MONARCH INSTRUMENT

Instruction Manual

Track-It™ Pressure Transmitter with Digital Display

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SAFEGUARD AND PRECAUTIONS

1. Read and follow all instructions in this manual carefully, and retain this manual for future reference.
2. Do not open the unit in a high humidity environment; it will cause condensation inside the unit.
3. Do not operate this device in flammable or explosive atmospheres.
4. This device has no power switch. It will be in operation as soon as power is connected.
5. Do not use this instrument in any manner inconsistent with these operating instructions or under any conditions that exceed the environmental specifications stated.
6. There are no user serviceable parts in this instrument. Refer service to a qualified technician.

In order to comply with EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE): This product may contain material which could be hazardous to human health and the environment. DO NOT DISPOSE of this product as unsorted municipal waste. This product needs to be RECYCLED in accordance with local regulations; contact your local authorities for more information. This product may be returnable to your distributor for recycling; contact the distributor for details.

Monarch Instrument's Limited Warranty applies.
See www.monarchinstrument.com for details.

Warranty Registration and Extended Warranty Coverage information is available online at www.monarchinstrument.com.

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1.0 DESCRIPTION

The Track-It Pressure Transmitter with Display is a 24V DC powered watertight (IP65) compact data logger with an isolated 4 to 20mA current transmitter output for pressure.

It can be configured to record both pressure and temperature up to 130,000 samples or pressure alone, to maximize data storage space. Real-time data, alarms, and min/max information can be displayed on the multiline LCD. The pressure transmitter output current (4-20mA) can be scaled by the user to provide maximum resolution over the desired pressure span. Power and mA out connection is via a 4 pin DIN 43650 IP65 connector on the rear panel. The unit is easily configured using the free downloadable Track-It™ PC Software. There is a mini USB connector on the rear of the unit allowing connection to a PC for programming and data download. Data download can also be done with an Android™ device using the Transporter App available on the Google Play™ store.

The Transmitter can be programmed to record data from once every two seconds to once a day. The recording can be initiated by the user to commence immediately, manually via the keypad buttons, at some preset time in the future, or on an alarm condition. Current output does not depend on record rate or sample rate; it updates in real-time at approximately 8 times per second.

The display can be programmed to display pressure in various engineering units depending on pressure range. It can also display temperature, minimum and maximum values, percentage of memory used, time and date.

The Track-It Pressure Transmitter with Display has a rugged watertight anodized aluminum and stainless steel housing. The pressure sensor has a standard ¼"-NPT or ½"-NPT fitting.

2.0 GETTING STARTED

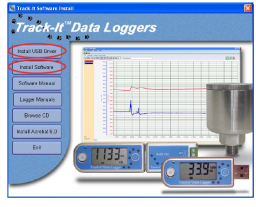
2.1 Install USB Driver and Track-It Software

IMPORTANT: Do NOT plug the Track-It Pressure Transmitter into the USB port until AFTER the USB Driver and Track-It Software have been installed.

Download Track-It Data Logger Software from:
http://www.monarchinstrument.com/Software/Track_It_Software.zip

Unzip the downloaded file to a local directory on your PC.

Double-click *CD_Start.exe*. This will launch the Track-It Data Loggers installation screen shown right:



1. Click *Install the USB Driver* and follow the prompts. Click *Continue Anyway* if you see the message about software installation.

2. Click *Install Software* and follow the instructions to complete the installation. The software is now ready for use.

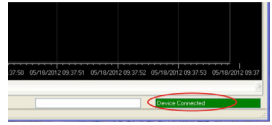
Logger and software manuals may also be accessed from the installation screen.

2.2 Connect Transmitter and Start Track-It Software

Plug the Track-It Pressure Transmitter into an available USB port on the PC using the supplied cable. If the *Found New Hardware Wizard* appears, follow the prompts to complete the installation.

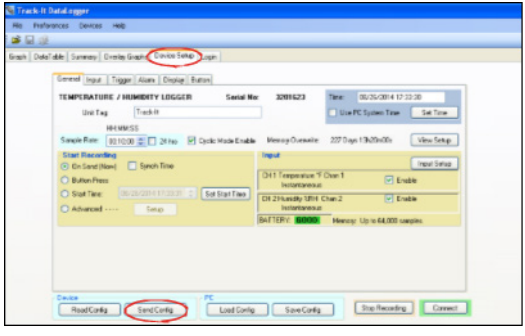
Start the Track-It Software by double-clicking the Track-It icon on your PC desktop or from the Start menu.

If the USB driver is installed properly, you will see *Device Connected* displayed in the lower right-hand corner of the Track-It Software window.



2.3 Configure Transmitter

Select the *Device Setup* tab as shown below. The software will automatically retrieve and display the transmitter configuration.



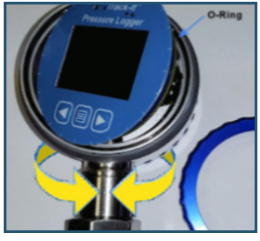
Review default factory configuration settings and make any necessary changes — sample rates, triggers, alarms, etc. Be sure that the time and date is set properly.

Click the *Send Config* button under the Device Configuration section of the window. Your Pressure Transmitter is now operational!

3.0 INSTALLATION

The Pressure Transmitter can be ordered with various pressure sensor ranges to cover most applications. Sensors have a ¼" NPT or ½"-NPT thread, dependent on pressure range, that is intended to screw into the pressure source. Make sure to use suitable tape or thread sealant/dope on the threads before inserting the Transmitter into the port. Use an adjustable wrench on the SENSOR NUT to tighten the device into the port and test for leaks.

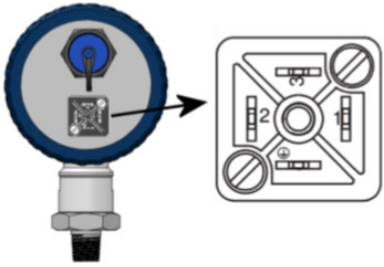
Once installed the dial can be rotated 300 degrees about the sensor to the intended viewing direction. The gauge face can also be rotated ±90 degrees by undoing the blue bezel, lifting the front panel and associated electronics and rotating it to the desired position. Ensure the gasket/o-ring is in place before replacing the bezel. Do not stress any of the internal wiring.



3.1 Vent

All gauge (PSIG) sensors are vented to atmosphere through a small hole on the rear cover. DO NOT cover or block the vent or the transmitter may read incorrectly. DO NOT insert anything into the vent hole as it may damage the waterproof membrane.

4.0 POWER / TRANSMITTER CONNECTIONS

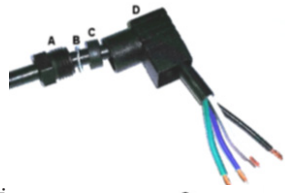


The transmitter has a 4-pole DIN43650 connector on the rear panel for power and current out connections.

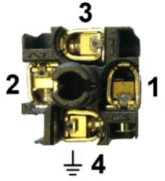
A mating plug (Hirschmann GDS 307) and flat gasket (Hirschmann GDS 307-4) are supplied. The plug is a Form C connector with 3 Poles + Ground, 9.4 mm pin spacing, with a black fiberglass reinforced polyamide housing, and a PG 7 cable entry which accommodates a 4.5 mm to 6 mm (0.177 to 0.236 inch) cable. It has screw termination connections for field installation and is water and dust proof to IP65 standards when used with the supplied gasket. The cover can be inserted on the inner plug in one of four 90° orientations.

The output is an isolated 4 to 20mA current source with a 12VDC compliance voltage capable of driving loads up to 600 Ohms with 24VDC power.

To connect, remove the screw and plug base from the housing. Thread the cable through the PG7 gland (A), metal washer (B) and rubber washer (C). Insert the wires into the plug housing (D) and strip the wire ends ~0.24" (6mm).

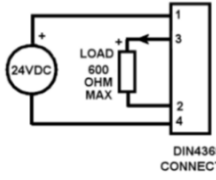


The plug has four compression screw connections. Match pin numbers printed on the connector against numbers displayed in the image right – note that pin 4 is not marked and is the ground pin - ⏚.

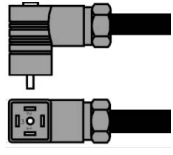


Make a note of the wire colors, insert the stripped ends of the wires into the connections and secure with the screw. The connections are as follows:

1. Power +24V DC
2. mA isolated output -
3. mA isolated output +
4. Power 24VDC COM



Once wired, insert the plug into the housing – note the orientation of the plug housing. When connecting the plug to the socket ensure the gasket is between the plug and socket. Tighten the screw.



5.0 BUTTONS AND MENU

If the display is off, pressing any button will turn it on for the duration set in the Track-It PC Software.

There are 3 buttons: ◄ (left arrow), MENU ☰ and ► (right arrow).

Pressing the ◄ or ► buttons will scroll through the various display values as set in the Track-It PC Software. This includes Pressure, Temperature, Date/Time, Memory Usage, Max/Min for Pressure and/or Temperature.

5.1 Menu Modes

There are two menu modes: the **Normal** menu and the **Admin** menu. What is visible in each menu is a function of how the device is programmed using the PC software. See 8.5 Menu Setup for details. Some menu items are context sensitive.

The **Normal** menu is accessed by pressing the MENU ☰ button.

The **Admin** menu is accessed by pressing and holding the ◄ (left arrow) button then pressing the MENU ☰ button.

In the menu mode, the ◄ button is the escape or exit button, the ► button is the accept/change button, and the MENU button will move to the next menu item. The display will automatically exit back to the real-time display if there is no activity for 10 seconds.

The content of each menu is set up in the Track-It PC Software. In addition, the admin menu can be locked; in this situation, the user at the Transmitter cannot enter this menu and will receive a LOCK message. See 8.5 Menu Setup for details.

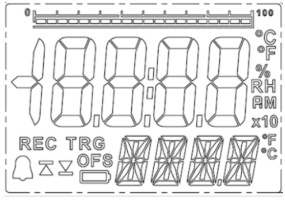
5.2 Menu Options

The list on the next page is in alphabetical order. Please note that the actual order in which these items appear is dependent on settings set in the Track-It PC Software.

Backlight	**BKLT** – AUtO/OFF — In Auto mode, the backlight will come on whenever a button is pressed. It will stay illuminated as long as the LCD remains on (user definable). If the LCD is configured to stay on indefinitely, the backlight will also remain on. The backlight can be disabled by selecting OFF Press ► button to toggle auto/off status.
Clear Alarm	**Clr ALRM** – Will clear any pending Alarm. Press ► button to clear. (Only visible during Alarm)
Clear Minimum	**Clr MIN** – Will clear minimum values for Pressure and/or Temperature. Press ► button to clear. It depends on whether Pressure or Temperature is displayed when menu is pressed, and if Pressure maximum is selected in the display menu in the Track-It Software.
Clear Maximum	**Clr MAX** – Same as above for Maximum.
Cycle Mode	**CYCL** – On/OFF – If on display will toggle between Pressure and Temperature.
Bar Graph	**BAR** – On/OFF – Turns the bar graph on or off. Press ► button to toggle on/off status.
Decimal Point	**DCPT** – AUtO, 0, 1 – Used to set preferred number of decimal places. Auto will use all the digits and adjust the number of digits after the decimal accordingly.

Engineering Units	**Unit** – Used to change the engineering units for the pressure display. The lower line will show the current engineering units. Use the ► to scroll through the available units and press ◄ to accept. Not all units are available depending on the full scale value of the sensor. The choice is limited by the number of digits on the display.
Record On/Off	**rEC** – ON/OFF – Will toggle the record mode of the unit (Only visible if record mode set to "Button Press" in the Track-It PC Software). Press ► button to toggle on/off status.
Zero Mode	**ZERO – OFF/EnAb** – Will enable the zero offset feature. Available only in the Admin menu. If Off (not enabled) the Zero Set menu item will not display.
Zero Set	**ZERO – SEt/OFF** – Will set the current Pressure value to zero (offset into relative mode). Press ► button to toggle between modes. SEt will activate relative mode, OFF will set to absolute mode. NOTE: When set, the OFS icon will show on the display. This menu item is only visible if the Zero Mode is enabled in the Admin menu and the Admin menu is NOT Locked.

6.0 LCD



The display has 4½ 7-segment digits to show actual values of pressure and temperature. There is also a line of 4 alphanumeric digits used to display ASCII text (e.g. Pressure Units). The display is optionally backlit; the backlight is initiated for 5 seconds by pressing any button. If the pressure is greater than 19999, the resolution is set to 10 units and is indicated by the x10 icon. The maximum value displayed is therefore 199990.

There is a bar graph at the top of the display (which can be turned off by the user) giving an analog indication of values relative to 100% which is the full scale value of the sensor. Note that in the Pressure Offset mode, the bar graph indicates the absolute value of the pressure as a function of full scale.

In addition to these values, the display can be scrolled using the ◄ or ► buttons and may show (depending on configuration) minimum and maximum values of pressure and temperature, date as day/month - 24.07 or month/day - 07.24, time in 12 or 24-hour format (12-hour format will be indicated by AM or PM – 08:30 AM), and memory usage as a % of available memory. Values shown are set in the display setup using the Track-It PC Software. See 8.4 Display Setup on page 18 for details.

There are various icon indications on the display that indicate the following:

REC Indicates the unit is currently recording. This icon will blink at a 2 second rate.

TRG Indicates the unit is currently triggered and waiting to record. Record is initiated by time delay or button depending on configuration.

Indicates an Alarm condition; High Alarm and Low Alarm

On its own (no Alarm), indicates Maximum value. Visible when scrolling through display if set.

On its own (no Alarm), indicates Minimum value. Visible when scrolling through display if set.

OFS Indicates the reading has been offset and is relative. (Zero mode active.)

x10 Indicates the current numerical value displayed must be multiplied by 10.

Bar graph shows percentage of full scale (0 to 100%) of the value indicated. This can indicate Pressure, Temperature or percentage of memory used when recording. Note that in the Pressure Offset mode, the bar graph will show the percentage of full scale of the absolute value not the offset value currently displayed. The bar can be disabled in the menu.

7.0 LED

There is an LED (Light Emitting Diode) above the display to the left. This LED is user programmable using the Track-It PC Software and can indicate that the unit is recording (green blink) or an Alarm condition exists (red blink). It will also blink green when serial communication is taking place through the USB port.

8.0 TRACK-IT SOFTWARE

IMPORTANT: Before using your Track-It Pressure Transmitter it needs to be configured. You must first download and install the USB Drivers and PC Software. Please refer to Section "2.0 GETTING STARTED".

The free Track-It Software runs on a PC and gives the user complete control in programming the Transmitter and allows for the upload, examination and archiving of data recorded on the Transmitter and setting the current output. The operation of the Track-It Software is described in its own manual which is accessed via the Help - Manual option.

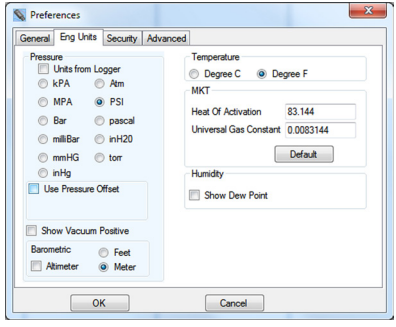
Some of the features of Track-It Software are:

- Delayed recordings, fixed duration recordings by time or number of samples, multiple record times, manual record by button press, record on alarms
- Sample rates from 2 seconds to 24 hours. Instantaneous, average, maximum or minimum values
- Two Alarms (High or Low), latched or momentary and record under these alarm conditions
- Display of data graphically, digitally or tabular formats with alarm indication
- Export user selected data in CSV formats for import into Excel®; filter data to be exported
- Scale output current to user specified pressure range

There are a number of unique options specifically for this Track-It Pressure Transmitter with Digital Display which are covered in the following sections.

8.1 Preferences

Select *Preferences* then the *Eng Units* tab. You will see the pop-up box shown below.



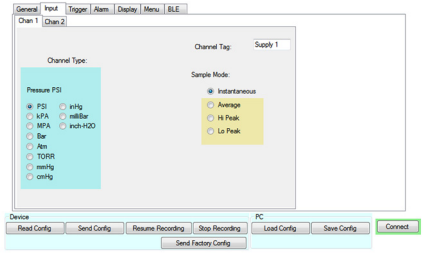
These Engineering Units apply to the data read from the Transmitter and displayed on the graph or in the data table.

If the *Units from Logger* box is checked - the selection of engineering units here is ignored and the engineering units used will be as set by default in the Transmitter. If the *Units from Logger* box is unchecked, then the unit selected here will override that set in the Transmitter.

8.2 Input Setup

Under the *Device Setup* tab, select the *Input* tab and the *Chan 1* tab.

This setting allows the user to select the default engineering units that will be displayed on the Transmitter LCD. Note that not all engineering units are available; it depends on the full-scale range of the pressure sensor, as some values will be too large to display on the Transmitter. Note also that these units may be changed locally at the Transmitter if the menu is set up to allow this. See 8.5 Menu Setup for details.



The units selected here will be used when reading data from the Transmitter unless overridden in the Preferences menu.

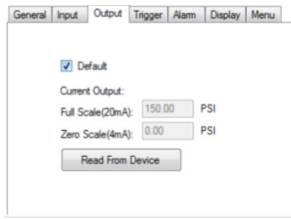
The Pressure channel cannot be disabled – the Transmitter will always record Pressure.

Note that selecting anything other than *Instantaneous* for Sample Mode (the Transmitter only takes a reading at the Record Rate) will cause the Transmitter to take readings at the highest sample rate.

The *Chan 2* tab is similar but for the Temperature channel. The Temperature channel can be disabled in which case the Transmitter will only record Pressure, not Temperature and Pressure.

8.3 Output Setup

The current output can be scaled by the user. Under the *Device Setup* tab select the *Output* tab. This will display the setting for the current output of the attached device. The user can set the pressure values corresponding to the 4mA or zero scale and 20mA or full scale output. The Transmitter will scale the output linearly to pressure between the two set-points.



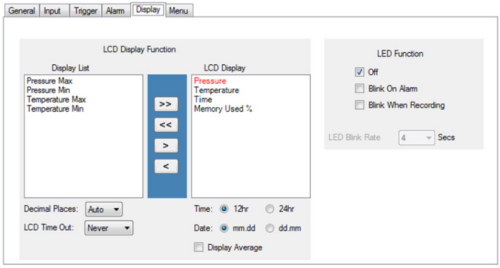
If *Default* is checked the output will be 4mA at 0 pressure and 20mA at the full scale pressure of the device. The scaling cannot be changed in default mode. The pressure is set and shown in the units selected under the *Input* tab.

The settings from the attached device can be refreshed using the *Read from Device* button if not in default mode.

NOTE: The new settings will not be updated in the device until the user sends a configuration file using the *Send Config* button.

8.4 Display Setup

Under the *Device Setup* tab select the *Display* tab.



These settings allow the user to decide what is displayed on the Transmitter LCD and defines the function of the LED.

The *Display List* column shows the available functions that are available to be displayed on the Transmitter. The *LCD Display* column are the functions that will be displayed on the Transmitter. The user can move the options between the columns by selecting the option (clicking on it) and using the arrow keys. Note that Pressure cannot be moved from the LCD.

Decimal Places will define how the data is displayed. Auto will always use the maximum number of digits available.

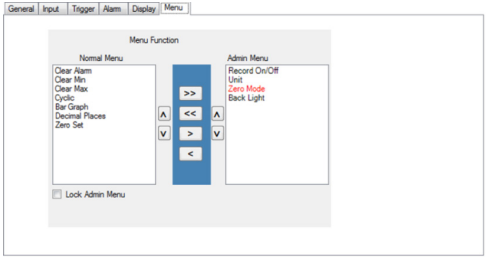
LCD Time Out determines how long the LCD will be on before blanking.

The *Time* and *Date* formats can be selected as shown.

The *Display Average* checkbox enables the real-time update to be a rolling average of the last four readings. This will quiet a noisy display but does affect the response of the readout.

8.5 Menu Setup

Under the *Device Setup* tab select the *Menu* tab.



This setting allows the user to determine which menu functions appear in the Normal menu and which appear in the Admin menu. Menu items will appear in the Transmitter menus in the order of top to bottom in the lists. By highlighting a menu item (clicking on it) the user can manipulate its position using the arrow buttons. The Zero Mode cannot be moved from the Admin menu.

If the *Lock Admin Menu* box is checked the user will not be able to access the Admin Menu features at the Transmitter, and the Zero Set menu option (display offset) will not be available in the Normal Menu.

9.0 TRACK-IT TRANSPORT APP

Track-It Transport is a free Application for Android that allows you to use your mobile device to start and stop recording and transfer data using a USB On-the-Go cable.

https://play.google.com/store/apps/details?id=com.trackit.transporter

10.0 SPECIFICATIONS

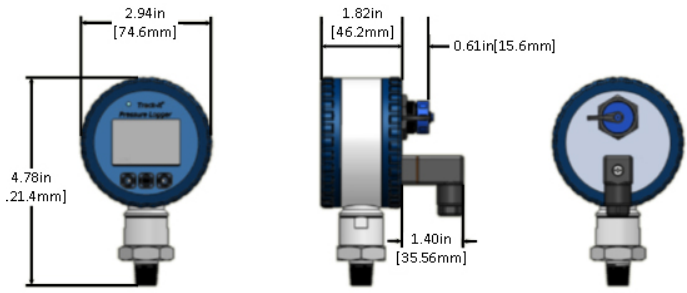
10.1 Measurement

Pressure Ranges	Various pressure ranges absolute and gauge (check ordering information)
Accuracy	±0.25% Full Scale typical (includes linearity, repeatability and hysteresis)
Resolution	0.01%. Display 4½ Digits Max 2 decimal places
Compensated Range	-10°C to +70°C typical
Temperature Coefficient	0.02% Full Scale/°C (> 580 PSI or 4 MPa) 0.03% Full Scale/°C (< 580 PSI or 4 MPa)
Overpressure Rating	1.5 times max
Port connection	¼" or ½" NPT Male
Sensor Housing & Diaphragm	Stainless Steel 316L Fill: Silicon Oil
Temperature Range	-4 to 185°F / -20 to +85°C Accuracy: ± 5°C Resolution: 0.2°F / 0.1°C

10.2 General

Record: Sample Rates	User configured 1 every 2 seconds up to 1 every 24 hours
Record: No. of Samples	130,000 (dependent upon setup), non-user serviceable, battery-backed, non-volatile memory
Record Trigger	Two independent triggers Multiple trigger modes: Instantaneous, button control, on alarm, time and date (start and stop), day of week
Record Mode	Fill to end of memory or cyclic, number of samples, time duration
Display	Two-line, 4½-digit 7-segment LCD and 4-digit alphanumeric display with custom icons, multi-segment bar graph for 0-100% indication, backlit
Alarms	2 user-programmable alarms (High or Low)
Communication	Mini USB connection
Software	Track-It Software—Program device, view data (historic or real-time), export to spreadsheet.
Enclosure	Anodized Aluminum and 316L Stainless Steel
Dimensions	2.94" (74.6mm) diameter x 1.82" (46.3mm) deep x 4.78" (121.4mm) tall including port threads *(See diagram on page 19)*
Weight	0.85 lbs. (385.55 grams)
Power	24VDC ±10% 1.2W max

Note: Specifications are subject to change without notice.



10.3 Isolated Current Output

Range	4 to 20mA (Min. 3.6mA, Max. 21.5mA) User scalable for pressure
Isolation	500V to 24VDC power
Compliance Voltage	12VDC @24Vdc supply (Min 11V @21.6VDC supply)
Accuracy	±0.06%
Resolution	6µA
Update Rate	125 msec typical

10.4 Operating Environment

Temperature	-4 °F to 185 °F / -20°C to +85°C
Humidity	0-100%
Environmental	IP65 (USB Connector cover must be in place)

10.5 Compliance

10.5.1 Battery Compliance

There is a non-serviceable Lithium battery used in this product which meets the requirements of UN DOT 38.3.

10.5.2 EU Declaration of Conformity

CE Compliant. Please visit our website's Certificate, Regulatory Compliance and CE Declaration page to download our EU Declaration of Conformity for this product.

11.0 ACCESSORIES

DIN Rail 24VDC Power Supply		PN: 5380-511
Replacement Gaskets, 2-pack for units with S/N ≥4103275		PN: 5396-9919
Replacement O-ring Seal, 2-pack for units with S/N <4103275		PN: 5396-9916
USB 2.0 to 2.0 mini 3 ft. cable		PN: 5396-9911
Replacement DIN46350 Mating Plug and Gasket		PN: 5396-9917
Track-It Calibration Software		PN: 5396-9915

For additional accessories and details, see webpage.

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