

Nokeval
Nokeval
FD100A4-2012,
FD100A6-2012
Large Field
Displays



Nokeval FD100A4-2012, FD100A6-2012 Large Field Displays User Manual

[Home](#) » [Nokeval](#) » Nokeval FD100A4-2012, FD100A6-2012 Large Field Displays User Manual 

Contents

- 1 Nokeval FD100A4-2012, FD100A6-2012 Large Field Displays
- 2 Document information
- 3 Introduction
- 4 Mounting
- 5 Symbols and markings
- 6 Power supply connection
- 7 Cards
- 8 User interface
- 9 Configuration state
- 10 Master configuration menu
- 11 Jumper configurations
- 12 Input card 2012-IN
- 13 Output card 2000-OUT
- 14 Serial card 2000-RS
- 15 Relay card 2000-REL2
- 16 Specifications
- 17 Documents / Resources
 - 17.1 References

Nokeval

Nokeval FD100A4-2012, FD100A6-2012 Large Field Displays



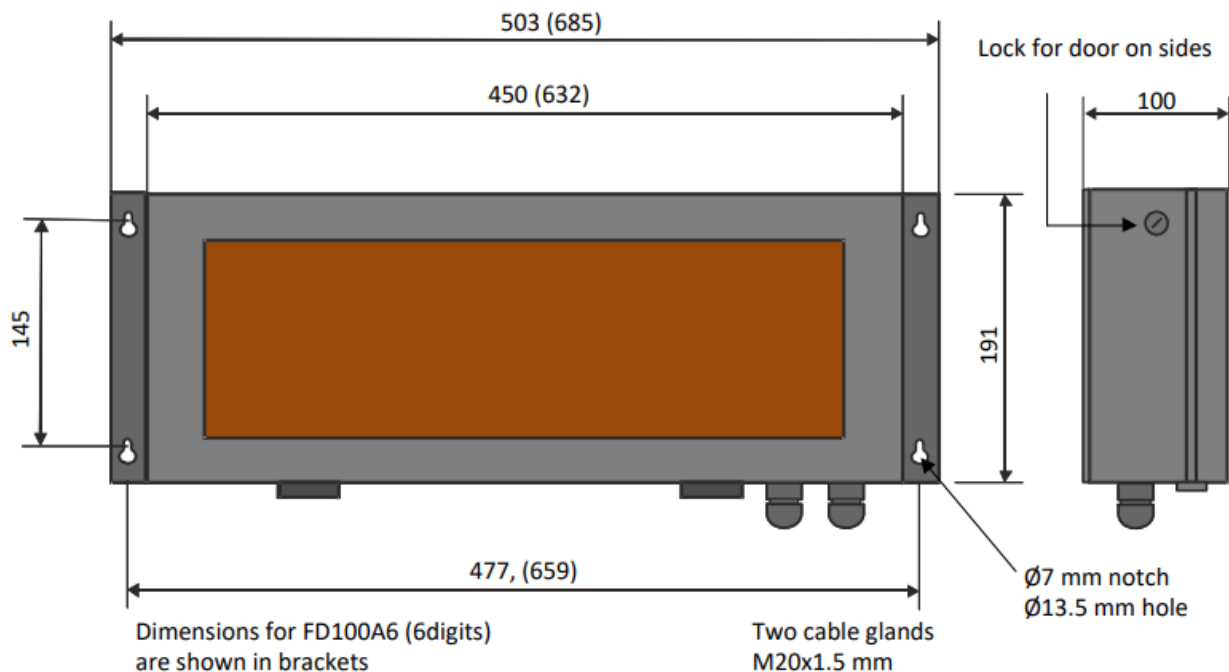
Document information

- Device Scope: FD100A4 (4-digit device) FD100A6 (6-digit device)
- Document ID: 13992
- Document Version: 5
- Document Date: 2.7.2024

Introduction

The FD100 series includes 4 and 6 digit models. Digit size is 100mm. The displays are based on input cards of the panel meter series 2000 giving over 100 combinations. The unit has wide power supply range of 41...265 VAC or 20...28 VAC/VDC depending on model.

Mounting

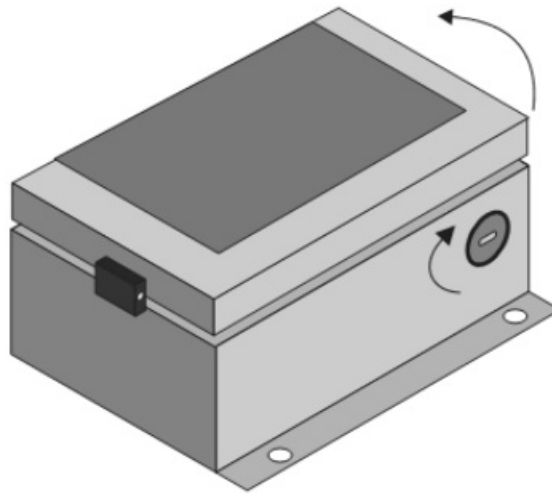


The display unit can be mounted with four screws, one at each corner. The diameter of the screw must be between 5.5 and 6.5 mm. The unit may be mounted to a steel or aluminum structure, to wood with minimum thickness of 20 mm, or to a material of equivalent or better strength.



To op en the case door

There are quick locks on the both sides of the case. The door can be unlocked by turning side locks towards the rear of the case.

Warning! Only a qualified electrician is allowed to open the enclosure.



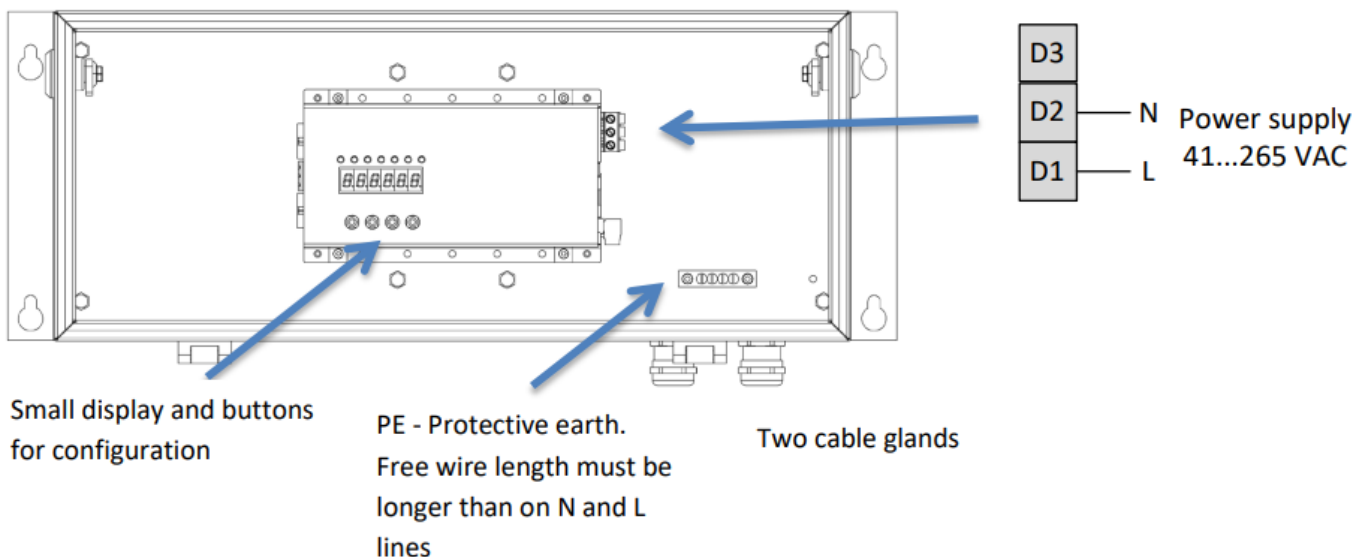
Symbols and markings

-  Protective earth connector
-  Alternating or direct current

Power supply connection

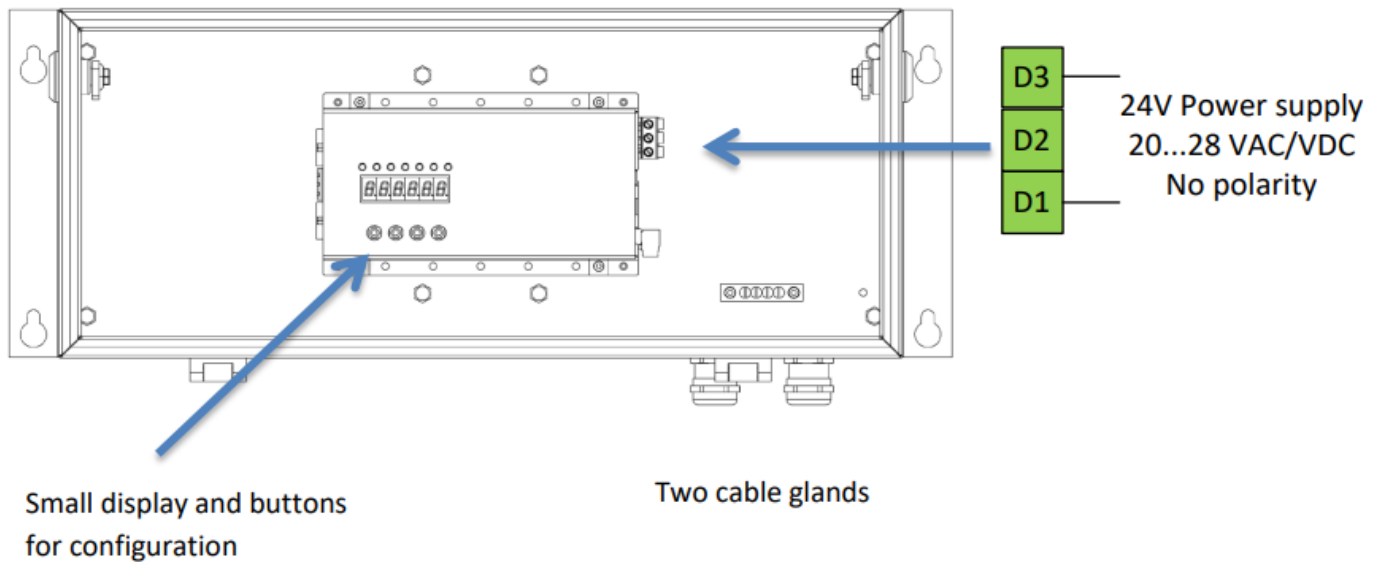
The unit has wide power supply range of 41...265 VAC or 20...28 VAC/VDC depending on model. There are two types of power supply connectors; grey connector color is used to indicate higher voltages and green color to indicate 24 V.

FD100A4-F48/230 and FD100A6-F48/230

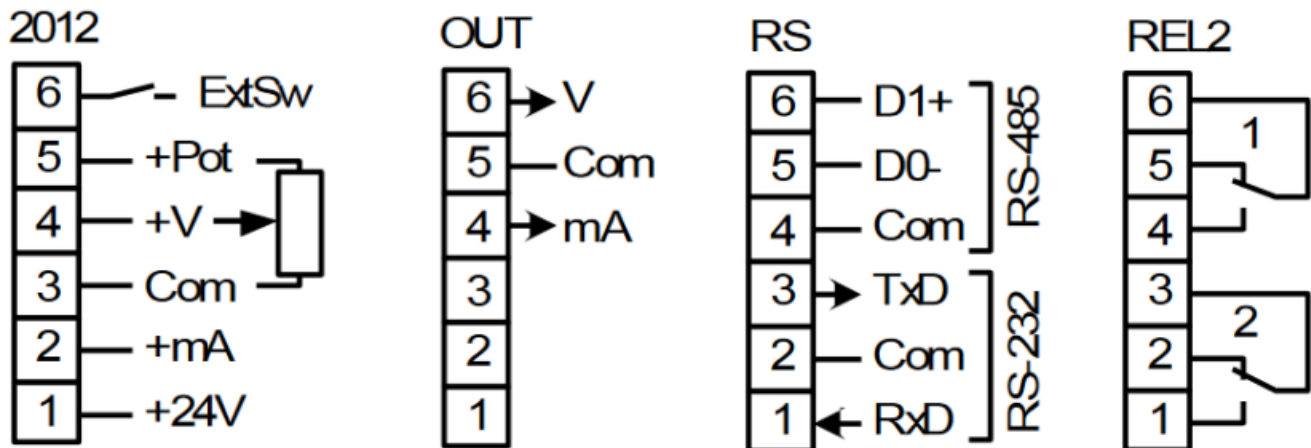


Do not strip the wires more than necessary in order to avoid exposing dangerous voltages. Tie the N and L wires so that if one of them gets accidentally disconnected, the wire end can't reach the other connectors.

FD100A4-F24 and FD100A6-F24



Cards



Configuring

The display unit is configured with the small display and buttons inside the main case. The display can be configured with many ways:

- By using the front panel display and buttons. Using the buttons is described in chapter User interface.
- Via the RS-232 or RS-485 bus. Available only, if the device is equipped with a serial communications card. Use the free Mekuwin software.

User interface

Electronics unit

To reach electronics unit open the main case as explained before. Use the small display and four buttons to configure the display unit.

Electronics unit



The front panel and the small display on large displays can be used to view the readings and to change configuration settings. The user interface has four states:

- Normal state – indicating readings.
- Operator menu – adjusting the alarm levels.
- Configuration state – changing the configuration settings.
- Monitor state – indicating troubleshooting readings.

Normal state and the indicator LEDs

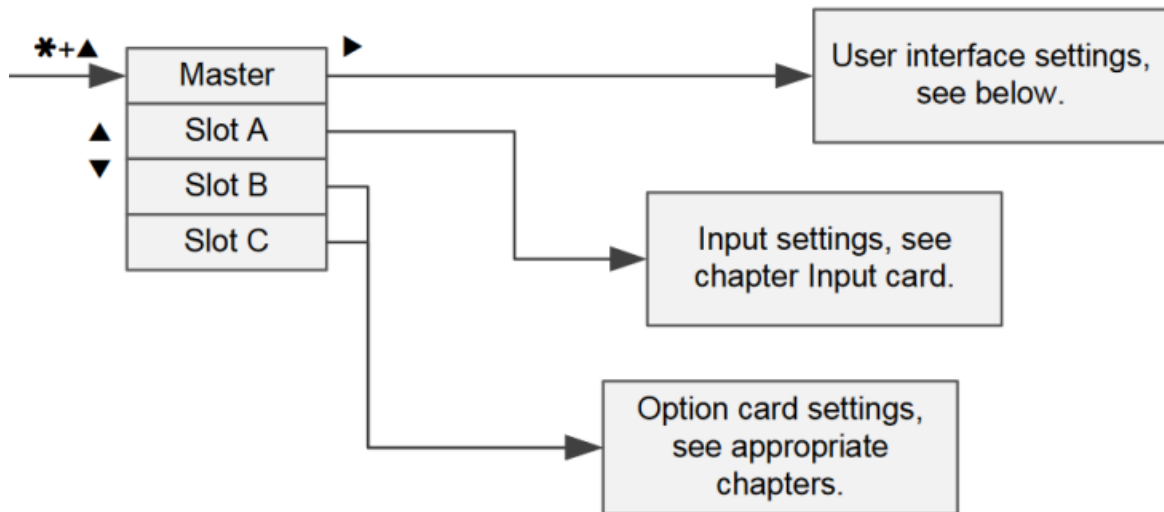
- After switching the power on, the user interface is in normal state, indicating readings. There are three modes for the normal state, selected in the Master configuration menu, item Gen/Mode:
 - Single: Indicates only one pre-selected channel using up to six digits. The channel is selected in the configuration menu Master/Gen/Ch.
 - Step: The leftmost digit on the display indicates a channel number, and the four rightmost digits are indicating the reading of that channel. The channel can be changed manually with buttons ▲ ▼.
 - Scan: Like Step but the displayed channel is automatically stepped once a second.
 - Scan2...Scan5: Like Scan, but slower.
 - Indicator LEDs A1...A4 indicate the state of the alarms on the optional relay card. A1 and A2 follow the alarms on slot C. A3 and A4 follow the alarms on slot B. If the C slot is equipped with a three-relay card, the indicators A1 to A3 are used for it.
 - The alarms can be programmed to blink the display when active.
 - Indicator LED M2 is lit when an external contact connected in slot A is active.
 - Conf LED is lit when the user interface is in the configuration state.
- button may be used to perform taring if configured so on the input card menu, or for resetting the alarms if configured so on the relay card.

Operator menu

- The operator menu allows quickly adjusting the alarm levels on the relay card installed in slot C without entering the configuration state.
- The operator menu is entered from the normal state with the ► button. If a password has been set for the operator menu (Master/Gen/AI Code), it has to be entered now.
- ► button is used to advance from one level setting to another. While the button is kept pressed, the name of the level is displayed, e.g. AL2 = alarm level 2. After the last level, ► returns to the normal state.
- When the level is displayed, it may be edited by pressing either ▲ or ▼. One digit of the display starts blinking

and the level can be edited as described below in section Configuration state, editing floating point numbers. The editing is ended with the * button.

Configuration state



Entering

- In the normal state, press the * and ▲ buttons together two seconds.
- Select the slot to be configured using the ▲ ▼ buttons. The options are Master, Slot A, Slot B, and Slot C. Enter with the ▶ button. The contents of the menu depend on the card type installed, and is described in the chapter of that card type. The Master configurations affect the user interface and the math channel, and are described later in this chapter.
- If a password has been set for the configuration menu, it has to be entered now. The display will show Cod.0 and waits for six button pushes. (If the password is forgotten, it may be reset by keeping * and ▶ pressed while switching the power supply on.)

Navigating

The menu is a hierarchical structure. Within one menu you can move with the ▲ ▼ buttons. A submenu is entered with ▶ and exited with *.

Editing

- Pressing the ▶ button shows the value of the setting and allows editing it. Most data types are edited simply with ▲ ▼ buttons and exited with *.
- Floating point numbers are edited using the buttons ▲ ▼▶. Select the digit to be edited or the decimal point with ▶ and edit it with ▲ ▼. The first digit can be edited to a minus sign.
- Setting passwords: First enable the password by pressing ▲ – Set will be displayed. Then press ▶, and the display shows Cod.0. Enter a series of six button presses using freely the four buttons. Then re-enter the same series. If these matched, Set is displayed again and you may exit with *. The password cannot be *****. The password is disabled by selecting ▼ Off instead of Set.

Lock and Free

- Some items in the configuration and monitor menus accept Lock and Free commands. The purpose of these depend on the menu item.
- The Lock command is given by pressing and holding the ► button and pressing the ▲. Before this, the item name must be in the display, not the value.
- The Free command is given the same way but using ▼ instead of ▲.

Exiting

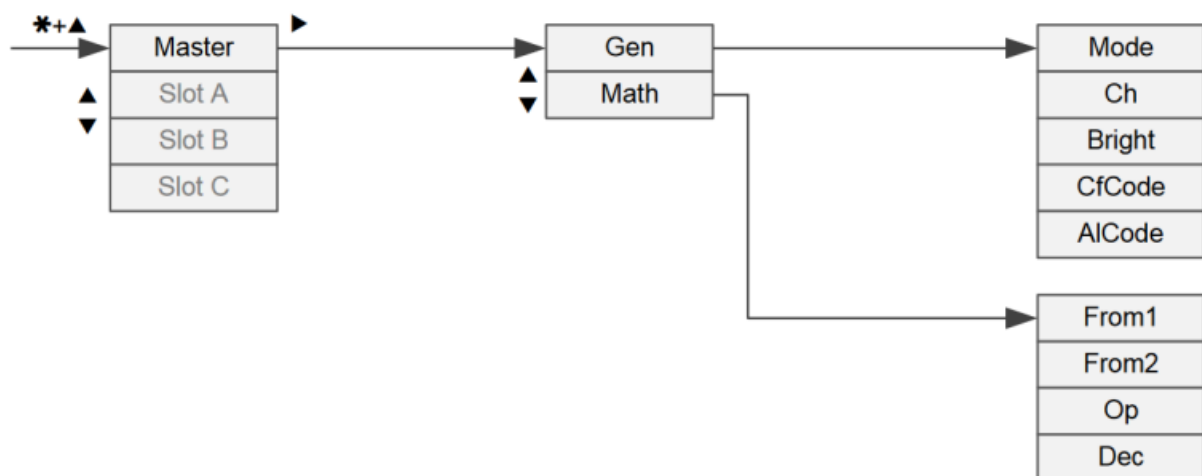
When all is done for this slot, exit from the menu with * button. Select ▲ ▼ Save (keep the changes) or Undo (discard the changes) and press *. You will be in the slot selection menu. Select another slot or exit with * button.

Monitor state

Monitoring means viewing some internal values mainly for testing and troubleshooting.

- The monitoring mode is entered by pressing * and ▼ together. After that, a slot is selected with ▲ ▼ and entered with ►. The monitoring item can be changed with ▲ ▼. The item name and the value are displayed alternating.
- The last item in the monitor menu is Diag, allowing viewing self-diagnostic messages. Press ►. If nothing happens, there is no active messages. If happens, use ▲ ▼ to see if there is more messages. Exit to the monitoring menu with *.
- The monitoring state is exited with *.

Master configuration menu



• Gen/Mode

The display mode in the normal state. The options are described above in section Normal state and the indicator LEDs.

• Gen/Ch

The channel to be displayed in the Single mode. The channels are:

- 1 = slot A reading
- 2 = slot B reading
- 7 = math channel

• Gen/Bright

Display brightness 1...15. Default value 7. Does not affect the brightness of the large displays of models 575F/FD100A/FD200A.

- **Gen/CfCode**

Password for the configurations. If this is set, the same password has to be entered when next time entering the configuration state.

- **Gen/AlCode**

Password for the operator menu. The alarm levels may be quickly accessed from the normal state, but if this password is set, it must be entered first.

- **Math/From1**

The channel to be used as the first operand of the mathematical operation.

- **Math/From2**

The channel to be used as the second operand of the mathematical operation. Not used with the Sqrt function.

- **Math/Op**

Mathematical operation. The result is placed on channel 7. The operation can be one of the following:

- Off: No mathematical operation. Channel 7 is not included in the display scanning in mode Scan.
- Sum: Sum of the channels $\text{From1} + \text{From2}$.
- Avg: Average $(\text{From1} + \text{From2}) / 2$.
- Diff: Difference $\text{From1} - \text{From2}$.
- Mul: Multiplication $\text{From1} * \text{From2}$.
- Div: Division $\text{From1} / \text{From2}$. Dividing by zero will give an undefined result.
- Min: Lesser of the two From1 or From2 .
- Max: greater of the two.
- Sqrt: Square root from the channel selected with From1 . A negative value will give negative results.

Tip: a square of the value can be calculated by selecting Mul operation and setting $\text{From1} = \text{From2}$.

- **Math/Dec**

The number of decimals to be displayed on the math channel.

Master monitor menu

Mainch

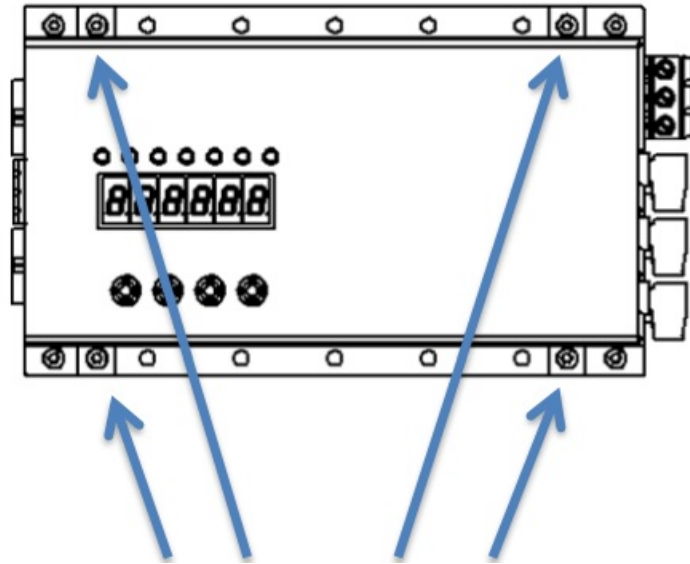
The channel being displayed.

Act

The state of the external contact and the front panel button *.

Jumper configurations

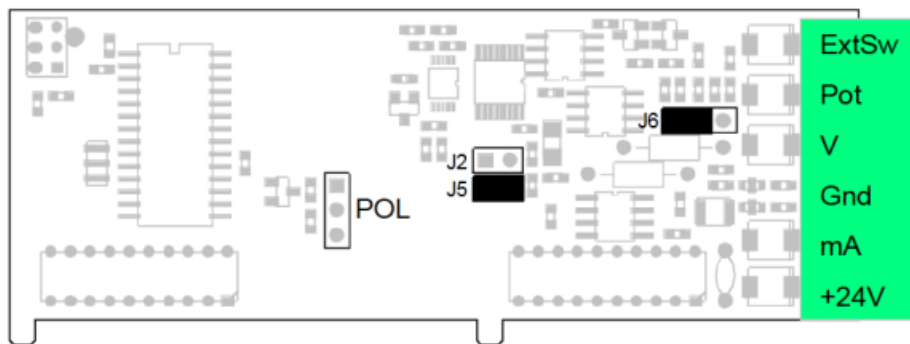
If corresponding 2000-series manual informs that jumpers need to be changed, see below instructions to reach the jumpers.



Input card 2012-IN

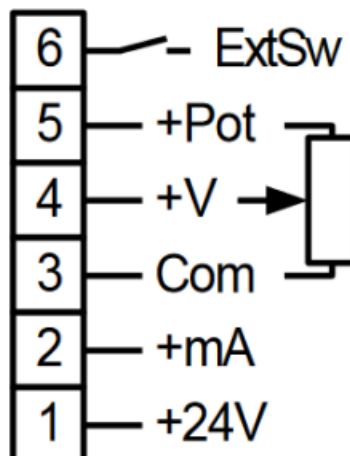
Jumpers

The jumpers are set in factory and there is no need to alter them. The correct positions are shown in the picture.



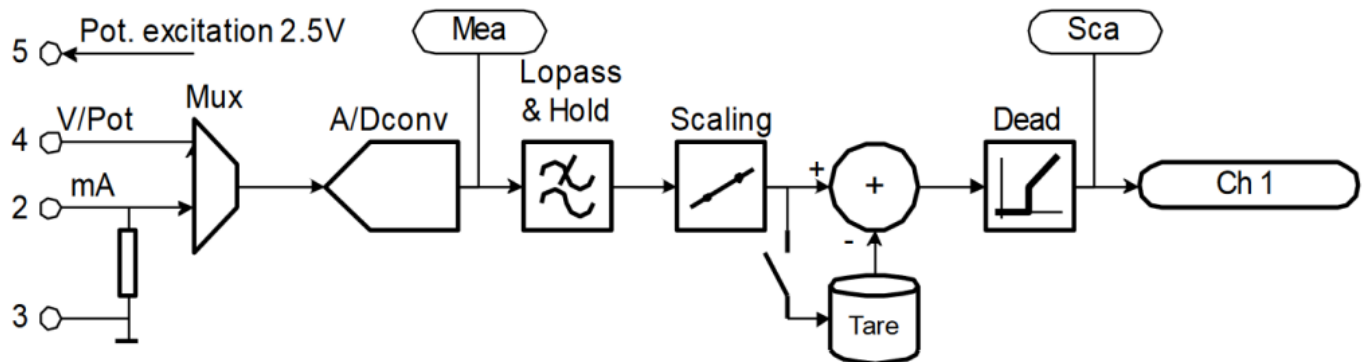
Connections

- A voltage or a current signal can be connected in the input card but not both. A voltage signal is connected in terminals 4+ and 3-.
- An active (=remotely powered) current signal is connected in terminals 2+ and 3-. On 2012-IN card, the current goes through a 50 ohm resistor and approx 30 ohm self-resetting semiconductor fuse.
- The terminals 1+ and 3- provide a 24 VDC supply for a transmitter. A two-wire transmitter is connected in terminals 1+ and 2-.



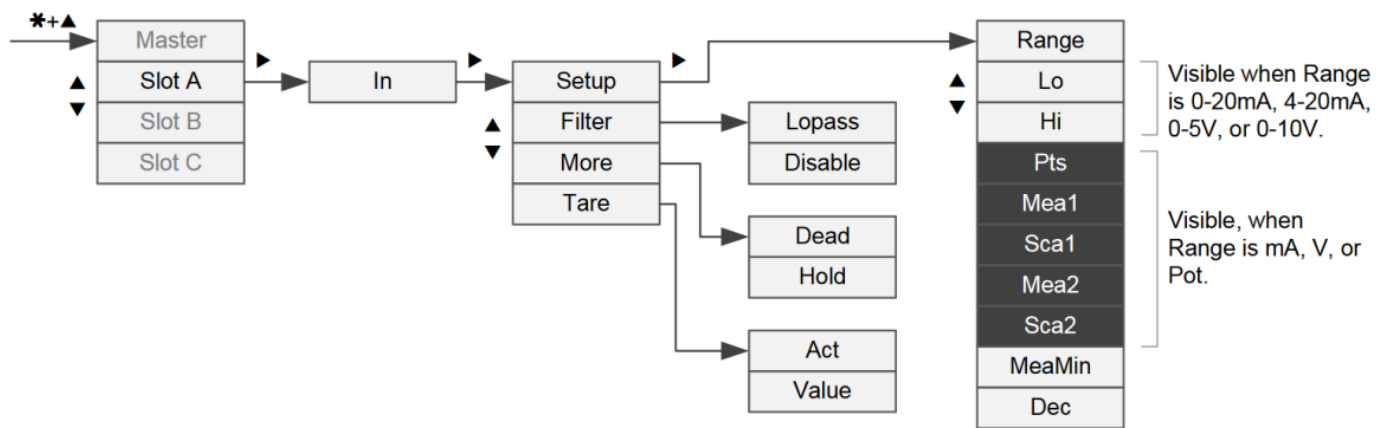
- The potentiometer upper end is connected in terminal 5, feeding 2.5 V excitation. The lower end is connected in 3. The wiper is connected in terminal 4.
- If using two 2012-IN cards, please note that they share the common ground (terminals 3 are internally together).
- An external switch may be connected in terminals 6+ and 3-. This card will pull the terminal 6 voltage to approx +5 V via 10 kohm. The external contact (NPN or mechanical) may then pull this voltage to ground. The switch may be programmed to activate the hold function, tare the input, reset the alarms, or to bypass the lowpass filter.

Operation



- The microcontroller sets the multiplexer “Mux” to measure the V or mA input according to the configuration settings. The input is measured using a 24-bit analog-to-digital converter. The factory-adjusted calibration values are used to convert the result to an accurate mA or V reading. This unprocessed reading can be seen in the monitor menu, item Mea.
- If the digital lowpass filter is enabled, the reading is processed with it. Likewise if the Hold function is active, the reading is locked.
- The reading is scaled using up to ten user-entered scaling points Mea/Sca to a scaled (engineering) reading. If the tare function is active, the current tare value is subtracted. The current value is copied to the tare value memory when a switch programmed as a tare switch is activated. The tare value is stored in an EEPROM memory and is retained even if the power supply is cut off.
- The last element in the chain is Dead zone. It allows rounding very small readings to zero, to get a empty weigh to indicate zero reading despite of a small tare error.
- The reading processed this way is observable in the monitor menu item Sca, and it is also stored to the channel table to be used on the display and analog and serial outputs and alarms. The card in slot A stores the reading to channel 1 and card in slot B to channel 2.

Configuration menu



• In/Setup/Range

Defines the physical input signal type. Contains predefined ranges 0-20mA, 4-20mA, 0-5V, and 0-10V, and free scaling ranges mA, V, and Pot (=potentiometer).

• Predefined ranges

When using one of the predefined ranges 0-20mA, 4-20mA, 0-5V, or 0-10V, the scaling to engineering units is done by giving the scaled endpoints in menu items Lo and Hi. When the input signal is at the low end of the range, the scaled (displayed) reading corresponds to Lo setting.

• Free scaling

- When using free scaling ranges mA, V, or Pot, the In/Setup/Pts setting defines how many scaling points are desired. It can be adjusted from 0 to 10.
- If 0 points is selected, the reading is not scaled at all, but milliamps or volts are displayed as are. A potentiometer will give unscaled readings 0 to 100.
- Two point scaling is achieved by setting Pts to 2. Settings Mea1, Sca1, Mea2, and Sca2 will appear in the menu. Mea1 and Sca1 form a pair: when the physical input signal corresponds to Mea1, the scaled (engineering) reading will be Sca1. The same applies for the other pair, and linear interpolation and extrapolation is used elsewhere.
- An example how to scale 4-20mA signal to be displayed 0-100::
 - Pts=2
 - Mea1 = 4 (mA)
 - Sca1 = 0 (scaled)
 - Mea2 = 20 (mA)
 - Sca2 = 100 (scaled)
- A non-linear behaviour is obtained by using more than two points. The points can be used freely, but the Mea settings must be in ascending order: Mea1 is smaller than Mea2 etc.
- If a Lock command is given to a Mea setting (Mekuwin: L button, user interface: see chapter User interface), the current unscaled reading is copied to the value of this Mea setting. The corresponding desired scaled reading can then be manually entered to the associated Sca setting. This way the scaling may be taught.

• In/Setup/MeaMin

The smallest acceptable signal in milliamps or volts. If the signal goes below this, the reading is considered to indicate fault and dashes are displayed and all alarms following this reading are activated.

For example, with a 4-20mA input signal, it is advisable to set this to 2, so that if the current loop is broken, the alarms are activated.

- **In/Setup/Dec**

The number of decimals to be displayed after the decimal point. If the selected number does not fit in the display, the decimals are automatically temporarily decreased.

If Dec is set negative, no decimals will be displayed, but the last digits are rounded to zero. E.g. if Dec=-1, the display will be rounded to the nearest 10. This affects the display only.

- **In/Filter/Lopass**

Third order digital lowpass filter, that is used to reduce noise and fluctuation in the reading. Set the time constant in seconds – in that time the filter has passed through 63% of a step change. To disable, set to 0.

- **In/Filter/Disable**

Lowpass filter bypass switch selection. The options are:

- Off: Not used.
- FP: Front panel * button works as a bypass switch.
- ExtSw: An external contact connected in slot A works as a bypass switch.
- Both: Both of the above switches work.
- When the selected switch is activated, the lowpass filter is switched off. Can be used, when the input signal is changed and the filtered reading is desired to jump to that.

- **In/More/Dead**

Dead zone around zero. If the absolute value of the scaled reading is smaller than the Dead setting, the reading is rounded to zero. This can be used to get a zero reading in a weigh even if there is a small tare error.

If Dead is set to 0, only negative readings are forced to 0. If Dead is set negative (e.g. -1.0), the function is disabled.

- **In/More/Hold**

Hold switch selection:

- Off: Not used.
- FP: Front panel * button works as a hold switch.
- ExtSw: An external contact connected in slot A works as a hold switch.
- Both: Both of the above switches work.
- While the hold switch is active, the reading is locked and keeps the same value.

- **In/Tare/Act**

Tare switch selection:

- Off: Tare function disabled.
- Front panel * button works as a tare switch.
- ExtSw: An external contact connected in slot A works as a tare switch.
- Both: Both of the above switches work.
- When the tare switch is activated, the current scaled reading is captured and stored in the tare value memory. The tare value will then be subtracted from every reading.
- The tare value is stored in an EEPROM memory and will be retained also when the meter is powered down.
- The tare value is captured and stored only once when the switch is activated. Keeping the switch active will not cause successive tarings.
- If this setting is set to Off, the tare value will not be subtracted from the reading anymore.

Monitor menu

- **Mea**

The unscaled reading in milliamps/volts/percents depending on the input range.

If a Lock command is given to this item, the meter stops updating the Mea value and allows it to be changed manually. This way the operation of the scaling, analog outputs, alarms, etc may be tested with no need to feed in different physical signals. The normal operation is restored with a Free command.

- **Sca**

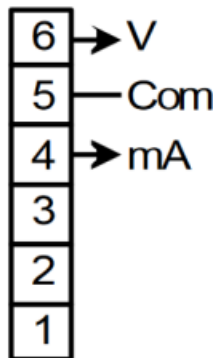
The scaled reading, that has also gone through the lowpass filter, tare subtraction and dead zone function.

- **Diag**

- EEPROM: Not used.
- ADC: The A/D converter is not working. The input card needs service.

Output card 2000-OUT

Connections



- The analog output card provides one mA or V output signal. These cannot be used at the same time.
- The analog output card can be installed in slots B or C or both.
- An active mA output is provided in terminals 4+ and 5-. Voltage output is in terminals 6+ and 5-.

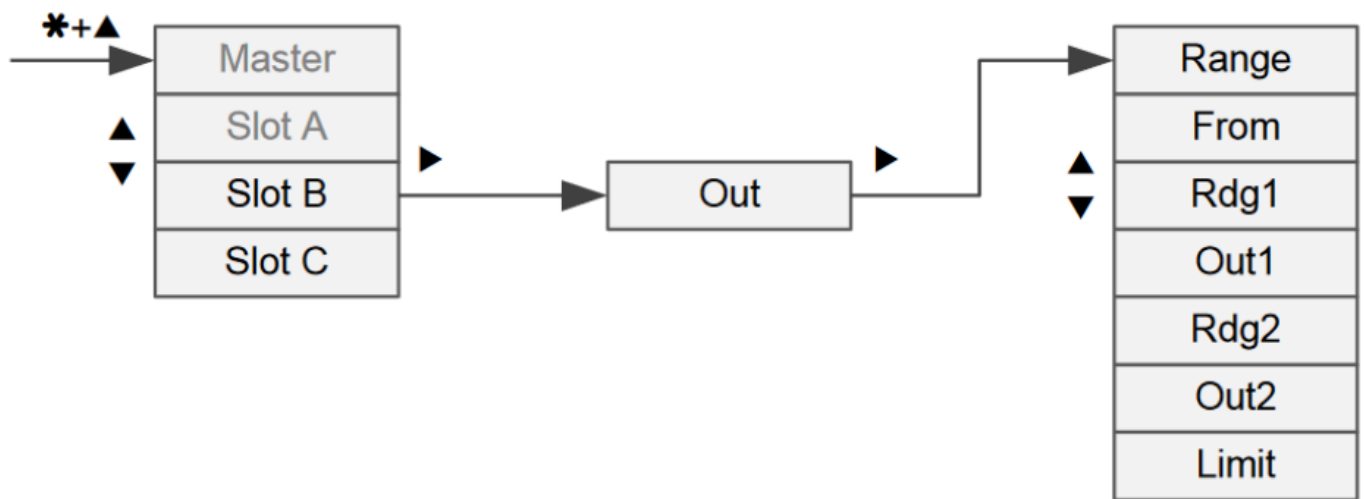
Operation

The analog output is configured to follow any of the channels:

- 1 = slot A input
- 2 = slot B input
- 7 = math channel

The reading of the selected channel is calculated to milliamps or volts using two freely configurable scaling points. If the channel is indicating fault (the input signal is below MeaMin), the analog output is steered to exceed the range by 20% or its electrical maximum 22mA or 11V.

Configuration menu



Out/Range

Output signal type mA or V.

Out/From

What channel the analog output is following:

- 1 = slot A input
- 2 = slot B input
- 7 = math channel

Out/Rdg and Out

The scaling of the output. When the reading corresponds to Rdg1, the analog output will be Out1 mA or V. Likewise, when the reading corresponds to Rdg2, the output will be Out2. Between and outside these points, linear interpolation is used.

How to scale a reading 0-100 to 4-20mA output:

- Range = mA
- Rdg1 = 0
- Out1 = 4 (mA)
- Rdg2 = 100
- Out2 = 20 (mA)

Out/Limit

Limiting the analog output between Out1 and Out2. E.g. if Out1=4 and Out2=20, the analog output will not go under 4 mA nor over 20 mA.

However, if the channel that the output follows indicates fault, the output will always exceed the range between Out1...Out2 by 20% (the output will be $Out1 + 1.2 * (Out2 - Out1)$); however it can't go above 22 mA or 11 V.

Monitor menu

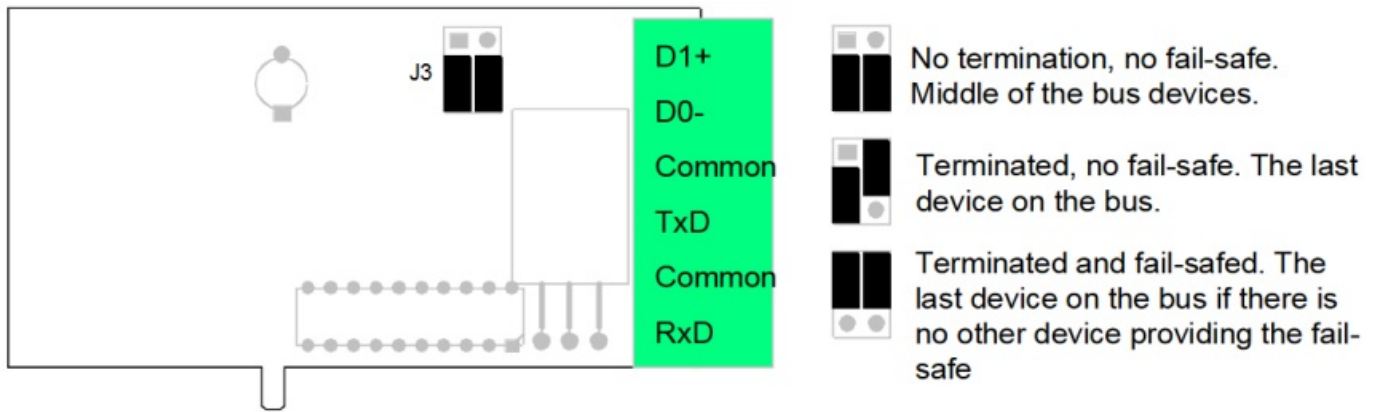
Out

The analog output in mA or V. The analog signal will be electrically limited 0-11 V and 0-22 mA but this value does not obey that limit.

The analog output can be manually steered to test the external systems. Give a Lock command to this item, and enter desired values in mA or V. To return to the normal operation, give a Free command.

Serial card 2000-RS

Jumpers



The serial communications card 2000-RS works most often with the factory set jumpers: no termination. But if the RS-485 bus is long (>50 m), the last device on the bus should be terminated.

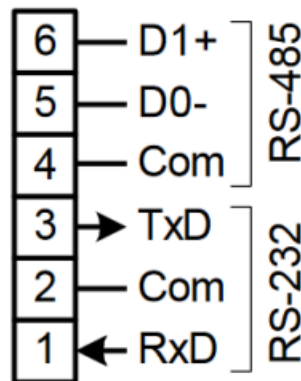
If there is no devices giving the small voltage between the lines when no-one is transmitting, calling fail-safe, this device can be jumpered to do that. Most usually the master of the bus provides the fail-safe voltage.

Connections

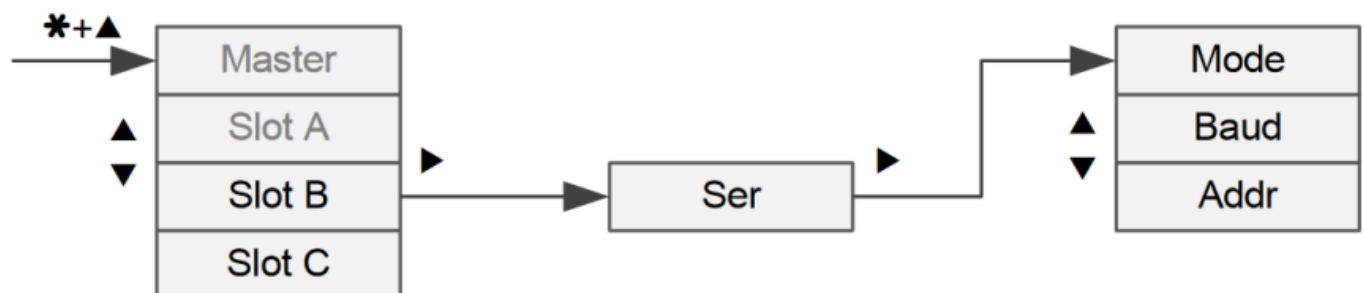
An RS-232 or RS-485 can be connected, but not both.

This card can be installed in slot B or C, but only one card is allowed.

The RS-485 bus consists of two data lines and a common line. In the cable, the data lines should be a twisted pair. The more positive line at idle at terminal 6 is commonly called +, D1, A, or B. Correspondingly the negative line at terminal 5 is called -, D0, B, or A. The common wire is connected in terminal 4. The shield of the cable should be earthed at one point only.



Configuration menu



Mode

Protocol selection. Only SCL is available.

Baud

Baud rate 300, 600, 1200, 2400, 4800, 9600, or 19200 bit/s.

Addr

Serial bus address 0-123. If there are many devices on the same bus, every one must be set to a different address.

In addition to the selected address, this device will always respond in address 126. This is useful if the address of this device is not known – however there must not be other devices on the bus when using this.

Monitor menu**Count**

Will be increased by one every time a valid serial bus command is processed. Will roll over to 0 after 255.

SCL protocol

A more detailed document of the Nokeval SCL protocol is available on Nokeval WWW pages.

This device accepts the following SCL commands:

TYPE ?

Returns the type and firmware version: "2012 V1.5" without the quotation marks.

MEA CH 1 ?

Returns channel 1 reading. The channels are:

- 1 = slot A input
- 2 = slot B input
- 7 = math channel

The response may consist of characters 0...9, minus sign and a decimal point.

If the reading is invalid (e.g. the input signal is below MeaMin), consequent dashes are returned "——". MEA

SCAN 1 3

Returns the readings from channels 1 to 2 separated by a space. E.g. "101.000 0.00000 79800."

MN xxxxx

Configuration commands used by Mekuwin software.

CARDID slot type

Card type programming. Only for factory use. Slot: A=1, B=2, C=3.

Card types: 2012-IN=33, 2000-OUT=16, 2000-RS=17, 2000-REL2=48, 2000-REL3=49.

CARDID slot ?

Card type query.

Relay card 2000-REL2

2000-REL2 is an alarm relay card with 2 relays. The card can be installed in slots B and C or both. If the device is to be equipped with one relay card, it should be installed in slot C.

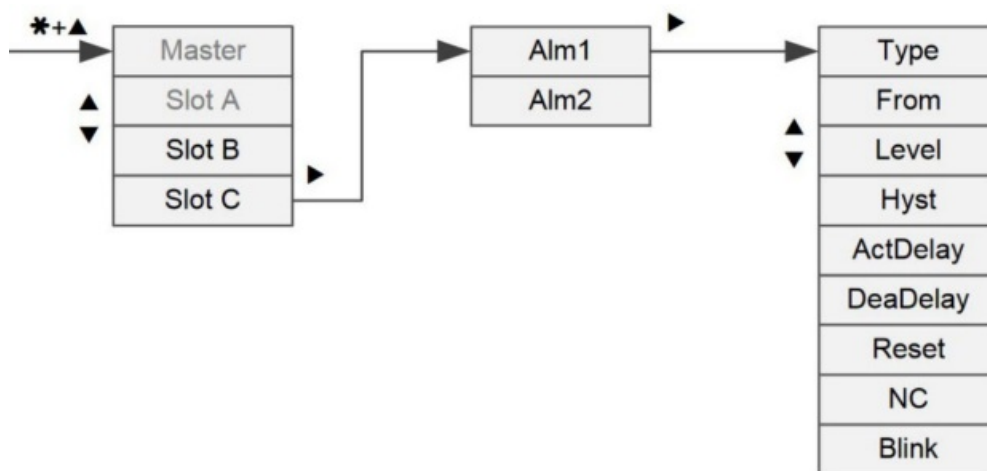
Connections

Two relay card 2000-REL2

The picture shows the relay contacts in the normal or passive state. If the other relay is connected to a safety voltage circuit, the other one must not be used for switching dangerous voltages.



Configuration menu



There are two identical submenus, corresponding to two relays.

• Type

- Off: Alarm disabled.
- Lo: Alarm will activate when the reading goes below Level and deactivate when goes above Level+Hyst.
- Hi: Alarm will activate when the reading goes above Level and deactivate when goes below Level-Hyst.

• From

What channel is this alarm watching. 1=slot A input, 7=math channel.

• Level

Alarm level. See Type.

• Hyst

The difference between alarm activation and deactivation thresholds. Always positive. See Type.

• Delay

Only in firmware V1.0-1.2. Defines the time how long the alarm condition must be true before the alarm will actually activate. This is set in samples – one sample corresponds to 1/15 second. This is used to prevent short disturbances from triggering the alarm.

This applies to the alarm deactivation too, except when the alarm has been programmed to be manually reset.

• ActDelay

Only in firmware 1.3 onwards. Defines the time how long the alarm condition must be continuously true before

the alarm will actually activate. The time is given in seconds, the maximum value being 3495 seconds.

- **DeaDelay**

Only in firmware 1.3 onwards. Like ActDelay, but affects the alarm deactivation. This is used only when Auto is selected in the Reset setting.

- **Reset**

Alarm reset switch selection.

- Auto: No switch – the alarm will deactivate automatically.
- FP: The alarm is reset with the front panel * button.
- ExtSw: The alarm is reset with an external contact connected in slot A.
- Both: The alarm may be reset by both ways.

The alarm cannot be reset before the condition causing the alarm has been removed.

- **NC**

Reverse operation of the relay “normally closed”. If enabled (Yes), the relay coil will normally pull and release at alarm. Does not affect the front panel indicator LEDs.

- **Blink**

If enabled, the display will be blinked at 1 Hz rate when this alarm is active.

Specifications

Enclosure			
Indoors installation	Allowed	Dimensions	See page 3
Outdoors installation	Allowed	Protection	IP65
Altitude	Max 2000 m	Pollution degree	3
Operating temperature	-10...+50 °C	Weight, 4 digits	5 kg
Storage temperature	-30...+50 °C	Weight, 6 digits	6 kg
Humidity	< 90 %Rh		

Power supply			
Nominal voltage	20...28 VAC / VDC or 41...285 VAC depending on model	Pre-fuse (not required)	>2 AT (24V), not required >1 AT (230V), not required
Frequency	45...65 Hz	Installation category	CAT II
Power	<50 VA	Protection	Enclosure: Class 1, protective earth. Inputs: Class 2, reinforced insulation.

Regulations	
Electrical safety EN 61010-1	
Classification	Fixed equipment, permanently connected equipment, with protective earth

Input card 2012-IN	
Galv isolation	From outputs and supply voltage. If two input cards, they share a common ground.
Resolution	Not observable (24 bits)
Sample rate	15 Hz
Overvolt cat	Not allowed to be connected in voltage that is more than 120 VDC or 50 VAC with respect to ground.
mA input	
Resistance	Approx 80 ohm
Range	0...24 mA or wider
Calibr accuracy	$\pm 8 \mu\text{A}$
Non-linearity	$\pm 3 \mu\text{A}$
Thermal drift	$\pm 100 \text{ ppm}/^{\circ}\text{C}$
V input	
Resistance	1.1 Mohm
Range	0...12 V or wider
Calibr accuracy	$\pm 5 \text{ mV}$
Non-linearity	$\pm 2 \text{ mV}$
Thermal drift	$\pm 100 \text{ ppm}/^{\circ}\text{C}$
Potentiometer input	
Excitation	2.5 VDC
Resistance	100 ohm...10 kohm
Thermal drift	$\pm 150 \text{ ppm}/^{\circ}\text{C}$
Transmitter supply	
Supply	24 V $\pm 20\%$ max 150 mA

Analog output 2000-OUT	
Galv isolation	From input and supply voltage, but not from another analog output nor serial bus
mA output	
Range	0...20.8 mA typ
Calibr accuracy	$\pm 8 \mu\text{A}$

Non-linearity	$\pm 4 \mu\text{A}$
Resolution	approx 5 μA (12 bits)
Thermal drift	$\pm 100 \text{ ppm}/^\circ\text{C}$
Max load	12 V (600 ohm)
V output	
Range	0..10.5 V typ
Calibr accuracy	$\pm 5 \text{ mV}$
Resolution	approx 3 mV (12 bits)
Thermal drift	$\pm 100 \text{ ppm}/^\circ\text{C}$
Max load	3 kohm

Serial communications 2000-RS	
Ports	RS-232 or RS-485
Galv isolation	From input and supply voltage but not from analog output
Protocol	Nokeval SCL
Baud rates	300...19200 bit/s
Response time	200 ms max

Alarm relay 2000-REL2	
Relay	2000REL2: 2 pcs
Alarms	1 per relay
Contacts	250 VAC 2 A resistive loadL
Snubber	An external one must be used when driving heavily inductive loads

Nokeval Oy, Yrittäjäkatu 12, 37100 Nokia, Finland,
Tel. +358 3424800, fax. +358 3422066, sales@nokeval.com, www.nokeval.com

Documents / Resources

 <p>FD100A4-2012 and FD100A6-2012 large field displays User Manual</p>	<p>Nokeval FD100A4-2012, FD100A6-2012 Large Field Displays [pdf] User Manual FD100A4-2012 FD100A6-2012 Large Field Displays, FD100A4-2012 FD100A6-2012, Large Field Displays, Field Displays, Displays</p>
---	---

References

- [N Paremman elämän olosuhdevalvontaa | Nokeval](#)
- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

This website is an independent publication and is neither affiliated with nor endorsed by any of the trademark owners. The "Bluetooth®" word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. The "Wi-Fi®" word mark and logos are registered trademarks owned by the Wi-Fi Alliance. Any use of these marks on this website does not imply any affiliation with or endorsement.