

## UCC T3-2 installation guide

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# UCC T3-2 installation guide

Documentation part number: H-1000-5254-01-A



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# General information

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### WEEE



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### Warranty

Renishaw plc warrants its equipment for a limited period (as set out in our Standard Terms and Conditions of Sale) provided that it is installed exactly as defined in associated Renishaw documentation.

Prior consent must be obtained from Renishaw if non-Renishaw equipment (e.g. interfaces and/or cabling) is to be used or substituted. Failure to comply with this will invalidate the Renishaw warranty.

Claims under warranty must be made from authorised service centres only, which may be advised by the supplier or distributor.

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### Care of equipment

Renishaw probes and associated systems are precision tools used for obtaining precise measurements and must therefore be treated with care.

### Changes to Renishaw products

Renishaw reserves the right to improve, change or modify its hardware or software without incurring any obligations to make changes to Renishaw equipment previously sold.

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### EC declaration of conformity

Renishaw plc hereby declares that the UCC T3-2 is in compliance with the essential requirements and other relevant provisions of Directives 2004/108/EC. Contact Renishaw plc if a copy is required.

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### FCC (USA only)

#### Information to user (47CFR section 15.105)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

#### Information to user (47CFR section 15.21)

The user is cautioned that any changes or modifications not expressly approved by Renishaw plc or an authorised representative could void the user's authority to operate the equipment.

#### Equipment label (47CFR section 15.19)

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.

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### Safety

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

There are no user serviceable parts inside the equipment.

The UCC T3-2 controller is only warranted and approved for use with the provided PSU - Cincon TRG70A240-02E02.

PSU electrical ratings	
Supply voltage	100 V to 240 Vac $\pm$ 10%
Frequency range	50 Hz to 60 Hz
Power consumption	3 A
Output voltage	24 Vdc
Transient voltages	Installation category II

The UCC T3-2 is isolated from the ac power by disconnection of the IEC mains connector from the supplied PSU. If any additional means of isolation is required, it must be specified and fitted by the machine manufacturer or installer of the product. The isolator / disconnection device must be sited within easy reach of the operator and comply with any applicable national wiring regulations for the country of installation.

The UCC T3-2 is provided with an equipotential bonding point which must be used to connect it to the rest of the installation's grounded structures.

**⚠ WARNING:** Switching off or isolating the UCC T3-2 may NOT prevent unexpected machine movement. The user is advised to isolate the machine from the electricity supply, compressed air or other energy sources and ensure the machine is at rest and in accordance with the machine manufacturer's instructions before entering the danger zone or performing any maintenance operations.

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### Environmental conditions

Indoor use	IP30* (BS EN60529:1992)
Altitude	Up to 2000 m
Operating temperature	+5 °C to +50 °C
Storage temperature	-25 °C to +70 °C
Relative humidity	80% maximum (non-condensing) for temperatures up to +31 °C Linear decrease to 50% at +50 °C
Transient voltages	Installation category II
Pollution degree	2

**i** \* **NOTE:** It may be necessary to house UCC T3-2 in a suitable enclosure according to the installation's environmental conditions to obtain a higher IP rating.

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## References and associated documents

It is recommended that the following documentation is referenced when installing the UCC T3-2:

### Renishaw documents

Installation guide: PICS	H-1000-5000
Installation guide: SPA3	H-1000-7566
Installation and user's guide: MCU	H-1000-5182
UCCassist-2 help	Found within UCCassist-2
User's guide: TP200 and SCR200 probe system	H-1000-5014
Installation guide: PI 200-3	H-1000-7542

### External documents

National and international standards including the following may be applicable to the finished machine or installation: -

EN 292-2:1991 (Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications).

EN (IEC) 60204-1:1997 (Safety of machinery - Electrical equipment of machines - Part 1: General requirements).

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## Introduction

The UCC T3-2 is the latest addition to the Renishaw CMM controller product range. It supports the complete range of Renishaw two wire touch-trigger probes along with the high performance TP200 probe.



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Key	Description
1	Machine motors
2	Machine scales and readheads
3	Probe head - manual or fixed - connects to the UCC T3-2 via the machine cabling
4	UCCassist-2 commissioning software and application software
5	UCC T3-2 and power amplifier SPA3 - these connect to the machine cabling
6	MCU joystick - MCUlite-2, MCU5 or MCU W - connects to SPA3
7	PC - connects to UCC T3-2 via an Ethernet cable

The UCC T3-2 is a controller in a 19 inch rack-mountable enclosure. It is coupled to the CMM host computer by an Ethernet link and to the CMM via external cable interface connectors.

The UCC T3-2 controller in conjunction with the SPA3 has the capability of:

- controlling three axes of a CMM (accepting digital readhead signals and generating three axes of motor drive signals)
- accepting input signals from emergency stop, air pressure, crash detector, digital SPA, amplifier faults and all axis inner and outer travel limit switches
- accepting two uncommitted general purpose input signals and generating one uncommitted general purpose output signal
- directly supporting the TP1, TP2, TP6, TP20 and TP200 touch-trigger probes
- providing a +24 V supply for use by the CMM switches
- supporting the MCUlite-2, MCU5 and MCU W joysticks

This guide gives information on physical installation, system connections and communications, as well as assistance in fault finding during the installation of the UCC T3-2.

**⚠ WARNING:** UCC T3-2 is not compatible with PH9, PH10, PHS, PH20 and REVO systems. No attempt should be made to connect these system components to the UCC T3-2 as this will result in damage to the product or attached equipment.

Please use this guide in conjunction with the SPA3 and PICS user's guide in order to fully understand the system's features, capabilities and operation.

The UCC T3-2 **does not** support TP7.

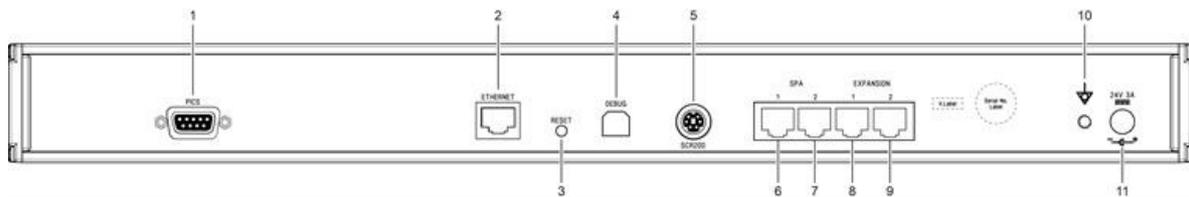
### Front panel layout



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### Rear panel layout



Key	Description	Connector polarity
1	PICS	SOCKET
2	Ethernet communications connector to CMM computer	SOCKET
3	Reset button / IP configure button	
4	Reserved - do not connect	
5	SCR200 rack input (TP200)	SOCKET
6	RJ45 connector to SPA3	SOCKET
7	RJ45 connector to second SPA3 (not implemented at this time)	SOCKET
8	Reserved	
9	Reserved	
10	Equipotential bond point	BOLT
11	DC power jack 24 V	SOCKET

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# Connecting the UCC T3-2 to the host PC

### Hardware connection

The host PC must have a dedicated Ethernet connection to the CMM controller. It is recommended that this is not a USB plug-in adapter because of the reduction in speed these devices can produce.

If the host PC is connected to a network, it is necessary to install additional hardware to allow a dedicated connection for UCC T3-2 communication. For details on how to install additional hardware on the host PC, please refer to the manufacturer user's guide.

The CMM controller is capable of using 1 Gbps Ethernet (with appropriate cable).

A 5 m Ethernet cable is provided for this link as part of the CMM controller kit. The cable included is a Cat 5E, cross-over type. Other lengths may be used, but the maximum length is determined by the generic specification for Ethernet connections.

It is recommended that a shielded Ethernet cable is used if there is a likelihood of EMC disruption due to the environment or location of the routed cable.

It is recommended that the cross-over cable is labelled to avoid being mistaken for a non cross-over cable.

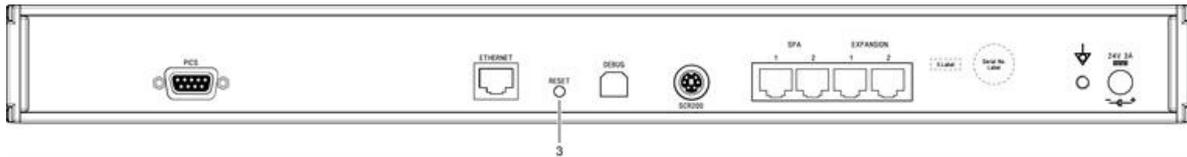
### Software installation

UCCsuite 4.7 service pack 2 (SP2) or newer software must be installed on the host PC prior to connection of the UCC T3-2. The UCC software suite can be downloaded from the [Renishaw website](#). After the software has been installed, run UCCassist-2 to set up and configure the CMM controller.

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### IP configure / reset button



Number 3 on the rear panel is the reset button which has two different functions. The function depends on the operational state of the controller.

1. Pressing and releasing the reset button within fifteen seconds of switching on or rebooting the unit will force the controller into IP configuration state.
2. Pressing and releasing the reset button after the download or whilst operating will cause the unit to restart.

To enter IP configuration state when the unit is already powered, press and release the reset button twice.

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# Installation and connection details

## Dimensions

**Width:** 440 mm (17.3 in)

**Depth:** 180 mm (7.1 in)

**Height:** 44 mm (1.7 in)

**Weight:** 2.1 kg (4 lb 10 oz)

UCC T3 -2 can either be free standing or used in a 19 inch rack system.

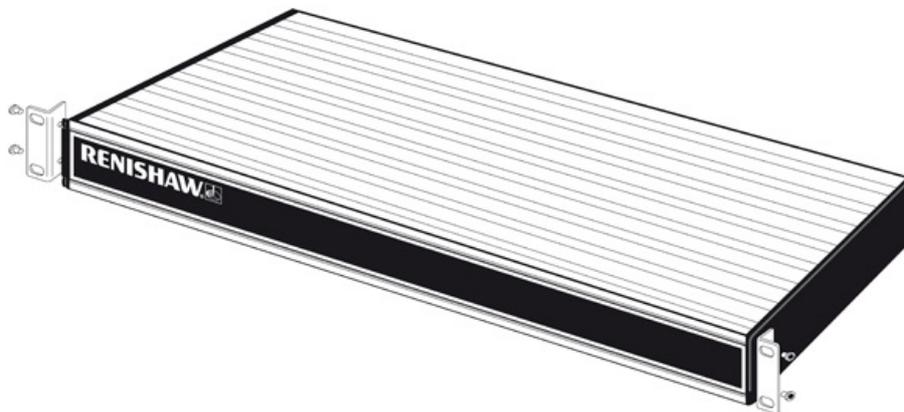
**CAUTION:** Ensure the controller is disconnected from the power supply during installation.

## Stand-alone installation

The CMM controller unit draws air from the right hand side when viewed from the front and expels air out of the left hand side. A minimum clearance gap of 10 mm is necessary between the sides of the unit and any potential obstruction.

## Mounting in a 19 inch rack

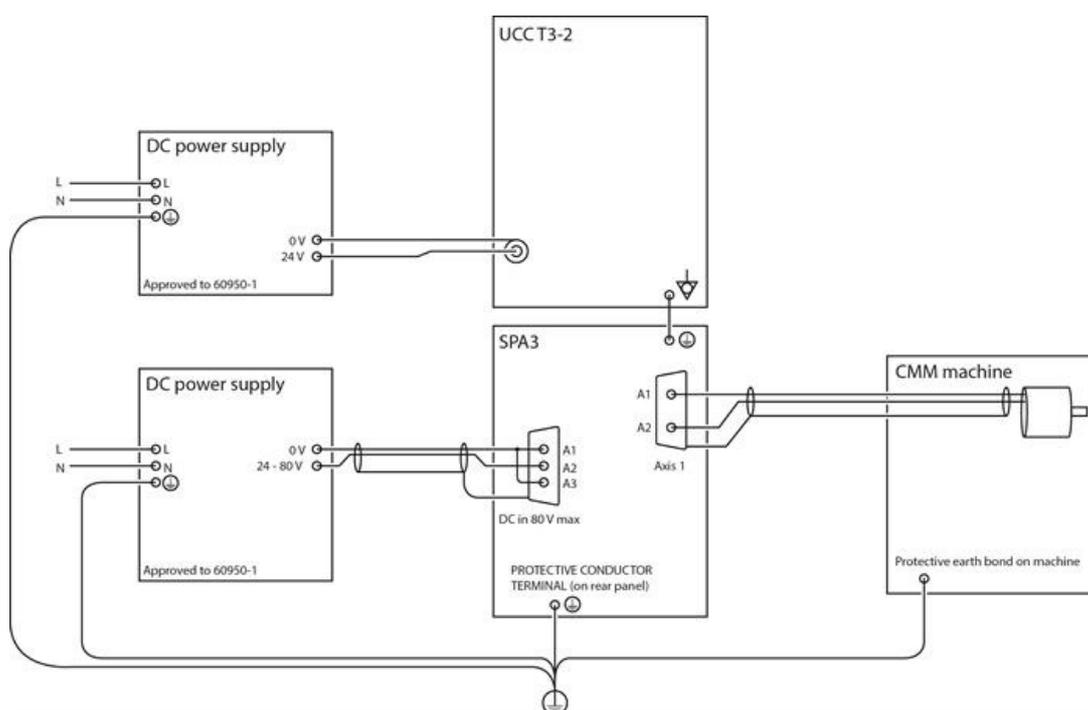
The rack mounting kit (Renishaw part number A-5518-0005) contains two brackets and four M5 × 6 mm screws. Assemble the brackets to the CMM controller as shown below:



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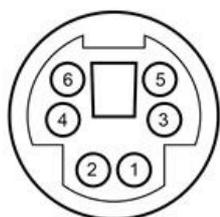
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### Earth connection diagram



### Stylus change rack (SCR) connector

The SCR200 stylus change rack is connected to the controller via a 6 pin miniature DIN socket. The pin numbers are illustrated and their functions are shown in the table.



### SCR200 connector (view on rear panel)

Pin number	Description	Pin number	Description
1	Reset	5	0 V
2	Fault	6	Reserved
3	Inhibit	Shell	Screen
4	+5 V		

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### Cable lengths

#### UCC T3-2 to SPA3 connection

The units must be linked by the supplied shielded CAT 5E 300 mm cable(s), no other cables are to be used.

#### Ethernet cable link to PC

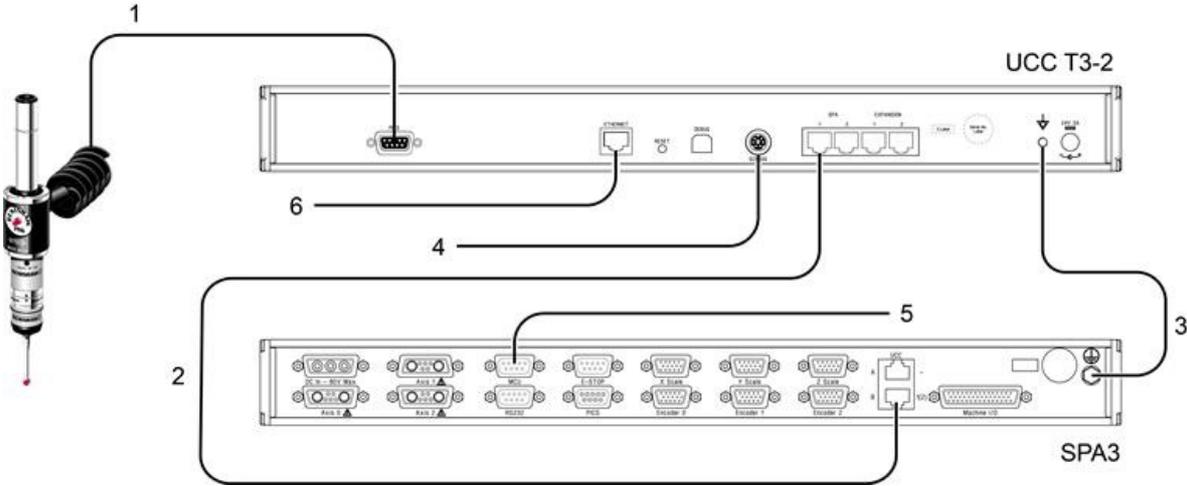
This is a standard Ethernet CAT 5E cable, a 5 m cable is supplied as part of the CMM controller kit. Lengths up to 100 metres can be used.

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## System interconnection diagrams

### Standard two wired touch-trigger probe



Key	Description
1	Head cable(s)
2	Shielded CAT5E cable (supplied)
3	16 / 0.2 mm earth connection
4	SCR200 rack connection
5	MCU connection
6	CAT5E cross-over cable to host PC

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# Troubleshooting

## Front panel LEDs

### UCC T3-2 visual diagnostics



#### Key to LED colour and behaviour:

LED	Description
	LED on
	LED flashing off / on
	LED flashing red / green
	LED off
	LED flashing red / blue

Name	LED colour	Function
STATUS		No LED - no power to UCC T3-2, downloadable unable to start, power cycle and try again
STATUS		Continuous LED - problem with comms link - reboot UCC T3-2 and configure IP
STATUS		Slow flash - waiting for download
STATUS		Continuous light - download successful
STATUS		Fast flash (5 Hz) - IP configuration mode
STATUS		Dual flash - controller booting
STATUS		Internal timeout - reboot UCC T3-2
STATUS		Fast flash (5 Hz) - communications error - reboot required
STATUS		Slow flash - scale error - reboot required
STATUS		Slow flash - problem with download - reboot required (check file type e.g. UCC2)
STATUS		Continuous LED - UCC T3-2 overheated
STATUS		Slow flash - unit does not have controller ID - return to Renishaw
STATUS		Fast flash (5 Hz) - no controller ID in IP configuration mode - return to Renishaw

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**i NOTE:** A scale error will cause the UCC T3-2 to enter an error state which is not recoverable within a metrology application environment. If a scale error occurs it will be necessary to reinitialise the installation due to the possibility of lost scale counts and metrology being effected.

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# Maintenance

**⚠ WARNING:** Maintenance should only be carried out after the machine has been isolated from the electrical supply, compressed air supply or other energy sources in accordance with the machine manufacturer's instructions.

Periodically check that all mounting screws and electrical connectors are securely tightened. Electrical safety checks should include inspecting the mains cable for damage and the safety of the connections. Periodical safety checks should also include the function of the emergency stop system, including operation of all switches integrated into the system.

Remove dust from the external surfaces with a clean dry cloth as the unit is not sealed against liquid.

### Filter replacement

UCC T3-2 uses an internal air flow for cooling purposes. This system has a replaceable filter to minimise the ingress of dust. The condition of the of the filter should be checked on a regular basis. It is recommended that this filter is removed and checked/replaced as necessary or every 12 months.

The following procedure should be followed when replacing the air filter:

- Remove power from the controller
- Remove the 19 inch rack mounting brackets (if fitted) by removing the two fixing screws (not shown)
- Pull the head of both the filter retaining clips away from the unit so they disengage
- Pull away the external filter cover
- Remove the filter material from the filter recess
- Replace the filter using the reverse of the method given above (the replacement filter part number is A-5518-0011)



### Advisory

It is recommended that periodical metrology tests are performed in order to identify any faults in subsystems eg air bearings, structure, cables, software etc.

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