

# PM10OUT2A card

## Manual

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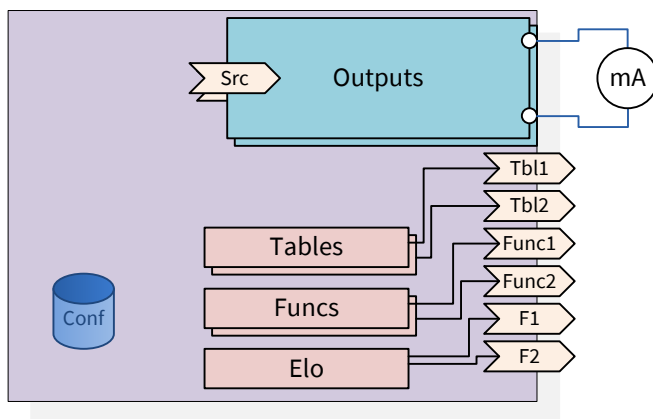
# Introduction

PM10OUT2A is a dual-channel analog output card to the PM10 panel meter series and compatible series. It can generate two current or voltage signals.

This manual covers the PM10OUT2A card only. The rest of the device is explained in the device manual (e.g. PM10A manual).

PM10OUT2A uses the [FreeRTOS](#) real-time operating system V8.0.1. The FreeRTOS source code is available from [Nokeval support](#) on request.

## The card and the registers



The PM10OUT2A card contains two analog inputs, two table blocks, six function blocks, and an Elo engine. Each of these is configurable, having a submenu of its own in the configuration menu of this card.

The output block is configured to follow any register on any card in the device.

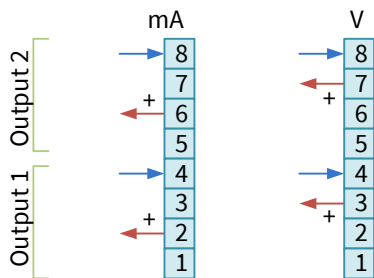
The other blocks publish their output in registers. Each register is an output that can be used (read) by the other blocks on any card.

Register	Description	Block
Tbl1...Tbl4	The outputs of the tables.	Tables
Func1...Func6	The outputs of the function blocks.	Funcs
F1...F12	The Elo variables/outputs.	Elo

The output block is covered by this manual. The other blocks, as being common to many PM10 cards, are instructed in the PM10A manual.

# Outputs

## Connecting the signals



The terminals 4 and 8 are internally interconnected. The outputs are galvanically isolated from the other cards but not from each other.

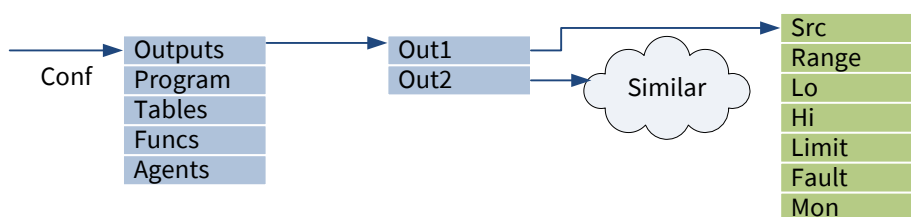
The terminal 1 provides a 15 V 50 mA supply. The terminal 5 is a PNP type input/output, not functional yet.

## Operation

One of the registers on some card is configured as the source of an output channel. Using user configured settings and factory calibration data, a 12-bit digital-to-analog converter is steered. An analog circuitry generates two V or mA signals. Each channel is independent and can have individual configuration and output signal type.

## Configuring the settings

Navigate to the configuration menu of the card and advance to Outputs. It has a submenu for each output channel.



Note that some settings are hidden when not applicable.

Configure:

Src	Select what the output follows or represents. All the registers of every card are available, e.g. an analog input, a table, a setpoint, or a serial bus controlled register.
Range	Select one of the ranges: <ul style="list-style-type: none"><li>0-20mA: The 0-20 mA standard range, scaled with Lo and Hi.</li><li>4-20mA: The 4-20 mA standard range, scaled with Lo and Hi.</li><li>mA: Freely scalable current output.</li><li>0-10V: The 0-10 V standard range, scaled with Lo and Hi.</li></ul>

	<ul style="list-style-type: none"> <li>V: Freely scalable voltage output.</li> </ul>
Lo	The low end scaling on ranges 0-20mA, 4-20mA, and 0-10V. Select the source register value that should produce an output corresponding to the low end of the range (e.g. 4 mA on 4-20mA range).
Hi	The high end scaling.
Limit	<p>If Yes, the output is limited between the scaling points, except when indicating a fault.</p> <p>If No, the output can overrange as much as physically possible (typ 0-11.0 V or 0-22.6 mA), except on the 4-20mA range, the output is limited between 3.8 and 20.5 mA for NAMUR NE 43 compliance.</p>
Fault	<p>The output behavior when the source has a fault, or is not available at all.</p> <ul style="list-style-type: none"> <li>Min: The output will go to its physical minimum, 0 V or 0 mA. Except on the 4-20mA range, the output will go to 3.5 mA for NAMUR NE 43 compliance.</li> <li>Lo: The output will go to the low end scaling point, e.g. 4 mA on 4-20mA range.</li> <li>Hi: The output will go to the high end scaling point, e.g. 20 mA on 4-20mA range.</li> <li>Max: The output will go to its physical maximum, approx. 11.0 V or 22.6 mA. On 4-20mA range, this is NAMUR NE 43 compliant.</li> </ul>
Mon	The output signal in mA or V. Can be manually overridden for testing, see <a href="#">below</a> .

## Inverse output

A 20-0 mA, 20-4 mA, or 10-0 V output is accomplished by swapping the Lo and Hi values.

## Free scaling

The 0-20mA, 4-20mA, and 0-10V outputs are scaled traditionally with the Lo and Hi settings. Any other output range within the physical limits of the output circuitry can be configured using free two-point scaling. To do so:

1. Select Range = mA or V. The new settings Rdg1, Out1, Rdg2, and Out2 will replace Lo and Hi in the menu.
2. Configure the first point: Set any source (engineering) value in Rdg1. Set the corresponding analog output signal (in mA or V) in Out1.
3. Define another point similarly.

## Manual control

For testing purposes, the analog outputs may be controlled manually from the configuration menu.

1. Give a Lock command for the Mon item in the menu. In Mekuwin, click the L button.
2. Enter a value in Mon in milliamps or volts. The analog output will generate that value while within its physical capabilities.
3. Finally restore the normal operation with a Free command. F button in Mekuwin.

# Maintenance

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The card doesn't need regular maintenance. The analog outputs may be recalibrated, when maximum accuracy is desired. For a new and recalibrated card, a calibration certificate can be downloaded from the Nokeval web site.

# Troubleshooting

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# Specifications

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## Environmental

Storage temperature	-40...+70 °C
Operating temperature	-30...+70 °C
Weight	23 g

## Outputs

Galvanic isolation	The cannels share a common ground (minus), but are isolated from the other cards. No hazardous voltage allowed.
Signals	0-20 mA, 4-20 mA, any signal within 0-22 mA, 0-10 V, any signal within 0-11 V.

Signal	Range at least	Max load	Accuracy	Thermal drift	Resolution
mA	0.004...22.0 mA	600 Ω	6 μA		6 μA
V	0.005...10.6 V	10 kΩ	3 mV		3 mV

Response	10 ms fully settled (not including the firmware delays)
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# Warnings

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Read this manual carefully before using the device.



The device must not be disposed with household waste. Observe local regulations concerning electronic waste recycling.

# Manufacturer

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