

## VECTRO2 FOR UNIVERSAL ROBOTS QUICK START GUIDE

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**D21-2027**



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## 1. Introduction

The Vectro2 data collector provides fast, repeatable, high-precision non-contact measurement in a package designed for easy and continuous use. The Vectro2 data collector is compatible with the T-series of sensors.

Vectro2 expansion pack for UR consists of a sensor mount, URcap software and licence and user guide.

This manual assumes the user is familiar with the standard operation of Vectros and Universal Robots e-Series products.

## 2. Safety

### 2.1. Laser safety



Class 2M Laser

The laser complies with IEC60825-1 AM2:2001. Because your blink reflex provides enough protection, it is called eye safe

- Do not shine in eyes
- Do not view with optical instruments
- Do not shine in open space
- Take care around reflective surfaces

### 2.2. Robot safety

Safety measures should be employed prior to installation and set-up, please refer to Universal Robot e-Series User Manual for safety information.

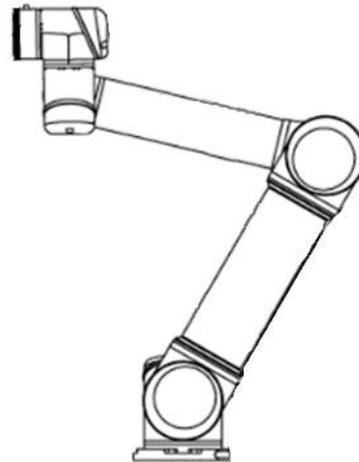
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### 3. Putting the system together

#### 3.1. Unpack the robot

Unpack your robot, using the instructions provided by Universal Robots.

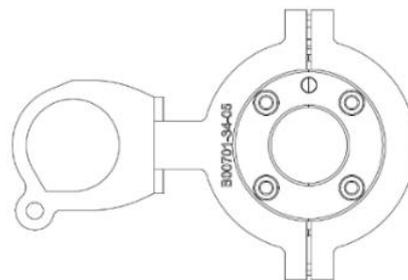
1. Place the robot in a position similar to the one shown.



#### 3.2. Cable management

Install the cable management onto the robot using the manufacturer's instructions. We recommend the following if using a cable management purchased from Third Dimension Software Ltd.

1. Feed the SMA cable through the hose before attaching to the robot arm.
2. When attaching the holder with clamp to the robot, position the split line of the bracket so that it is parallel with the non-threaded hole as shown.



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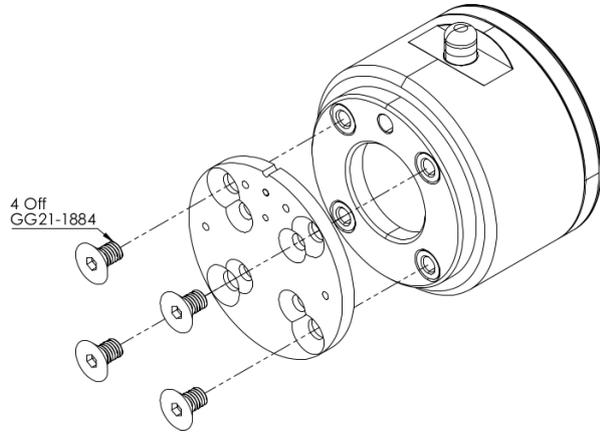
### 3.3. Sensor mount

Installation of sensor mount to tool flange. (It is recommended you rotate Wrist 2 using the Freedrive button to face the Tool Flange upwards.)

1. Fit the mating plate using the M6 x 10 screws provided. Screws need to be hand tight.

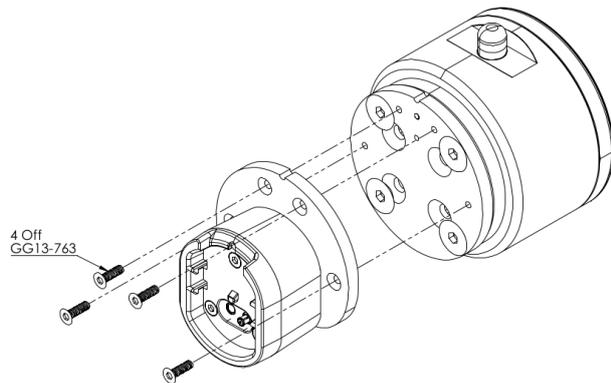
Note that the pre-fitted screw's head will fit into the non-threaded hole.

 Tool required: 4mm Allen key or hex driver.



2. Attach the assembled part of the sensor mount to the mating plate using M3 x 10 countersink screws (x4). Screws need to be hand tight.

 Tool required: 2mm Allen key or hex driver.

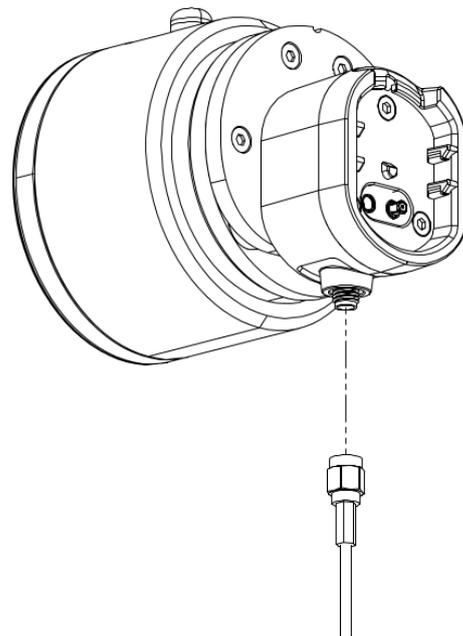


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3. Ensure that there is no sensor in the sensor mount.
4. Screw the male SMA connector to the female SMA connector on the sensor mount. Tighten until the SMA cable stops rotating then a further ¼ turn.



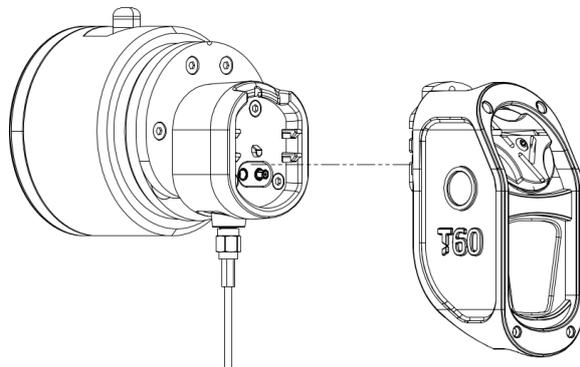
Tool required: 8mm spanner



### 3.4. Attaching the sensor

1. Align the sensor with VChange2 pod on the sensor mount.
2. Push the sensor onto the sensor mount until you hear it click.

To remove the sensor, push down the orange release tab on the sensor and pull the sensor off the mount.



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## 4. Configure robot

### 4.1. TCP (Tool Centre Point)

The TCP is the point used to move the robot to a Cartesian position. Below are the standard values for the T-Series sensors. The TCP menu is located: Installation -> General -> TCP.

Position	T60 (mm)
X	0
Y	0
Z	128

Rotation	T60 (rad)
RX	0
RY	0
RZ	0

### 4.2. Payload

The payload must be set correctly to prevent damage and for correct function of protective stops. The Payload menu is located: Installation -> General -> Payload.

Use the UR payload wizard to calculate payload mass and centre of gravity. Care must be taken not to touch the sensor during this process.

### 4.3. Installing the URCap

Included within the Vectro2 expansion pack for UR Robot there is a USB, this contains the Third Dimension URCap in the root directory. Install the software onto the robot and restart. The URCaps menu is located: Hamburger menu -> Settings -> System -> URCaps.

### 4.4. Network

Vectro2 and the robot communicate with each other via a LAN connection using TCP/IP. Both devices support IPv4, DHCP and static addressing.

Communication between Vectro2 and your robot requires the following ports and protocols:

TCP port 21050  
UDP port 21030

Any firewalls or routers on the network between the Vectro2 and the robot may need configuring to allow these ports to be used. Please consult your IT support team if you are unsure how to accomplish this.

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## 5. Connecting to the Vectro2

Before using the Vectro2 in a program you will need to connect to it and setup data output locations.

Enter into the Vectro installation by navigating through: Installation -> URCaps -> Vectro.

This should show the Vectro installation screen, similar to the one shown.

This is where you connect to the Vectro2, clicking the dropdown will present a list of Vectro and GapGun devices found on the local network.

If the device needed is not shown click the box and you can enter a hostname or IPv4 address.

Click 'Device enabled'

A green tick means the connection was successful.

Device enabled:

While a red cross & timeout means you need double check IP address and plug in connections, also the network connection if it persists.

Device enabled:  Timeout

Note: If the page says unlicensed you will need to update the license on the Vectro2 (as covered in the Vectro2 manual).

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## 6. Demo program

Here is a quick example of how-to setup a measurement using the Vectro2 and robot. In our example we are measuring a gap and flush artifact similar to the one included with your sensor head pack.

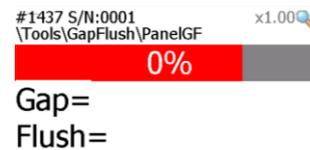
Care should be taken while moving the robot and all movement paths should be clear of obstructions.

1. Navigate to the tree view under the Program tab.
2. Set a waypoint in a safe position (here we have called it Start position)

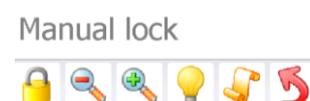
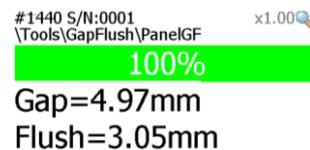
For example, the position shown in 3.1.

- 1 **Robot Program**
- 2 MoveJ
- 3 Start\_position

3. Confirm the sensor head is connected as per 3.4.
4. On the Vectro2 navigate to the tool required (in our case PanelGF).  
Tools -> GapFlush -> PanelGF.
5. Click on the padlock icon in the bottom left corner. The message should alternate between 'Bad range' and 'Manual lock'.

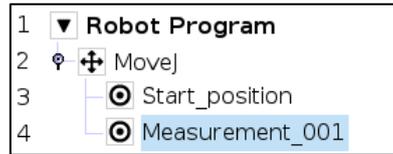


6. Position the robot so that the feature to measure is centred left and right on the screen.
7. Align the centre of the feature to the solid line on screen.
8. Unlock the measurement by clicking the padlock once more.

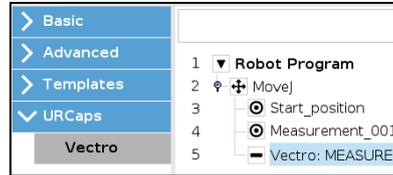


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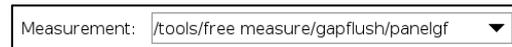
9. Create another waypoint, this one is where we will take the measurement (here we have called it Measurement\_001).



10. Add a Vectro2 Measure item.  
Program -> URCaps -> Vectro.



11. Select the appropriate tool from the drop-down box.



We will use panelgf.

12. Confirm all paths are clear and play to run the program on loop.

The robot will now move to the start position -> measure position -> take a measurement and then loop.

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## 7. Pack content

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GG21-2036	Software, Robot, UR, URcap, 1	
GG21-2081	Sensor mount, VChange2, ISO9409-1 50mm	
D21-2027	Manual, Vectro2 for UR, Quick start (this document)	

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