



RLE Technologies

SEAHAWK LDZ4

User Guide



SeaHawk



LDZ4

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CHAPTER 1: PRODUCT OVERVIEW

1-1 DESCRIPTION

The LDZ4 is a complete monitoring system that detects and reports the presence of water and other conductive liquids. The LDZ4 couples RLE's water leak detection cable with an advanced control head to monitor four individual zones. When a conductive liquid comes in contact with the sensing cable, an alarm sounds and the leak and summary alarm relays activate. The LED that corresponds with the appropriate zone also illuminates.

The LDZ4 is a supervised system - it continuously monitors the cable for leaks and cable integrity. A cable break causes a cable fault indication. An alarm sounds and the appropriate cable fault relay and the summary alarm relay activate. The appropriate cable fault LED is also activated.



NOTE:

The LDZ4 produces an alarm in the following conditions:

- **Leak Detected**
- **Cable Fault**

1-2 LDZ4 FRONT PANEL INDICATORS

1-2.1 Leak Detected LEDs

One red LED for each zone. Flashes quickly if a leak is detected in the zone. Flashes slowly if the leak goes away before the system is reset. On solid once the alarm is acknowledged - the Quiet button is pushed.

1-2.2 Cable Fault LEDs

One yellow LED for each zone. Flashes quickly if a cable fault is detected in the zone. Flashes slowly once the fault clears. On solid once the alarm is acknowledged - the Quiet button is pushed.

1-2.3 Power LED

On (green) as long as power is on.

1-2.4 Audible Alarm

Activates when a leak or cable fault is detected. Silenced with the Quiet switch.

Reset Switch - Used to reset all alarms. If any alarms still exist after they are reset, the LEDs will turn on, the audible alarm will sound, and the relays will activate.

1-2.5 Quiet Switch

The audible alarm is silenced, and any LED(s) in alarm will glow solidly. If the alarm goes away, the LED(s) will flash slowly.

1-2.6 Test Switch

Lights each zone's LEDs in sequence. The audible alarm will sound. If the switch is held for the entire test sequence, the LEDs will glow solidly and all three relays will activate until the switch is released. The test sequence will also cycle when the unit is powered on.



Figure 1-1: LDZ4 Front Panel Indicators

CHAPTER 2: CONNECTIONS & SETTINGS

2-1 LEAK DETECTION BOARD

The LDZ4's connectors, found at the bottom of the following photograph, are labeled TB4 through TB7. The switches on the board are labeled SW1 and SW2. The unit has four dials that are used to adjust the sensitivity for each zone. They are labeled R2 through R5.

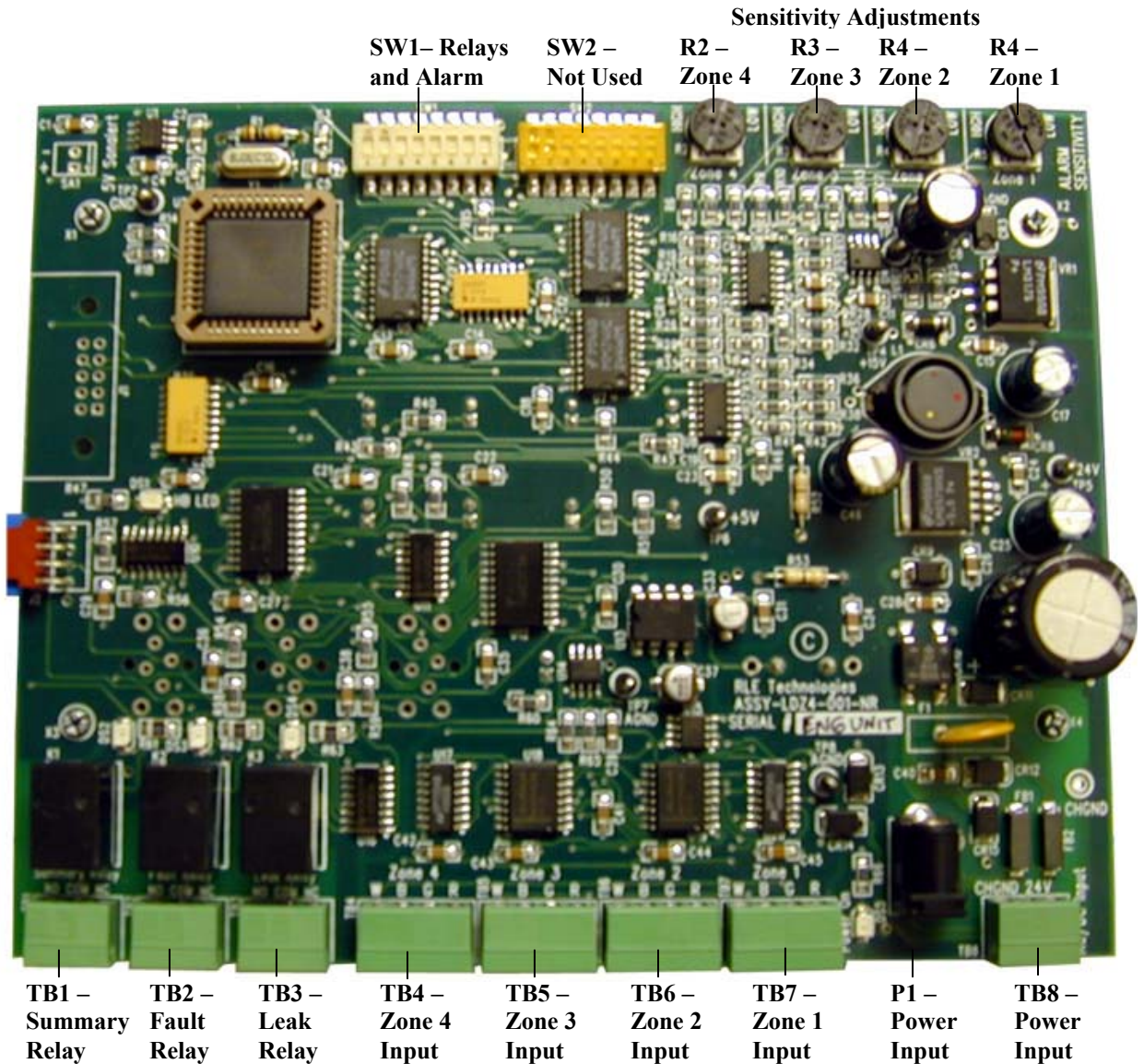


Figure 2-1: LDZ4 Leak Detection Board

2-1.1 TB8 – Power

The LDZ4 connects to a 24VAC/24VDC power supply using TB8, a three position connector labeled 24V.

2-1.2 P1 - Power

Power can also be supplied to the unit through P1. This is a wall adapter plug connection.

2-1.3 TB3 - Leak Relay

This is the Leak Relay output terminal block (Form C). A status LED is located above the relay, which will indicate the state of the relay (on/off). This relay can be configured as supervised or unsupervised, latched or unlatched. Connect the Leak Relay wires to TB3 as follows:

- TB3-1 Leak alarm normally open (NO)
- TB3-2 Leak alarm common (C)
- TB3-3 Leak alarm normally closed (NC)

2-1.4 TB2 - Cable Fault Relay

This is the Cable Fault Relay output terminal block (Form C). A status LED is located above the relay, which will indicate the state of the relay (on/off). This relay can be configured as supervised or unsupervised, latched or unlatched. Connect the Leak Relay wires to TB2 as follows:

- TB2-1 Cable fault alarm normally open (NO)
- TB2-2 Cable fault alarm common (C)
- TB2-3 Cable fault alarm normally closed (NC)

2-1.5 TB1 - Summary Relay

This is the Summary Relay output terminal block (Form C). A status LED is located above the relay, which will indicate the state of the relay (on/off). This relay can be configured as supervised or unsupervised, latched or unlatched. Connect the Leak Relay wires to TB1 as follows:

- TB1-1 Summary alarm normally open (NO)
- TB1-2 Summary alarm common (C)
- TB1-3 Summary alarm normally closed (NC)

2-1.6 TB7 through TB4 - Zone 1 through Zone 4 Leak Detection Cable Inputs.

Leak detection cables connect to TB7-TB4 (zones 1-4). A fifteen foot leader cable is provided to connect the LDZ4 to the Leak Detection Cable(s). Connect the leader cable wires as follows:

- (x=7....4)
- TBx-1 White wire
 - TBx-2 Black wire
 - TBx-3 Green wire
 - TBx-4 Red wire

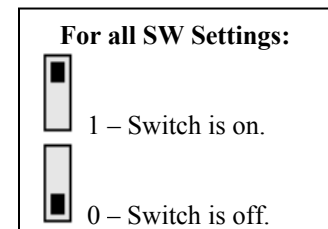
2-2 SW1 - RELAYS AND ALARM**2-2.1 SW1, Position 1**

Configures the relays as supervised or non-supervised. If a relay is supervised, the relay picks until power goes off or until an alarm is detected. The alarm then releases to announce a change in state. A non-supervised relay releases only when an alarm is detected.

- 1 = Supervised
- 0 = Non-supervised (factory default)

2-2.2 SW1, Position 2

Configures the relays as latched or non-latched. If a relay is latched, the relay will remain in an alarm condition until the Reset switch is pressed. If a relay is non-latched, the relay will remain in alarm until either the Reset switch is pressed, or the



condition that tripped the relay goes away.

- 1 = Latched
- 0 = Non-latched (factory default)

2-2.3 SW1, Position 3

Configures the audible alarm as latched or non-latched. If an alarm is latched, the audible alarm will sound until the Quiet switch is pressed. If an alarm is non-latched, the audible alarm will sound until either the Quiet switch is pressed, or the alarm goes away - which ever occurs first.

- 1 = Latched
- 0 = Non-latched (factory default)

2-2.4 SW1, Position 4

Configures the summary alarm relay.

- 1 = Summary Relay is silenceable.
Relay is on when fault/leak alarm is present or until the Quiet pushbutton is pressed.
- 0 = Summary Relay is on whenever Fault/Leak relays are on.

2-2.5 SW1, Positions 5 through 8

Designates the unit's realarm time. Arrange the switches to achieve the desired realarm time:
(*Note: these are approximate times.*)

- 8765 = Switch position
- 0000 = Disabled (factory default)
- 0001 = One minute
- 0010 = Five minutes
- 0011 = 10 minutes
- 0100 = 15 minutes
- 0101 = 30 minutes
- 0110 = One hour
- 0111 = Two hours
- 1000 = Three hours
- 1001 = Four hours
- 1010 = Six hours
- 1011 = Eight hours
- 1100 = 10 hours
- 1101 = 12 hours
- 1110 = 18 hours
- 1111 = 24 hours

2-3 SW2 - NOT USED - FUTURE USE ONLY

2-4 R2 THROUGH R5 - SENSITIVITY SETTINGS

These potentiometers allow users to adjust the sensitivity settings for each zone. Turn the dial clockwise to make the zone less sensitive. This means a leak will be reported in that zone when a large amount of water is present. Turn the dial counterclockwise to make the zone more sensitive. This means a leak will be reported for the zone when a small amount of water is present.

CHAPTER 3: INSTALLATION

3-1 BEFORE YOU BEGIN

The LDZ4 is a wall mounted device. To secure the device to the wall, first open the door of the enclosure. There are knockouts on the top and bottom of the enclosure. Remove as many as necessary. Use drywall anchors and the holes in the back of the enclosure to secure the unit to the wall. Remember to close the door and secure the latch when installation is complete.

3-2 CONNECTING THE WATER LEAK DETECTION CABLE

The LDZ4 is packaged with four 15 foot lengths of leader cable. One end of this leader cable connects into the LDZ4. This end of the cable is finished with a terminal connector. The other end features a mating connector which connects with the water leak detection cable. The end of the cable zone is finished with a removable end terminator.

To connect the leader cable to the LDZ4, connect the wires (4) to the 4 position terminal connector, then plug the terminal connector into the appropriate terminal block. From left to right, with the screws of the connector facing up, the wires that screw into the terminal connector should be colored white, black, green, and red. If the terminal connector is removed from the end of the cable, make sure the wires are in this same order when the connector is reapplied. Terminal block and zone correlation information is found in section 1.2 of this user guide.

Once the leader cable is plugged into the terminal blocks, it is ready to be connected to the water leak detection cable. To do this, unscrew the end terminator from the end of the leader cable. Attach the first length of sensing cable to the leader cable. Route the sensing cable according to the cable layout diagram, if provided. Lay the cable according to the following guidelines. Secure the end terminator on the unoccupied end of the water leak detection cable.

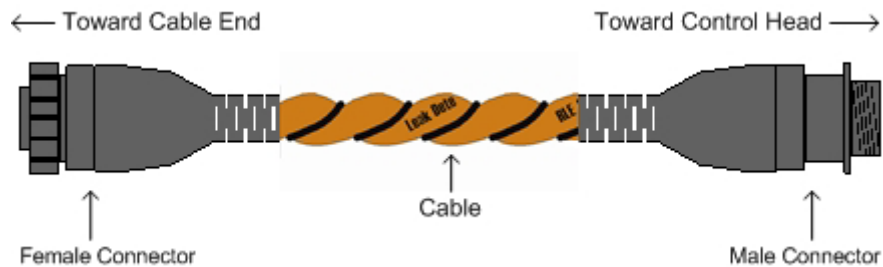


Figure 3-1: Water Leak Detection Cable

3-2.1 Secure the Cable to the Floor

Secure the cable to the floor with either J-clips or one of the other approved methods shown in Figure 3-2. J-clips are the manufacturer's recommended installation method.

- Place one J-clip every three feet along the length of the sensing cable. Place one J-clip at each turn of the cable.
- If the cable is installed over an obstruction, clip the cable on both sides, as close to the obstruction as possible.
- Do not install the cable directly in front of an air conditioner. Allow a minimum of six feet between the unit and the cable. If the cable is too close to the air conditioning unit's air stream, the

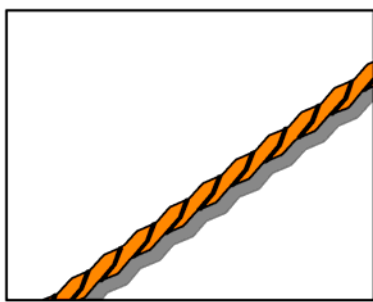
moisture from the humidifier may cause false leak readings. If the cable must be installed in front of an air conditioning unit, place the J-clips 12 to 18 inches apart.



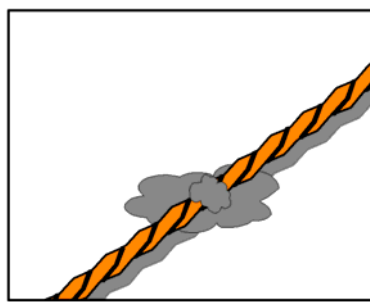
NOTE:

It is important to finish the end of the water leak detection cable with the end-of-line terminator. If the terminator is not present, a cable fault will register. Note any variances between the cable layout diagram and the actual cable installation. Wait approximately one minute. No alarm should be present.

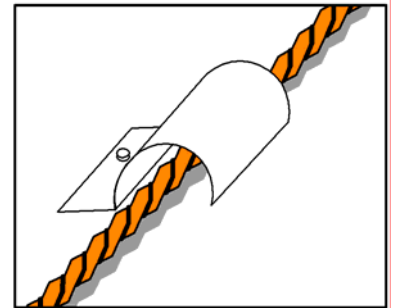
3-2.2 Recommended Cable Installation



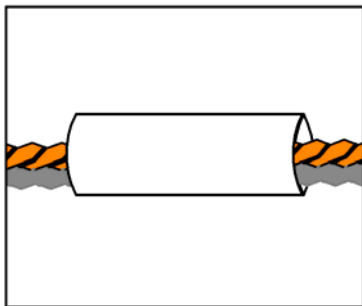
Laid freely on the floor.
Only recommended in spaces with no access.



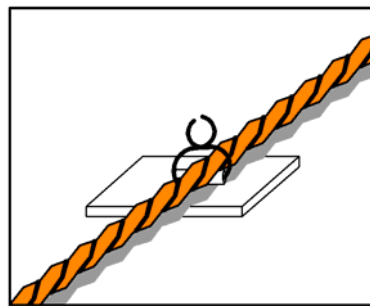
Secured to floor with mastic.



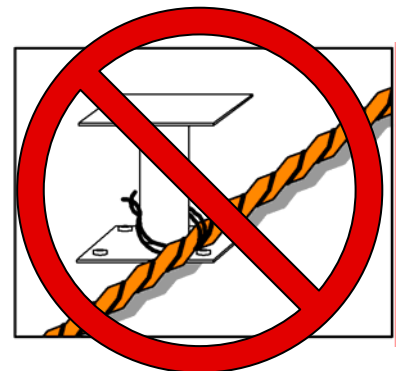
Installed in protective covering.



Secured to floor with J-clips.



Secured to floor with tie wrap.



Secured to pedestal with tie wrap.
Do Not Secure as Shown

Figure 3-2: Cable Installation Methods

3-3 APPLY POWER TO THE UNIT

Once cable for all the leak detection zones has been connected to the unit, power may be applied. The LDZ4 operates on 24VAC/VDC power, supplied by a wall adapter or a direct line. A power supply should be run to the location of the unit. Before applying power to the unit, make sure the 24VAC/VDC power supply is turned off. The LDZ4 may be Earth grounded. Either ground the unit through conduit, or run an Earth ground wire to the left opening on TB8.

3-3.1 Power via Wall Adapter

The LDZ4 can be powered by a wall adapter. Before connecting the wall adapter to the LDZ4, unplug the adapter from the wall. If the adapter has a connector on the end, feed the cord through one of the knockouts in the enclosure and plug it directly into the 24VAC/VDC receptacle located at P1. Plug the other end of the adapter into the wall. The LDZ4 should power up immediately.

If the adapter does not have a connector on the end, strip the end of the adapter line so the two wires inside are exposed. Strip the end of each of the two wires and feed them into the enclosure. Insert the two wires into the terminal block labeled TB8. The minus, or ground, wire is placed into the center opening in the terminal block. The plus, or live, wire is placed into the right opening in the terminal block. The left opening of the terminal block will be empty. A separate Earth ground line can be placed in this opening.

Once all the wires have been placed inside the terminal block, tighten the three screws across the bottom of the terminal block until the wires are securely held in place. Plug the other end of the wall adapter into the wall. The LDZ4 should power up immediately.

3-3.2 Power via Direct Line

Once the power is turned off, strip the end of the 24VAC/VDC supply so the three wires inside are exposed. Strip the end of each of the three wires and feed the end of the power supply into the LDZ4 enclosure. The three wires must now be inserted into the terminal block in the lower right corner of the enclosure. As is labeled in the enclosure, the Earth ground line is placed into the left hand opening of the terminal block. The minus, or ground, line is placed into the opening in the center of the terminal block. The plus, or live, power line is placed inside the right hand opening of the terminal block.

Once all the wires have been placed inside the terminal block, tighten the three screws across the bottom of the terminal block until the wires are securely held in place. Turn the 24VAC/VDC supply back on. The LDZ4 should power up immediately.

APPENDIX A: TROUBLESHOOTING

Trouble	Action
<p>No Power <i>Power On LED is Not On</i></p>	<p>Check Power Supply Check for supply power at TB8 pins 2 and 3 on the bottom right hand corner of PCB.</p> <ol style="list-style-type: none"> 1) If power is not present at TB8 pins 2 and 3, check AC input voltage to wall adapter, if used. 2) If power is not present at TB8 pins 2 and 3, check DC voltage at DC supply source distribution panel. 3) If voltage (power) is present at TB8, please contact RLE Technologies.
<p>Cable Fault on Zone(s)</p>	<p>Check for Proper Wiring to Terminal Blocks TB4, TB5, TB6 and TB7 Wiring order should be as follows from left to right: <i>White, Black, Green and Red.</i></p> <ol style="list-style-type: none"> 1) If wiring order is correct, disconnect the End-of-Line terminator from the end of the orange sense cable. Then connect the End-of-Line terminator to the end of the leader cable (non-sensing). Push reset once connected to reset control head. 2) If the cable fault condition goes away, there is a faulty or damaged section of orange cable (sense). 3) If the fault condition does not clear, remove the respective zone terminal block and remove the input wires from the leader cable. Install a jumper wire between pins 1 and 2, and another jumper wire between pins 3 and 4. 4) If condition still exists, please contact RLE Technologies for extra support. If the condition clears, the leader cable is faulty (open wire(s)).
<p>Leak Detected on Zone(s)</p>	<p>Be sure there is No Water Present on or around the Zone in Alarm</p> <ol style="list-style-type: none"> 1) If water is present, dry affected area and reset the controller. If the condition does not clear follow the step below. 2) Remove the end-of-line terminator from the end of the orange sense cable and install it onto the end of the leader cable. If the condition clears, there is a water leak or damage to the sense cable. Start moving the End-of-Line terminator to the end of each cable section until the water-detected fault reoccurs. If the condition is still present once the End-of-Line terminator has been placed on the end of the leader cable, follow the step below. 3) Disconnect the proper terminal block from the zone in alarm. Place a jumper wire between pins 1 and 2, and place a jumper wire between pins 3 and 4. Plug the terminal block back into the proper socket and push reset on the control head. If the condition is corrected, there is a problem with the leader cable. If the water leak condition is still present, contact RLE Technologies for support.

APPENDIX B: FCC CLASS B CLASSIFICATION

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference.
- 2) This device must accept any interference received, including interference that may cause undesired operation. Shielded cable must be used with this unit to ensure compliance with the Class B FCC limits.

Warning!

Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

NOTE:

This Class B digital apparatus complies with the Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

APPENDIX C: TECHNICAL SPECIFICATIONS

Power	24VAC/VDC ($\pm 10\%$) @ 300mA max.
Inputs	
Water Leak Detection Cable	Supplied with 15' (4.57m) leader cable per zone
Maximum Length	1000' (305m)/zone
Detection Response Time	<20sec
Outputs	
Relay	1 Form C Leak Relay, 1 Form C Cable Fault Relay, 1 Form C Summary Alarm Relay (silenceable); 1A @ 24VDC, 0.5A resistive @ 120VAC; configurable for supervised or non-supervised, latched or non-latched
Alarm Notification	
Audible Alarm	85DBA @ 2' (0.6m), re-sound 0-24hrs
Front Panel Interface	
LED Indicators	1 green Power (on/off); 4 amber Cable Fault; 4 red Leak Detected (1 per zone)
Push Buttons	1 Reset, 1 Quiet & 1 Test
Operating Environment	
Temperature	32° to 122°F (0° to 50°C)
Humidity	5% to 95% RH, non-condensing
Altitude	10,000' (3,048m) max.
Storage Environment	-4° to 158°F (-20° to 70°C)
Dimensions	10.5"W x 8.0"H x 2.0"D (267mmW x 203mmH x 51mmD)
Weight	4 lbs. (1.82kg)
Mounting	Vertical wall mount
Certifications	UL508A/CUL508A, FCC Part 15



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