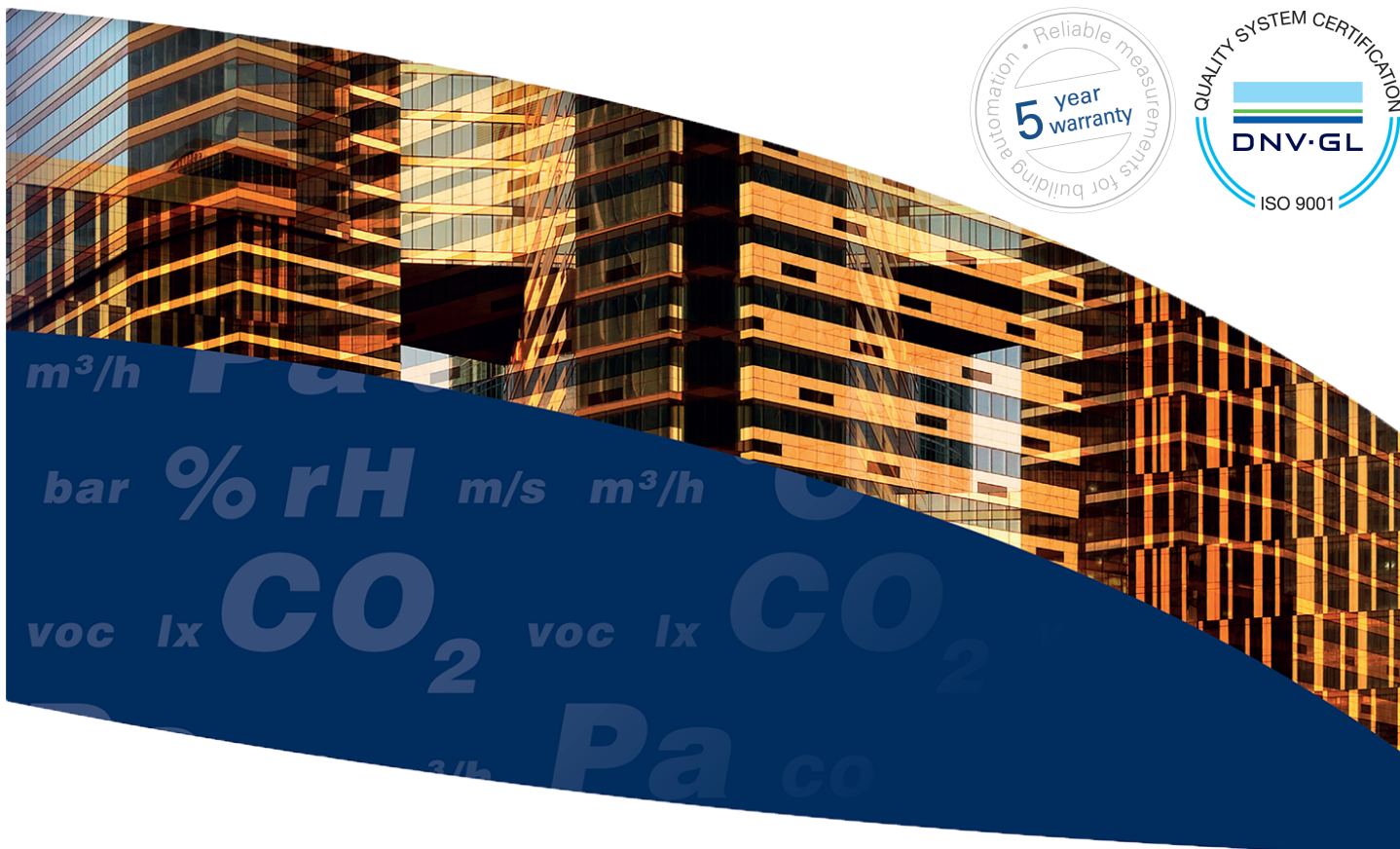




Produal Proxima[®] RU - room unit

User Guide

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1 Commissioning

1.1 Mounting room units

The device can be installed in dry surroundings (IP20) by screws on the wall surface or on the standard flush mounting box. The recommended installation height is 150...180 cm.

The device position should be selected carefully. All the error factors that can affect to the measurements should be eliminated as well as possible. The following list defines the typical measurement error factors.

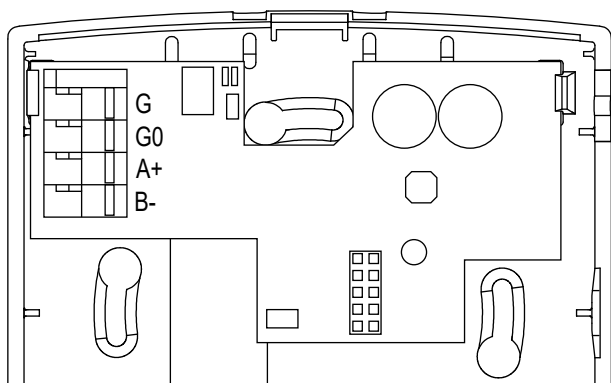
- direct sun light
- occupant proximity
- air flow coming from windows or doors
- air flow coming from ventilation nozzles
- air flow coming from the flush mounting box
- differential temperature caused by external wall

1.2 Wiring



CAUTION: Device wiring and commissioning can only be carried out by qualified professionals. Always make the wirings while the power is switched off.

The terminals are designed for maximum of 1,5 mm² cable area. Please note that the cables for communication (RS-485) should be twisted pair (2x2 pairs). The cable length to the room units should not exceed 10 m.



G	24 Vac/dc, < 1 VA (< 2 VA in CO2 models)
G0	0 V
A+	Modbus RTU (RS-485)
B-	

1.3 Changing the room unit Modbus address

The room unit Modbus address is 1 as the factory setting. The address can be changed via Modbus or by changing the address by turning the knob within 10 seconds after the room unit power is turned on. Only addresses 1 and 2 are available when changing the address by turning the knob.

1. Turn on the room unit power.

All indicator lights are illuminated for 2 seconds to indicate that the lights are working.

After the 2 seconds, the current address is shown by flashing the left-most indicator lights. The address is the same as the number of flashing indicator lights.

2. Turn the knob anytime within the 10 second time frame to change the address.

Address 1: Turn the knob three steps counter-clockwise and then three steps clockwise.

Address 2: Turn the knob three steps clockwise and then three steps counter-clockwise.

When the address is changed successfully, the indicator lights start to flash to show the current address.

2 Maintenance

2.1 CO₂ measurement calibration

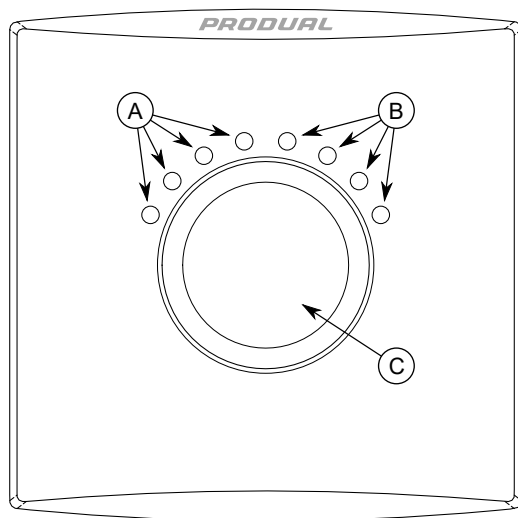
The device uses automatic CO₂ measurement calibration function (ABC algorithm). The function eliminates the possible long term drift. The automatic calibration function can be used when the CO₂ concentration drops at least two times within a week to the level of approximately 400 ppm. Therefore the automatic calibration is effective in spaces that are not continuously occupied.

The automatic calibration function can be deactivated in continuously occupied spaces by using ML-SER tool.

If the automatic calibration function is not in use, the device should be calibrated every 6-12 months. The recommended calibration interval is 5 years even if the automatic calibration is in use.

3 User interface

3.1 Set point knob

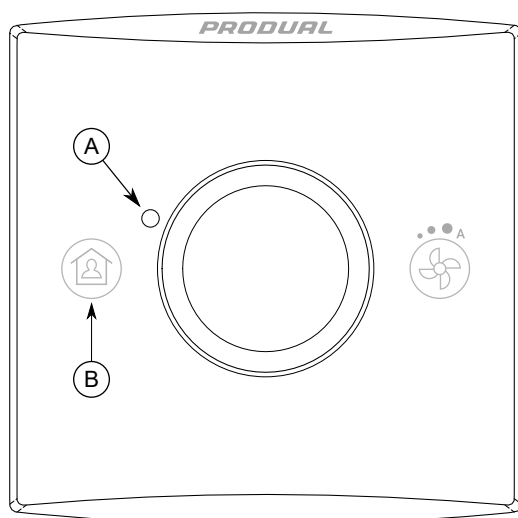


- A. Blue indicator lights
- B. Orange indicator lights
- C. Set point knob

With the set point knob you can set the temperature set point for controller.

The indicator lights indicate how far the user set point is from the set point center (Modbus register 40002). When the user set point is same as the set point center value, one blue indicator light and one orange indicator light are illuminated. When the set point knob is turned away from the set point center, the corresponding lights are illuminated. When all blue or orange lights are illuminated the user set point has reached the user set point range limit (Modbus register 40003). All indicator lights have three states (off, dimmed, bright).

3.2 Man in house button

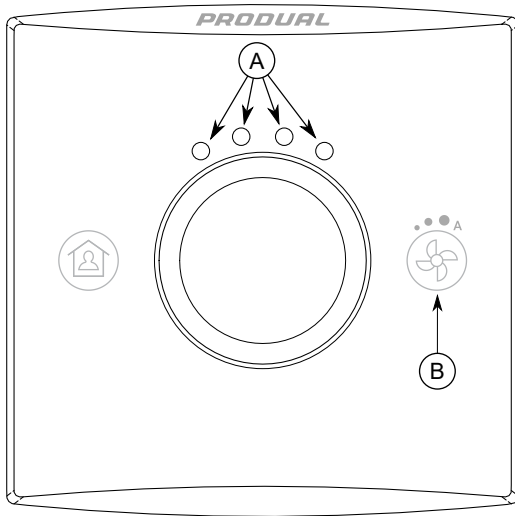


- A. Indicator light for man in house button
- B. Man in house button

When the man in house button is pressed, the Modbus register 40020 changes to 1. The button press is indicated with the blue indicator light.

For example, the man in house button can be used to temporarily move the controller to day mode or indicate occupancy.

3.3 Fan button

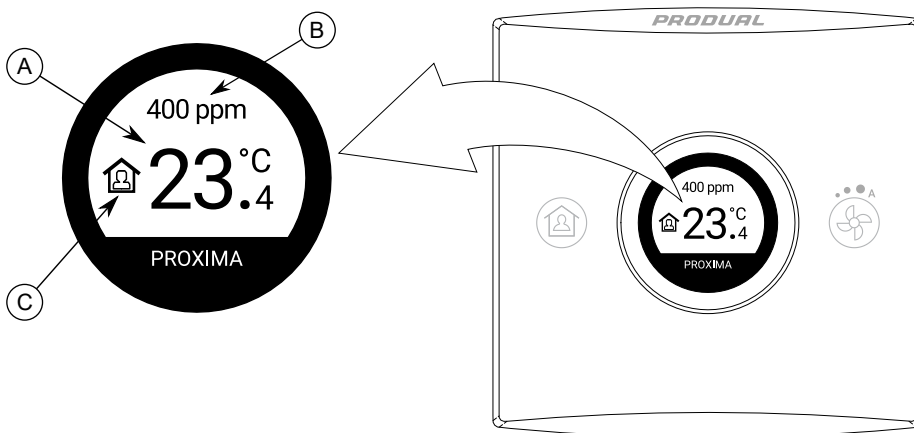


- A. Indicator lights for fan
- B. Fan button

By pressing the fan button you can set the fan speed. The fan speed is indicated with green indicator lights.

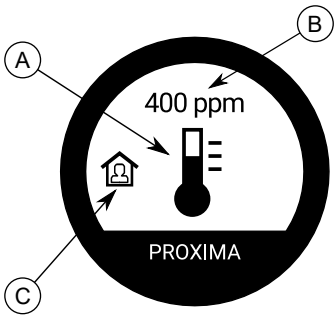
Fan speed	Number of illuminated indicator lights
Fan off	0
Speed 1	1
Speed 2	2
Speed 3	3
Automatic	4

3.4 Display



- A. Main information view
- B. Secondary information view
- C. Function symbol

If the set point view is enabled (register 40026), the view is displayed as follows.



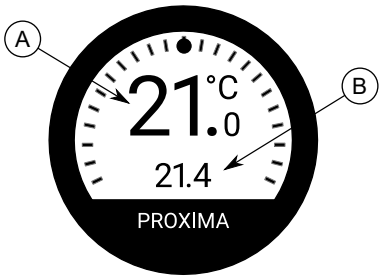
- A. Set point view symbol
- B. Secondary information view
- C. Function symbol

The available views are listed in the following table.

Main information view	23.4°C	Measured temperature.
		Set point view symbol.
Secondary information view	≈ 21.0	Set point. The arrows can be used to indicate the cooling or heating need. The arrows are controlled via Modbus registers 40033 (cooling) and 40034 (heating).
	≈ +1.0	Deviation from the set point. The arrows can be used to indicate the cooling or heating need. The arrows are controlled via Modbus registers 40033 (cooling) and 40034 (heating).
	400 ppm	CO ₂ value.
	34 %RH	Humidity value.
Function symbol		The area is empty when the day mode is active.
		Man in house symbol. The symbol is visible when the temporary day mode is active.
		Night mode symbol. The symbol is visible when the night mode is active.
		Eco mode symbol. The symbol is visible when the eco mode is active.

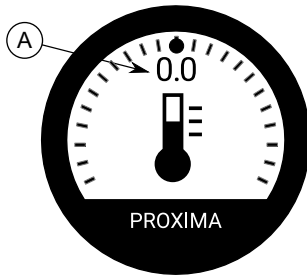
3.4.1 Set point adjustment view

When the set point knob is turned, the set point adjustment view is displayed.



- A. Set point
- B. Measured temperature

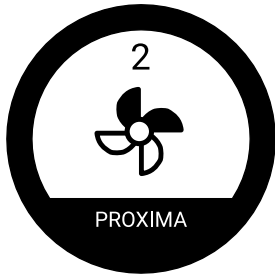
If the set point view is enabled (register 40026), the view is displayed as follows.



A. Deviation from set point

3.4.2 Fan speed view

When the fan button is pressed, the fan speed view is displayed.



The first press displays the current fan speed and the second press changes the speed.

4 Modbus

4.1 Modbus properties

Protocol	RS-485 Modbus RTU
Bus speed	9600*/14400/19200/38400/57600/115200 bit/s
Data bits	8
Parity	none*/odd/even
Stop bits	1* / 2
Network size	up to 127 devices per segment
	* factory setting

4.2 Modbus function codes

The device supports the following Modbus function codes.

0x01	Read Coils
0x02	Read Discrete Inputs
0x03	Read Holding Registers
0x04	Read Input Registers
0x05	Write Single Coil
0x06	Write Single Register
0x0F	Write Multiple Coils
0x10	Write Multiple Registers
0x17	Read/Write Multiple Registers

4.3 Modbus registers

4.3.1 Input registers

4.3.1.1 Input registers for device status

Register	Parameter description	Data type	Values	Range
30001	Measured temperature value.	Signed 16	0...600	0,0...60,0 °C
30002	Set point.	Signed 16	20...420	2,0...42,0 °C
30003	User fan speed.	Signed 16	0 - 1 - 2 - 3 - 4	0. Off 1. Speed 1 2. Speed 2 3. Speed 3 4. Automatic
30004	Current operation mode.	Signed 16	0 - 1 - 2 - 3	0. Off 1. Day 2. Night 3. Eco
30005	Measured CO ₂ value	Signed 16	0...2000	0...2000 ppm
30006	Measured humidity value.	Signed 16	0...1000	0...100,0 %rH

Register	Parameter description	Data type	Values	Range
30007	Remaining time in the PIR or man in house off delay.	Signed 16	0...600	0...600 min
30008	PIR detection status. The register value is reset to 0 after reading.	Signed 16	0 - 1	0. Movement not detected 1. Movement detected
30009	Man in house button status.	Signed 16	0 - 1	0. Inactive 1. Delay is active
30010	Measured humidity value.	Signed 16	0...10000	0...100,00 %rH
30011	Fan status (manual /automatic).	Signed 16	0 - 1	0. Manual mode 1. Automatic mode

4.3.1.2 Input registers for device information

Register	Parameter description	Data type	Values	Range
39918	Primary software ID1.	Unsigned 16	0...65535	0...65535
39919	Primary software ID2.	Unsigned 16	0...65535	0...65535
39920	Primary software version 1.	Unsigned 16	0...65535	0...65535
39921	Primary software version 2.	Unsigned 16	0...65535	0...65535

4.3.2 Holding registers

4.3.2.1 Holding registers for device settings

Register	Parameter description	Data type	Values	Range	Default
40001	Set point from Modbus. The value overdrives the user set value when writing.	Unsigned 16	20...420	2,0...42,0 °C	210
40002	Set point centre.	Unsigned 16	18...26	18...26 °C	21
40003	Set point range.	Unsigned 16	0...16	0...16 °C	2
40004	Set point deviation step.	Unsigned 16	1...5	0,1...0,5 °C	5
40005	User fan speed overdrive. The value overrides the user set value when writing.	Unsigned 16	0 - 1 - 2 - 3 - 4	0. Off 1. Speed 1 2. Speed 2 3. Speed 3 4. Automatic	4
40006	Current fan speed.	Unsigned 16	0 - 1 - 2 - 3	0. Off 1. Speed 1 2. Speed 2 3. Speed 3	0
40007	Current operation mode. The value overrides the user set value when writing.	Unsigned 16	0 - 1 - 2 - 3	0. Off 1. Day 2. Night 3. Eco	0
40008	External temperature measurement value.	Unsigned 16	0...500	0,0...50,0 °C	230
40009	External CO ₂ measurement value.	Unsigned 16	0...2000	0...2000 ppm	400

Register	Parameter description	Data type	Values	Range	Default
40010	Screen saver delay.	Unsigned 16	0 - 1 - 2 - 3 - 4 - 5 - 6	0. 15 s 1. 30 s 2. 1 min 3. 2 min 4. 5 min 5. 10 min 6. 30 min	0
40011	Screen brightness when screen saver is active.	Unsigned 16	0...100	0...100 %	10
40012	Screen brightness.	Unsigned 16	0...100	0...100 %	70
40013	Occupancy timer. Timer can be activated by man in house button or PIR detection.	Unsigned 16	0 - 1 - 2 - 3 - 4 - 5 - 6	0. 5 min 1. 15 min 2. 30 min 3. 60 min 4. 90 min 5. 120 min 6. Off / filtering	1
40014	Temperature measurement offset.	Unsigned 16	-30...30	-3,0...3,0 °C	0
40015	CO ₂ measurement offset.	Unsigned 16	-100...100	-100...100 ppm	0
40016	Temperature display offset.	Unsigned 16	-30...30	-3,0...3,0 °C	0
40017	CO ₂ display offset.	Unsigned 16	-100...100	-100...100 ppm	0
40018	Timer value.	Unsigned 16	0...65535	0...65535 min	0
40019	PIR detection status. The register is reset after successful reading operation.	Unsigned 16	0 - 1	0. No detection 1. Detection	0
40020	Man in house button status. The register is reset after successful reading operation.	Unsigned 16	0 - 1	0. Button not pressed 1. Button pressed	0
40021	External temperature shown on display. If the measured value is not available or the register 40008 value is 0, the field on the display is left empty.	Unsigned 16	0 - 1	0. Measured value is shown. 1. Value from the register 40008 is shown.	0
40022	External CO ₂ shown on display. If the measured value is not available or the register 40009 value is 0, the field on the display is left empty.	Unsigned 16	0 - 1	0. Measured value is shown. 1. Value from the register 40009 is shown.	0
40023	Fan button visibility.	Unsigned 16	0 - 1	0. Not visible 1. Visible	1
40024	Man in house button visibility.	Unsigned 16	0 - 1	0. Not visible 1. Visible	1
40025	CO ₂ / humidity value visibility	Unsigned 16	0 - 1 - 2 - 3	0. Not visible 1. Humidity and CO ₂ 2. Humidity 3. CO ₂	1
40026	Show set point on display.	Unsigned 16	0 - 1	0. Measured temperature 1. Set point	0

Register	Parameter description	Data type	Values	Range	Default
40027	Temperature unit.	Unsigned 16	0 - 1	0. Celsius 1. Fahrenheit	0
40028	Fan type.	Unsigned 16	0 - 1	0. EC fan 1. 3-speed fan	0
40029	Man in house button function.	Unsigned 16	0 - 1	0. Delay 1. On/off	0
40030	Man in house button status and timer override.	Unsigned 16	0 - 1	0. Off 1. On	0
40031	Automatic day mode after PIR detection, man in house button press or timer end.	Unsigned 16	0 - 1	0. Off 1. On	1
40032	Night / save mode. The selected mode activates when the timer ends.	Unsigned 16	0 - 1	0. Night 1. Save	0
40033	Cooling symbol visibility.	Unsigned 16	0 - 1	0. Not visible 1. Visible	0
40034	Heating symbol visibility.	Unsigned 16	0 - 1	0. Not visible 1. Visible	0
40035	BMS slave address (RS-485).	Unsigned 16	0...255	0...255	1
40036	BMS bus speed (RS-485).	Unsigned 16	0 - 1 - 2 - 3 - 4 - 5	0. 9600 bps 1. 14400 bps 2. 19200 bps 3. 38400 bps 4. 57600 bps 5. 115200 bps	0
40037	BMS bus parity (RS-485).	Unsigned 16	0 - 1 - 2	0. None 1. Odd 2. Even	0
40038	BMS bus stop bits (RS-485).	Unsigned 16	0 - 1	0. 1 stop bit 1. 2 stop bits	0
40039	RS-485 mode.	Unsigned 16	0 - 1	0. Disabled 1. Modbus	1
40040	Fan button mode.	Unsigned 16	1 - 2	1. 0 - 1 - 2 - 3 - Auto 2. 0 - toggle speed - Auto	1
40041	Fan toggle speed.	Unsigned 16	1 - 2 - 3	1. Speed 1 2. Speed 2 3. Speed 3	1
40042	Automatic calibration function (ABC algorithm) status.	Unsigned 16	0 - 1	0. ABC off 1. ABC on	1
40043	Humidity measurement offset.	Unsigned 16	-500...500	-50,0...50,0 %rH	0
40044	Humidity display offset.	Unsigned 16	-500...500	-50,0...50,0 %rH	0

4.3.2.2 Holding registers for device naming

Register	Parameter description	Data type	Values	Range	Default
49901	Characters 1 and 2 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	21870
49902	Characters 3 and 4 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	28257
49903	Characters 5 and 6 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	28005
49904	Characters 7 and 8 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	25632
49905	Characters 9 and 10 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	25701
49906	Characters 11 and 12 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	30313
49907	Characters 13 and 14 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	25445
49908	Characters 15 and 16 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49909	Characters 17 and 18 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49910	Characters 19 and 20 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49911	Characters 21 and 22 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49912	Characters 23 and 24 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49913	Characters 25 and 26 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49914	Characters 27 and 28 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49915	Characters 29 and 30 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0
49916	Characters 31 and 32 of the device name.	Unsigned 16	0...65535	[0...255], [0...255]	0

