AI-Tango Technical User Guide

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Product Name: AI-Tango

AI-Tango Technical User Guide

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Revision history

Date	Revision	Version	Comments
5/25/2023	A	0	Initial baseline version.
5/30/2023	A	1	Added a note to the "green flashing" description in "Status indicator lights" clarifying that the AI-Tango can receive from any address.
6/6/2023	A	2	Added a safety warning to "Dimensions" and added "Warranty information."
10/29/2024	B	0	Fixed incorrect switch in "Analog In" figure and added potentiometer description, diagram, and warning to "Analog input for resistance." In "Analog inputs," changed 250 kΩ to 1 kΩ in "Analog input circuitry" diagram.

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1.0 ASTi Interface-Tango (AI-Tango)

The AI-Tango is a compact I/O distribution device that connects local or remote control panels and other peripherals to the network via Ethernet. The ASTi server or another host transmits I/O data to the AI-Tango over a local area network (LAN). Depending on the user's or program's needs, the AI-Tango can connect to simulated radio panels and press-to-talk (PTT) devices.

Figure 1, "AI-Tango hardware diagram" below shows an example of an AI-Tango network configuration:

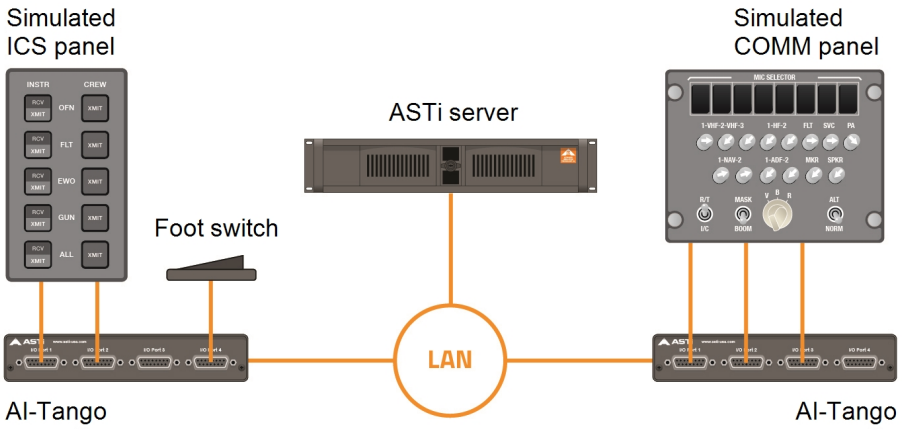

Figure 1: AI-Tango hardware diagram

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2.0 Specifications

The AI-Tango includes the following weight, power, and Ethernet specifications:

Weight	1 lb, 11 oz.
Power Source	Ethernet port via Power over Ethernet (PoE) IEEE 802.3af, Class 0
Power Consumption	<12.5 W at 56 VDC
Mean Time Between Failure (MTBF)	1,471,064.17 hours (COTS) 387,948.76 hours (MIL)
Ethernet Port Speed/Duplex	100 BASE-TX/1000 BASE-T, full duplex; RJ-45 port; CAT5e or better cabling requirement

Table 1: AI-Tango specifications

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3.0 Front and rear panels

The front panel features four DB-15 connectors that are compatible with a variety of I/O devices:

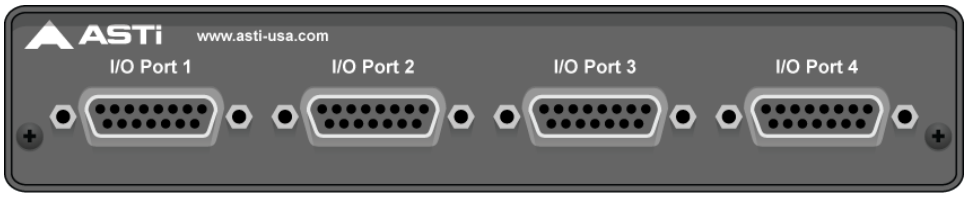

Figure 2: Front panel of AI-Tango

The rear panel features two DB-15 connectors, a status indicator, and a Power over Ethernet (PoE) port:

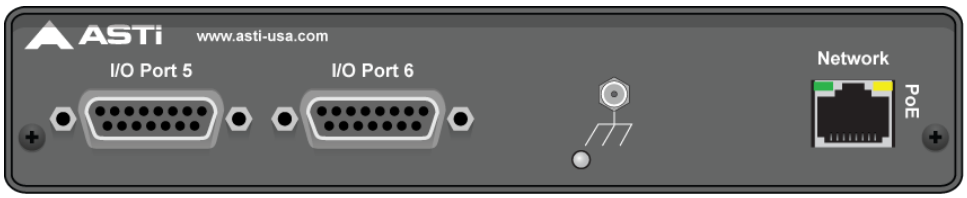

Figure 3: Rear panel of AI-Tango

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4.0 Dimensions

The AI-Tango has two bezels, encompassing the front and rear panels. The AI-Tango is Conformitè Europèene (CE)/Restriction of Hazardous Substances (RoHS) certified. Removing the bezels voids the CE certification.

***Caution**: This equipment is not suitable for use in locations where children are likely to be present.*

The AI-Tango includes a front and rear bezel with two screws:

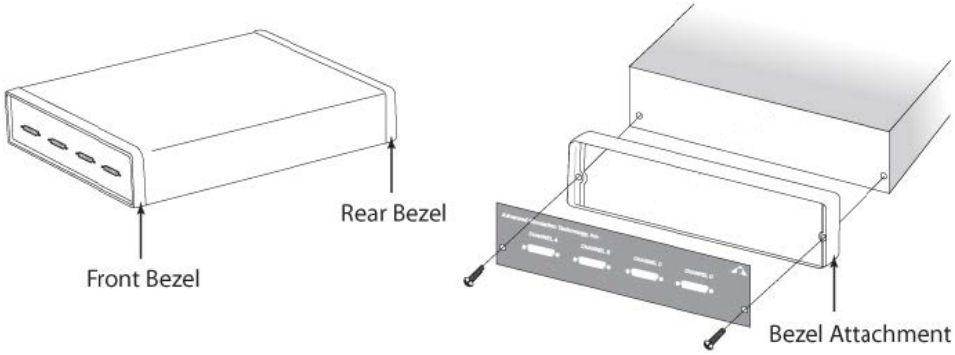

Figure 4: AI-Tango bezel

Figure 5, "AI-Tango bezel side dimensions" below shows AI-Tango bezel side dimensions:

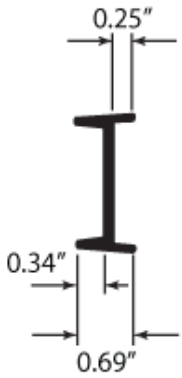

Figure 5: AI-Tango bezel side dimensions

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Table 2, "Dimensions for AI-Tangos with bezels" below shows the length, width, and height of the AI-Tango:

Specification	Measurement
Length (i.e., depth)	7.9"
Width	7.489"
Height	1.724"

Table 2: Dimensions for AI-Tangos with bezels

Figure 6, "AI-Tango dimensions" below shows AI-Tango height and width dimensions:

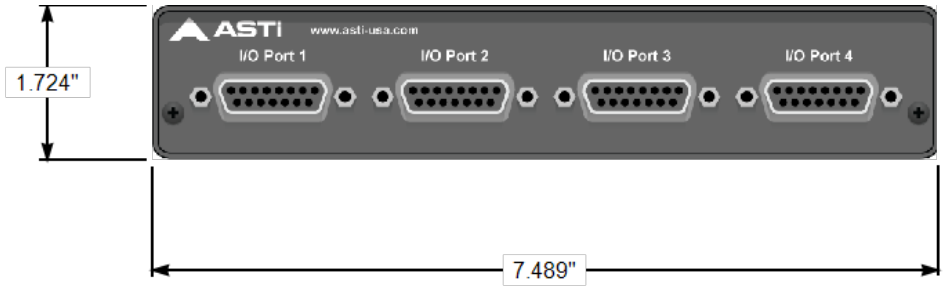

Figure 6: AI-Tango dimensions

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5.0 I/O interface pinout

Figure 7, "AI-Tango I/O interface pinout" below shows the DB-15 connector pinout for the AI-Tango:

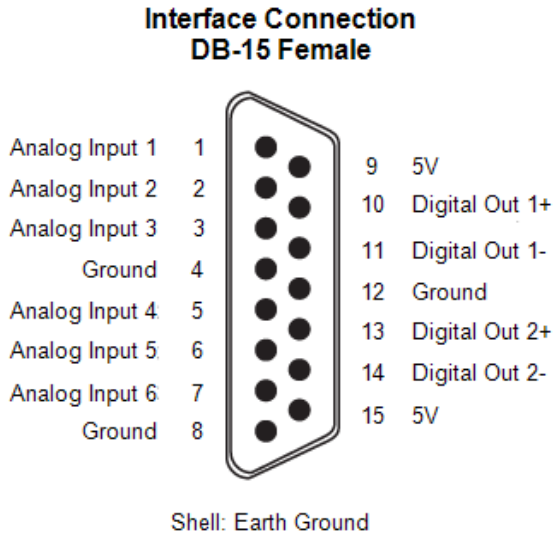

Figure 7: AI-Tango I/O interface pinout

***Note**: Pins 9 and 15 are current limited via a fuse.*

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6.0 Analog inputs

Figure 8, "Analog input circuitry" below shows the AI-Tango's analog input circuitry.

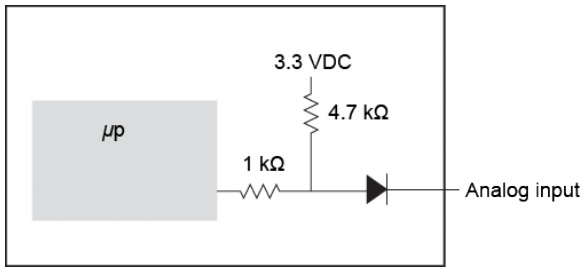

Figure 8: Analog input circuitry

This section provides several examples illustrating how you might use the AI-Tango's analog inputs:

- Analog input for a toggle switch
- Analog input for resistance

6.1 Analog input for a toggle switch

To use the analog input with a toggle switch, simply connect the switch to the analog input and ground pins, as the example below illustrates:

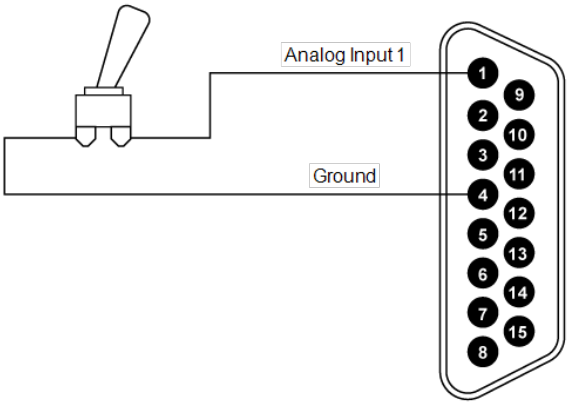

Figure 9: Analog input with a switch

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6.2 Analog input for resistance

In this example, insert a resistance between the analog input and analog input ground pins. The four-channel selector knob contains a switch that changes the resistance between the analog input and analog input ground pins, as shown below:

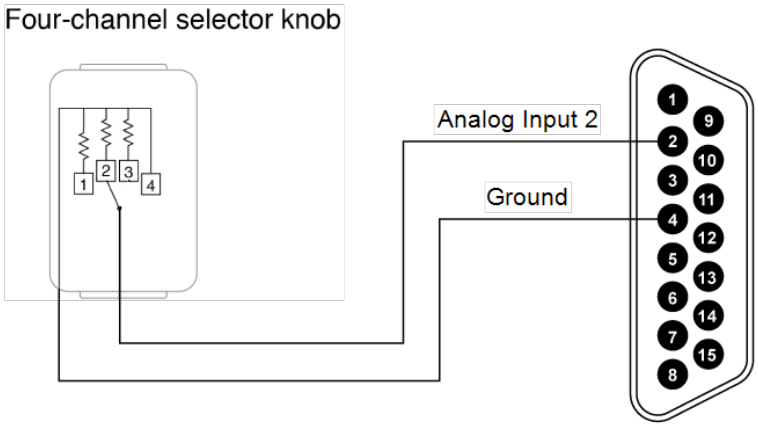

Figure 10: Analog In

You can also connect the AI-Tango to a potentiometer for various control applications. Connect the wiper to the analog input and the low side to the corresponding ground pin, as shown in Figure 11, "Potentiometer connection to the AI-Tango" below.

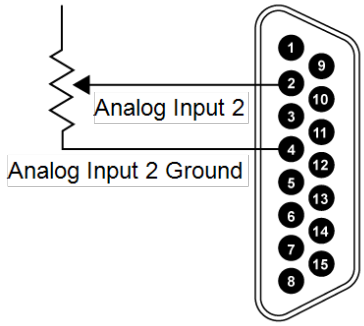

Figure 11: Potentiometer connection to the AI-Tango

***Important**: Do not connect the potentiometer to an external voltage source, which may cause incorrect readings. The AI-Tango already includes internal BIAS voltage.*

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7.0 Digital output

The digital output circuitry consists of an opto-isolated, solid-state relay for switching power to external loads. Table 3, "Digital output rating and dissipation" below summarizes the AI-Tango's digital output opto-isolated field effect transistor (FET) values:

Type	Opto-isolated FET
Maximum continuous current rating	120 mA
Maximum power dissipation	300 mW

Table 3: Digital output rating and dissipation

Figure 12, "Digital output circuitry" below shows the AI-Tango's digital output circuitry:

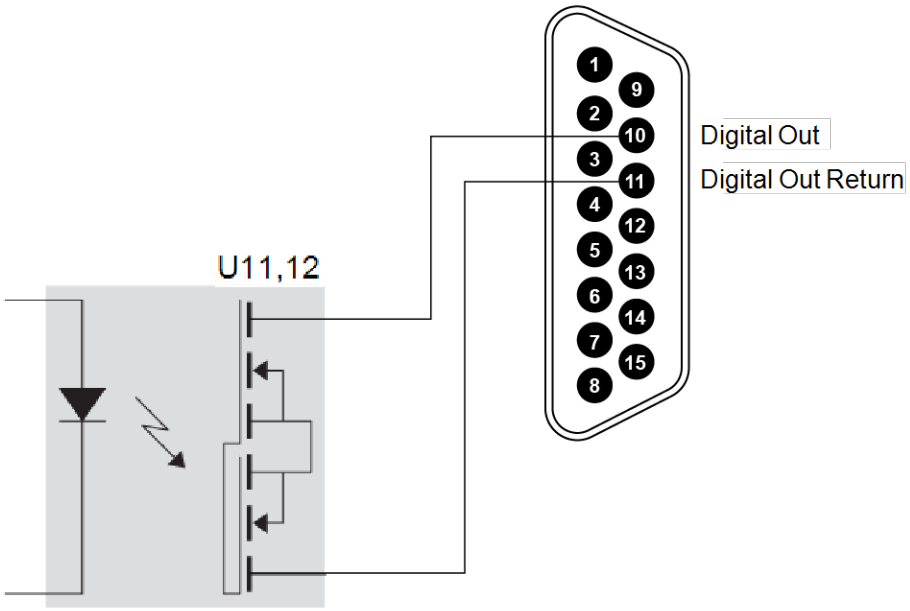

Figure 12: Digital output circuitry

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8.0 Status indicator lights

The LED status indicator light displays the AI-Tango's status:

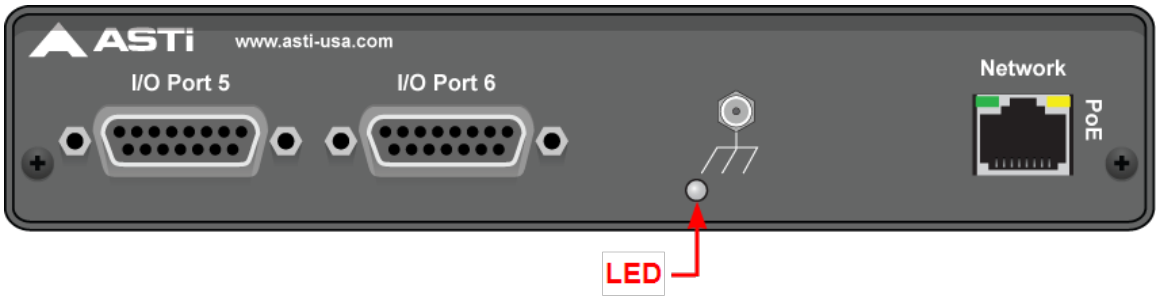

Figure 13: AI-Tango status indicator lights

Table 4, "AI-Tango status indicator lights" below defines each status indicator light for the AI-Tango:

LED Light	Status
White solid	This light indicates the AI-Tango's default “Power On” state. If solid white displays for over two minutes, remove power, count to 10, and reapply power, or contact support@asti-usa.com.
Yellow solid	The AI-Tango has booted and is awaiting configuration.
Yellow flashing	The AI-Tango is updating. Do not turn off the device.
Red solid	Hardware Error #1: failed to find device; remove power, count to 10, and reapply power, or contact support@asti-usa.com.
Red flashing	Network Error: the AI-Tango cannot send packets to the destination address.
Purple flashing	**Find Me** is enabled. This feature can identify an AI-Tango.
Blue solid	The AI-Tango is sending status packets to its destination address but is not receiving status packets.
Green flashing	The AI-Tango is sending and receiving status packets to and from its destination address. ***Note:*** *The AI-Tango can receive from any address, not just its configured destination.*
Off	Firmware Error #2: remove and reapply power, or contact support@asti-usa.com.

Table 4: AI-Tango status indicator lights

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9.0 Memory devices

Table 5, "AI-Tango memory" below summarizes the types of memory devices in the AI-Tango:

Type	Size	User Modifiable	Function	Process to Clear
Volatile				
CPU cache	1 MB	No	Internal cache for CPU	Remove Power Count to 30 Restore Power
RAM	2 GB	No	RAM	Remove Power Count to 30 Restore Power
Nonvolatile				
eMMC	8 GB	Yes	Application	Contact ASTi for more information.
EEPROM	512 kB	No	Bootloader	None
EEPROM	32 kB	No	Device ID	None

Table 5: AI-Tango memory

Table 6, "AI-Tango environmental ranges" below summarizes the AI-Tango's environmental ranges:

Range Type	Suggested Range
Operating temperature	0°C to +32°C (32°F to 90°F)
Operating maximum temperature gradient	20°C (68°F) per hour
Operating humidity	10–70 percent noncondensing
Storage temperature	-10°C to 55°C (14°F to 135°F)
Storage maximum temperature gradient	30°C (86°F) per hour
Storage humidity	5–95 percent
Maximum altitude	2,000 meters

Table 6: AI-Tango environmental ranges

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10.0 Rackmount

The available rackmounting bracket accommodates two AI-Tangos side by side and measures 1U high and 19" wide. To rackmount the AI-Tango, follow these steps:

1. Remove the two bottom corner screws on the front of the AI-Tango.
2. Use a nut driver (3/16") to remove the two jackscrews from each side of the four connectors.
3. Remove the faceplate with the white lettering and the bezel. Save the bezel for when you remove the AI-Tango from the rackmount.
4. Place the AI-Tango into the backside of the rackmount. The rackmount fits in place of the bezel.
5. Place the faceplate on the front side of the rackmount, and install the two black screws.
6. Install the jackscrews on each side of the four connectors.

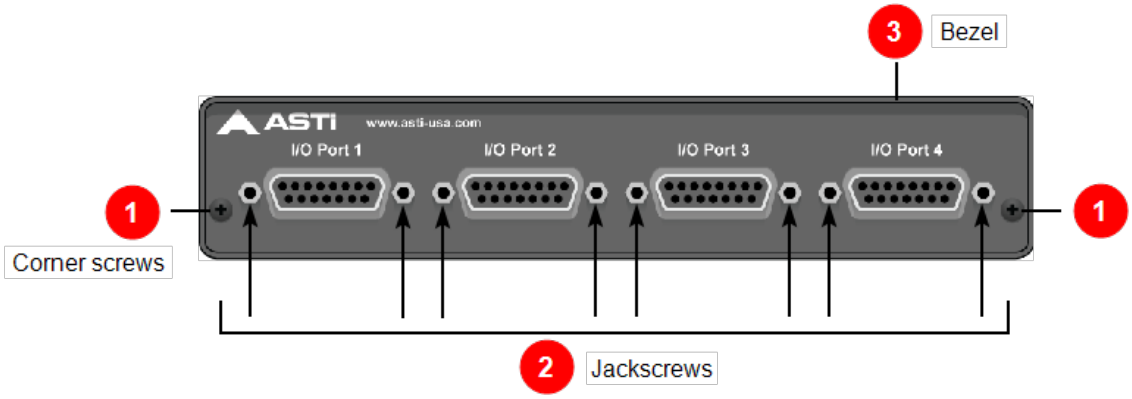

Figure 14: AI-Tango rackmount installation

***Note**: The included rackmount kits are compatible with a variety of ASTi distribution devices (e.g., ACU2s, AI-Tangos). As a result, you can mount different device types next to each other in the same rack. Go to the original manufacturer's documentation for more information about rackmount installation.*

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Appendix A: Warranty information

To view ASTi's warranty, go to “Standard Terms and Conditions” at www.asti-usa.-com/legal/terms.html.

***Important**: This device does not contain any user-serviceable components. Opening the ASTi Server chassis voids the warranty. ASTi does not support board-level repair; therefore fuses in the device are not user replaceable.*

A-1 Repairs and returns

To return equipment to ASTi, observe the following procedures:

1. Request a Return Material Authorization (RMA) number through the form on the RMA User Account at rma.asti-usa.com/rma. ASTi's Production department cannot receive a repair without an RMA number. The shipping label must also include the RMA number. Any items received from customers without RMA numbers or appropriate contact information will not be tested. After 60 days, ASTi reserves the right to scrap all hardware received in this condition.
2. When packaging the equipment in question, make sure it is well-protected. Failure to properly package the equipment during shipping could void the warranty.
   - Always double-box the device.
   - The inner container should employ some semi-rigid, contour-fitting foam, while the exterior container should use a more pliant, shock-absorbing material, such as styrofoam peanuts.
   - To prevent possible Electrostatic Discharge (ESD) damage, properly enclose the device in an antistatic bag.
3. Do not send accessory pieces, such as rack mount kits, power supplies, or software. Only include items that do not work.
4. Describe the problem, noting the following information:
   - Serial number for the unit in question
   - Point of contact information (i.e., name, telephone number, and equipment return address)

   Failure to include this information could extensively delay the return of equipment.
5. If you are an international customer, include the correct product value on all shipping documents. For proper harmonized tariff codes, contact ASTi. The customer is responsible for duties, taxes, and fees incurred during shipment.

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ASTi evaluates equipment free of charge and will not start work without prior customer approval.

You are responsible for shipping charges to ASTi for warranty and non-warranty repairs. If equipment is not under warranty, a purchase order is required to cover any repairs. ASTi will provide a quote for all nonwarranty items, including return shipping. The customer is responsible for return shipping charges on nonwarranty equipment. ASTi ships equipment still under warranty back to the customer via FedEx, unless otherwise directed. ASTi is responsible for return shipping charges on domestic items under warranty.

If ASTi does not receive the equipment 30 days after the RMA was issued, ASTi closes the RMA and designates it as unused.

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