 - Programming Module
• PGMMODC1 - Program/Comms Module

Functionality

The simple and easily understandable 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”.

PGMMOD00

Application

• Communications interface for modification of operational parameters in AFCM.
• Can be moved from one AFCM device to another and download the configuration of the first converter to subsequent converters.
• Fixed display for readout of process data and status.

Technical characteristics

• LCD display with 4 lines; line 1 (H = 5.57 mm) shows input signal, line 2 (H = 3.33 mm) shows units. Line 3 alternates between digital output value and scaling (kHz, Hz, mHz, P/m, P/h, P/d) or shows TAG no. Line 4 shows tendency readout for the input signal and communication status.
• Programming access can be blocked by assigning a password. The password is saved in the converter in order to ensure a high degree of protection against unauthorised modifications to the configuration.

Mounting / installation

• Click PGM onto the front of AFCM.
MOUNTING / DEMOUNTING THE PGMMOD

1: Insert the tabs of PGMMOD into the holes at the top of the device.

2: Swing PGMMOD into place.

Demounting of PGMMOD

3: Push the release button on the bottom of PGMMOD and swing PGMMOD up.

PGMMOD00 shown, PGMMODC1 connects and disconnects in the same way.
APPLICATIONS

Input signals:

Current
Passive Sensor

Voltage

RTD and Lin. R
Connection, wires

TC

Output signals:

Frequency output

PNP, +24 V

NPN, 24 V

Out. Gnd.

TTL, 5 V

Supply:

21.6...253 VAC
or
19.2...300 VDC
**Electrical specifications**
Specifications range ............................................... -20°C to +60°C
Calibration temperature ........................................ 20...28°C
Relative humidity ..................................................... < 95% RH (non-cond.)
Protection degree .................................................... IP20

**Mechanical specifications**
Dimensions (HxBxD) ............................................... 109 x 23.5 x 104 mm
Dimensions, with PGMMOD (HxBxD) ................ 109 x 23.5 x 116 / 131 mm
Weight ................................................................. 155 g
Weight with PGMMOD ............................................ 170 g / 255 g
Max. wire size ........................................................ 1 x 2.5 mm² stranded wire
Screw terminal torque ........................................... 0.5 Nm

**Common specifications**
Supply voltage, universal ..................................... 21.6...253 VAC, 50...60 Hz 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 ................................ Communication enabler PGMMODC1
Signal / noise ratio .............................................. Min. 60 dB (0...100 kHz)
Response time (0...90%, 100...10%), programmable:
  Temperature input ............................................. 1..60 s
  mA / V input ................................................... 0,4..60 s

Accuracy, the greater of the general and basic values:

<table>
<thead>
<tr>
<th>General values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input type</td>
</tr>
<tr>
<td>All</td>
</tr>
</tbody>
</table>
## Basic values

<table>
<thead>
<tr>
<th>Input type</th>
<th>Basic accuracy</th>
<th>Temperature coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>mA</td>
<td>$\leq \pm 4 , \mu A$</td>
<td>$\leq \pm 0.4 , \mu A / ^\circ C$</td>
</tr>
<tr>
<td>Volt</td>
<td>$\leq \pm 20 , \mu V$</td>
<td>$\leq \pm 2 , \mu V / ^\circ C$</td>
</tr>
<tr>
<td>Pt100</td>
<td>$\leq \pm 0.2^\circ C$</td>
<td>$\leq \pm 0.01^\circ C / ^\circ C$</td>
</tr>
<tr>
<td>Linear resistance</td>
<td>$\leq \pm 0.1 , \Omega$</td>
<td>$\leq \pm 0.01 , \Omega / ^\circ C$</td>
</tr>
<tr>
<td>Potentiometer</td>
<td>$\leq \pm 0.1 , \Omega$</td>
<td>$\leq \pm 0.01 , \Omega / ^\circ C$</td>
</tr>
<tr>
<td>TC type: E, J, K, L, N, T, U</td>
<td>$\leq \pm 1^\circ C$</td>
<td>$\leq \pm 0.05^\circ C / ^\circ C$</td>
</tr>
<tr>
<td>TC type: B, R, S, W3, W5, LR</td>
<td>$\leq \pm 2^\circ C$</td>
<td>$\leq \pm 0.2^\circ C / ^\circ C$</td>
</tr>
</tbody>
</table>

### EMC immunity influence

- $< \pm 0.5\%$ of span
- Extended EMC immunity:
  - NAMUR NE 21, A criterion, burst: $< \pm 1\%$ of span

### AUXILIARY SUPPLIES

2-wire supply (terminal 44...43): 25...16 VDC / 0...20 mA

### RTD, linear resistance and potentiometer input:

**Input for RTD types:**
- Pt10, Pt20, Pt50, Pt100, Pt200, Pt250, Pt300, Pt400, Pt500, Pt1000
- Ni50, Ni100, Ni120, Ni1000

<table>
<thead>
<tr>
<th>Input type</th>
<th>Min. value</th>
<th>Max. value</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100</td>
<td>-200°C</td>
<td>+850°C</td>
<td>IEC60751</td>
</tr>
<tr>
<td>Ni100</td>
<td>-60°C</td>
<td>+250°C</td>
<td>DIN 43760</td>
</tr>
<tr>
<td>Lin. resistance</td>
<td>0 Ω</td>
<td>10000 Ω</td>
<td>-</td>
</tr>
<tr>
<td>Potentiometer</td>
<td>10 Ω</td>
<td>100 kΩ</td>
<td>-</td>
</tr>
</tbody>
</table>

### Cable resistance per wire (max.), RTD

- 50 Ω

### Sensor current, RTD

- Nom. 0.2 mA

### Effect of sensor cable resistance

(3- / 4-wire), RTD

- $< 0.002 \, \Omega / \Omega$

### Sensor error detection, RTD

- Yes

### Short circuit detection, RTD

- $< 15 \, \Omega$
## TC input

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

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................................................... -1...25 mA
Programmable measurement ranges........................ 0...20 and 4...20 mA
Input resistance......................................................... Nom. 20 Ω + PTC 50 Ω
Sensor error detection:
  loop break 4...20 mA ......................................... Yes

### Voltage input:
Measurement range................................................... -20 mV...12 VDC
Programmable measurement ranges........................ 0...1 / 0.2...1 / 0...2.5 / 0.5...2.5 / 0...5 / 1...5 / 0...10 and 2...10 VDC
Input resistance......................................................... Nom. 10 MΩ

### Output

#### Frequency output
Frequency range...................................................... 0...25000 Hz
Min. frequency (span)............................................. 0.001 Hz
Duty cycle (0...25000 Hz)................................. 50% or
Programmable pulse time (f ≤ 500 Hz)........... 1...1000 ms (max. 90% duty cycle)
PNP output

\[ I_{out \ max} = 30 \ mA \]
\[ V_{out} = 24 \ VDC \pm 10\% \]
\[ C_{out} = 10 \ nF \]
\[ R_{out \ typ} = 20 \ \Omega \]

Electromechanical counter

\[ 24 \ V / 135 \ mA / 20 \ ms / \leq 10 \ Hz \]

NPN output

\[ I_{sink \ max} = 150 \ mA \]
\[ I_{sink \ max. \ peak} = 300 \ mA \]
\[ V_{out \ max. \ peak} = 55 \ VDC \]
\[ C_{out} = 10 \ nF \]
\[ R_{out \ typ} = 10 \ \Omega \]

TTL output

\[ I_{sink/source \ max} = 15 \ mA \]
\[ I_{sink/source \ peak} = 100 \ mA \]
\[ V_{out} = 5 \ V \pm 5\% \]
\[ C_{out} = 10 \ nF \]
\[ R_{out \ typ} = 55 \ \Omega \]

Sensor error detection

Programmable

\[ 0...26250 \ Hz \]

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

\[ 60^\circ C \]

Observed authority requirements

Standard

EMC 2014/30/UE

EN 61326-1

LVD 2014/35/UE

EN 61010-1

FM

3600, 3611, 3810 and ISA 82.02.01

UL, Standard for Safety

UL 6101-1, 3rd Edition

of span = of the currently selected measurement range
Configuration of sensor error detection

<table>
<thead>
<tr>
<th>Module:</th>
<th>Configuration</th>
<th>Sensor error detection:</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFCM</td>
<td>OUT.ERR=NO</td>
<td>OFF</td>
</tr>
<tr>
<td>Else:</td>
<td></td>
<td>ON</td>
</tr>
</tbody>
</table>

Display readout on the PGM
Display outside range

Display readout below min. / above max. (-1999, 9999):

<table>
<thead>
<tr>
<th>Input</th>
<th>Range</th>
<th>Flashing readout</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>All</td>
<td>-1999</td>
<td>Display readout &lt; -1999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9999</td>
<td>Display readout &gt; 9999</td>
</tr>
</tbody>
</table>
Sensor error detection limits

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

Signal conditioning limits

<table>
<thead>
<tr>
<th>Input</th>
<th>Range</th>
<th>Readout</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLT</td>
<td>0...1 V / 0.2...1 V</td>
<td>IN.LO</td>
<td>&lt; -25 mV</td>
</tr>
<tr>
<td></td>
<td>0...2.5 / 0.5...2.5 / 0...5 V / 1...5 V / 0...10 V / 2...10 V</td>
<td>IN.LO</td>
<td>&lt; -25 mV</td>
</tr>
<tr>
<td></td>
<td>IN.HI</td>
<td>IN.HI</td>
<td>&gt; 1.2 V</td>
</tr>
<tr>
<td>CURR</td>
<td>0...20 mA / 4...20 mA</td>
<td>IN.LO</td>
<td>&lt; -1.05 mA</td>
</tr>
<tr>
<td></td>
<td>IN.HI</td>
<td>IN.HI</td>
<td>&gt; 25.05 mA</td>
</tr>
<tr>
<td>LIN.R</td>
<td>0...800 Ω</td>
<td>IN.LO</td>
<td>&lt; 0 Ω</td>
</tr>
<tr>
<td></td>
<td>IN.HI</td>
<td>IN.HI</td>
<td>&gt; 1075 Ω</td>
</tr>
<tr>
<td>POTM</td>
<td>Min. readout = 0%, Max. readout = 100%</td>
<td>IN.LO</td>
<td>&lt; -0.5 %</td>
</tr>
<tr>
<td></td>
<td>IN.HI</td>
<td>IN.HI</td>
<td>&gt; 100.5 %</td>
</tr>
<tr>
<td>TEMP</td>
<td>TC / RTD</td>
<td>IN.LO</td>
<td>&lt; temperature range -2°C</td>
</tr>
<tr>
<td></td>
<td>IN.HI</td>
<td>IN.HI</td>
<td>&gt; temperature range +2°C</td>
</tr>
</tbody>
</table>

Error indications

<table>
<thead>
<tr>
<th>Readout at hardware error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error search</td>
</tr>
<tr>
<td>Test of internal CJC sensor</td>
</tr>
<tr>
<td>Checksum test of the configuration in FLASH</td>
</tr>
<tr>
<td>Communications test PGM / AFCM</td>
</tr>
<tr>
<td>Check that input signal matches input configuration</td>
</tr>
<tr>
<td>Check that saved configuration in PGM matches module</td>
</tr>
</tbody>
</table>

All error indications 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 module.
CONNECTIONS

Supply:

Polarity is reversible.

Inputs

- RTD, 2-wire
- RTD, 3- / 4-wire
- Resistance, 3- / 4-wire
- Potentiometer
- 2-wire transmitter
- Voltage
- TC
- Resistance, 2-wire
- Current

Outputs

- TTL
- NPN
- PNP

+5 V Gnd.

Passive Sensor

Active Output

LP1102
LP1102 19
CONFIGURATION / OPERATING THE FUNCTION KEYS

Documentation for routing diagram.

In general

When configuring the AFCM, 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 using the 3 function keys:

- **^** will increase the numerical value or choose the next parameter
- **▼** will decrease the numerical value or choose the previous parameter
- **حفظ** will save the chosen value and proceed to the next menu

When configuration is completed, the display will return to the default state 1.0. See the reference diagram beginning on page 23.

Pressing and holding **حفظ** 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 converter 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 sensor error info via display front PGM

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 COM (flashing bullet) indicating correct functioning of PGM and arrow up/down which indicates tendency readout of the input signal.

Signal and sensor error indication without display front

Status of the unit can also be read from the 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 green LED indicates internal error.

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 readout in line 3 of the display. This line can either show the digital output or the TAG number.

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 say “Yes” 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 and down. When you finalise the point with the unit returns to normal mode.

Password: Here you can choose a password between 0000 and 9999 in order to protect the unit against unauthorised modifications to the configuration. 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 be displayed in the front unit PGMMOD00.

CJ.ER - CJC sensor defect or CJC temperature outside range
FL.ER - Flash error
NO.CO - Connection error
IN.ER - Error levels on input
TY.ER - Configuration in PGM does not match this product type

Selection of units

After choosing the input signal type you can choose the process units which will be shown in the display (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.
ROUTING DIAGRAM

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
Save the chosen value and proceed to the next menu
Hold Back to previous menu / return to menu 1.0 without saving

1.0 = Default state.
Line 1 shows input signal.
Line 2 shows UNITS.
By pressing ▲ and ● simultaneously line 3 alternates between f_OUT and TAG.
Line 4 shows communication status.

1.1 = Only if password-protected.
1.2 = Not valid for these input signals: 0...20 mA and voltage.
1.3 = Only if input signal is temperature.
1.2 = Not valid for these input signals: 0...20 mA and voltage.
1.3 = Only if input signal is temperature.
2.0 In the submenu simulation (SIM) you must press OK to return to the default state 1.0.
### SCROLLING HELP TEXT IN DISPLAY LINE 3

| [01] Set correct password | [19] Select 50% duty cycle output |
| [02] Enter advanced setup menu? | Select programmable pulse time |
| [03] Select temperature input | [20] Select Hz as output unit |
| Select potentiometer input | Select pulses/minute as output unit |
| Select linear resistance input | Select pulses/hour as output unit |
| Select current input | Select pulses/day as output unit |
| Select voltage input | [21] Set output frequency for 0% input |
| [04] Select 0.0-1 V input range | [22] Set output frequency for 100% input |
| Select 0.2-1 V input range | [23] Set low cut-off frequency |
| Select 0.5-2.5 V input range | [24] Set pulse time in milliseconds |
| Select 0-5 V input range | [25] Select no error action - output undefined at error |
| Select 1-5 V input range | Set output at specific frequency on input error |
| Select 0-10 V input range | [26] Set output frequency on input error |
| Select 2-10 V input range | [40] Set response time in seconds |
| [05] Select 0-20 mA input range | [41] Set temperature for frequency output low |
| Select 4-20 mA input range | [42] Set temperature for frequency output high |
| [06] Select 2-wire sensor connection | [43] Enter language setup |
| Select 3-wire sensor connection | Enter password setup |
| Select 4-wire sensor connection | Enter simulation mode |
| [07] Set 0% resistance value | Perform process calibration |
| [08] Set 100% resistance value | Enter display setup |
| [09] Select Celsius as temperature unit | Perform memory operations |
| Select Fahrenheit as temperature unit | [44] Load saved configuration into module |
| Select Fahrenheit as temperature unit | Save configuration in display front |
| [10] Select TC sensor type | [45] Adjust LCD contrast |
| Select Ni sensor type | [46] Adjust LCD backlight |
| Select Pt sensor type | [47] Write a 6-character device TAG |
| [11] Select display unit | [48] Output frequency is shown in display line 3 |
| [12] Select decimal point position | Device TAG is shown in display line 3 |
| [13] Set display readout low | [49] Calibrate input low to process value? |
| [14] Set display readout high | [50] Calibrate input high to process value? |
| [15] Select Pt10 as sensor type | [51] Enter simulation mode? |
| Select Pt20 as sensor type | [52] Simulate input value |
| Select Pt50 as sensor type | [54] Enable password protection? |
| Select Pt100 as sensor type | [55] Set new password |
| Select Pt200 as sensor type | [59] Select language |
| Select Pt250 as sensor type | [60] Use process calibration values? |
| Select Pt300 as sensor type | [61] Set value for low calibration point |
| Select Pt400 as sensor type | [62] Set value for high calibration point |
| 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 | |
### Ordering information

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog to Freq. Converter</td>
<td>AFCM0000</td>
</tr>
<tr>
<td>Programming Module</td>
<td>PGMMOD00</td>
</tr>
<tr>
<td>Program/Comms Module</td>
<td>PGMMODC1</td>
</tr>
</tbody>
</table>