

# Renishaw CMM Products Division

## PRODUCT BULLETIN – PBC1766

<b>Product:</b>	UCC and SPA product family	<b>Status:</b>	Open
<b>Title:</b>	Technical Information for: UCC T3-2, UCC T3 PLUS UCC S3, UCC T5 and SPA3	<b>Date:</b>	28 <sup>th</sup> October 2014

<b>Originator:</b> Dave Joynson		<b>Distribution:</b>
		<b>Internal</b> ✓
		<b>Subsidiaries</b> ✓
<b>Reviewer:</b> Andy Holding		<b>OEMs</b> ✓
		<b>Distributors</b> ✓
		<b>Retrofitters</b> ✓

### Summary:

This bulletin provides information on functionality, specification and global pricing of the new CMM controller products from Renishaw.

- The new UCC T3-2, UCC T3 PLUS, UCC S3, UCC T5, and SPA3 products are detailed, with a comparison to the current solutions. In addition, there is a comparison of the existing and forthcoming MCU joysticks.
- The UCC T3 was launched as UCC Fusion but its name was changed to fall in line with the new naming convention. UCC T3-2 will now replace and obsolete the UCC T3.
- The UCC2-2 will remain to support REVO and SP80 installations. UCC2-2 is also temporarily required to support 4+ axis applications until dual SPA3 functionality is available ( UCCsuite 5.0 spring 2015)
- To simplify the purchasing of a complete controller system there are a number of product related system kits which comprise all items needed for some typical CMM installations.

## **Renishaw's evolving range of CMM controllers, and SPA servo power amp solutions**


### **Renishaw's new UCC controller, and SPA servo power amp solutions...**

Renishaw's UCC2-2 and UCC T3 controllers for DCC CMMs have been available for several years, and in that time they have provided great versatility in both touch-trigger probing and high-speed scanning applications. The SPAlite and SPA2-2 servo power amplifiers have complemented the UCC2 capabilities to meet 3 and 4-axis CMM motion control requirements. These products, coupled with the MCU multi-functional hand control unit, have proved a highly successful solution for both brand new and retrofit machines.

In response to ever increasing market demand for the most effective CMM measurement solutions, Renishaw has introduced an exciting new range of UCC and SPA products designed to precisely fit industry needs. These will provide integrated systems with unrivalled user benefits. Accordingly, UCC T3 and SPAlite have been obsoleted and the new UCC T3-2, UCC T3 PLUS, UCC S3, UCC T5 and SPA3 are being introduced. It is anticipated that these new controllers will heavily substitute sales of UCC2-2 and SPA2-2 products.







Product coverage is key to Renishaw's new approach to making CMMs easier to use and more powerful than ever. The new UCC and SPA3 products provide optimised, high value platforms with excellent functionality to cover every situation from the most basic manual headed DCC CMM with touch-trigger probing (TTP) only, to the most sophisticated DCC machines with highly advanced REVO scanning systems.

The following pages identify the main technical and functional features of the current and new products (listed in ascending capability):




### UCC T3-2 (fixed or manual head machines)

- Built-in touch-trigger probe interfaces (TP20 and TP200)
- Ethernet connection to PC
- Throughput improvement of 40+% compared to UCC T3\*
- Requires SPA3 to interface and power the machine; will not work with SPALite or SPA2-2
- The price of UCC T3-2 and SPA3 is the same as UCC T3
- Utilises an external PSU
- Cannot support PH9/PH10 or TEC
- Requires UCCsuite 4.7.2 or later
- Available NOW - UCC kits #14,#15,#16








Serving the lower-end of the CMM market, UCC T3-2 is a cost-effective compact controller package providing touch-trigger probing only.

\*The processor, combined with Ethernet communications, produces a more responsive system which minimises pauses and delays.



### UCC T3 PLUS (PH10 fitted machines)

- Built-in touch-trigger probe interfaces (TP20 and TP200)
- Ethernet connection to PC
- Built-in PH10 and PH10 PLUS support
- Built-in TEC support (up to 16 sensors)
- Requires SPA3 to interface and power the machine; will not work with SPALite or SPA2-2
- Throughput improvement of 40+% compared to UCC T3 or UCCLite-2 and matches throughput of UCC2-2\*
- Requires UCCsuite 4.7 or later
- Available NOW - UCC kits #6,#7,#8,#9

For the majority of the CMM market, UCC T3 PLUS is a cost-effective compact controller package providing touch-trigger probing and PH10 support.

\*The processor, combined with Ethernet communications, produces a more responsive system which minimises pauses and delays.



### UCC T5 (PH20 systems)

- Unique and powerful 5-axis CMM controller specifically designed for use with PH20
- Built-in TEC interface (up to 16 sensors)
- Ethernet connection to PC
- RS232 interface
- Requires SPA3 to interface and power the machine - will not work with SPAlite or SPA2-2
- Requires UCCsuite 4.7 or later
- Available NOW - UCC kits #3,#4,#5



### UCC S3 (PH10 and scanning machines)

- Built-in touch trigger probe interfaces (TP20 and TP200)
- Built-in SP25 and SP600 support
- Built-in PH10 and PH10 PLUS support
- Ethernet connection to PC
- Built-in TEC support (up to 16 sensors)
- Requires SPA3 to interface and power the machine - will not work with SPAlite or SPA2-2
- Throughput is the same as UCC2-2
- Requires UCCsuite 4.7 or later
- Available NOW - UCC kit #10,#11,#12,#13



UCC S3 and SPA3 are suited to multi-axis CMMs using touch-trigger and/or scanning probes. It is significantly more cost effective than its predecessor UCC2-2, and provides additional functionality and scope for utilising Renishaw's range of productivity enhancing options.



## UCC 2-2

- 4-axis DCC controller
- Built-in touch-trigger probe interfaces (TP20 and TP200)
- Ethernet connection to PC
- Supports - TP7, PH10, PH20, SP25M / SP600, SP80, REVO and TEC (up to 24 sensors) via additional interfaces or cards
- Requires SPAlite, SPA2-2 or SPA3 to power the machine
- Available NOW



UCC2-2 will be used for REVO and SP80 applications. It will also be temporarily used for applications which require more I/O than the SPA3 offers and 4-axis applications.



### SPA3

- 3-axis servo power amplifier
- Utilises an external power supply
- 1 U height
- Output voltage 24 V – 80 V (PSU dependant)
- Output power 800 W (PSU dependant)
- Available NOW

In the coming months it will be possible to use two SPA3 with one controller. This will support up to six machine axes (dual Y, rotary table etc.) and will double the number of I/O available.

In the interim, UCC2-2 will have to be used to control these types of configurations. The multi axis kits listed will have their contents temporarily changed to include UCC2-2 until UCCsuite V5.0 is available.



### SPA2-2

- 3-axis servo power amplifier
- Upgrade option to 4-axis
- 3 U height
- Output voltage 24 V - 60 V
- Input power 600 W
- Available NOW

Will continue to be used for SP80 applications and will be temporarily used for applications which require 4-axis applications.



### SPA2-2 (6-axis)

- 3-axis servo power amplifier
- Powers REVO
- Upgrade option to 7-axis (5 machine + 2 REVO)
- 3 U height
- Output voltage 24 V - 60 V
- Input power 600 W
- Available NOW

Will continue to be used for REVO applications.



### **MCUIite-2**

- Entry level 3-axis joystick
- Available NOW



### **MCU 5**

- Premium 3-axis joystick with display
- Available NOW
- Tap touch available from UCCsuite 4.8



### **MCU W**

- Premium 3-axis joystick with display and wireless connection.
- 30 m non line-of-sight range
- Eight hour battery life
- Handset battery re-charged if placed on the cradle
- Spare battery automatically re-charged in cradle
- Available NOW

The following table contains a comparison of the UCC controllers.

Function / specification	UCC T3-2	UCC T3 PLUS	UCC S3	UCC T5	UCC2-2
Configured for direct CNC controlled (DCC) CMMs	■	■	■	■	■
Processor type	1.6 GHz Intel Atom	1.6 GHz Intel Atom	1.6 GHz Intel Atom	1.6 GHz Intel Atom	1.6 GHz Intel Atom
Number of CMM axes controlled	3	3	3	3	4 (XYZ + 1 additional axis)
Configurable additional axis (rotary table, dual scale, dual drive)	Second SPA3 required *	Second SPA3 required *	Second SPA3 required *	Second SPA3 required *	Further axes by additional cards
Suitable hand control unit	MCUlite-2, MCU5, MCU W	MCUlite-2, MCU5, MCU W	MCUlite-2, MCU5, MCU W	MCUlite-2, MCU5, MCU W	MCUlite-2, MCU5, MCU W
SPA (servo power amp) compatibility	SPA3	SPA3	SPA3	SPA3	SPA3, SPAlite, SPA2-2
Analogue SPA output ±10 V	-	-	-	-	■
Digital SPA control output	■	■	■	■	■
Communications link with PC	Ethernet	Ethernet	Ethernet	Ethernet	Ethernet
PC operating system compatibility	XP pro, Windows 7, Windows 8	XP pro, Windows 7, Windows 8	XP pro, Windows 7, Windows 8	XP pro, Windows 7, Windows 8	XP pro, Windows 7, Windows 8
Servo loop time	0.5 ms	0.5 ms	0.5 ms	0.5 ms	0.5 ms
Touch-trigger probing (TTP) function	■	■	■	■	■
TP200 / SCR200 interface	■	■	■	-	■
SP600 interface	-	-	■	-	■
SP25M interface	-	-	■	-	■
SP80 interface	-	-	-	-	By interface card
PH10 interface	-	■	■	-	By interface card
PH20 interface	-	-	-	■	By interface card
REVO interface	-	-	-	-	By interface card
Temperature sensor inputs	-	16	16	16	24 by interface card
Renishaw UCCserver (I++ DME)	■	■	■	■	■
Common UCC software integration	■	■	■	■	■
Compatible with existing daughter cards	-	-	-	-	■
Maximum real time scanning data rate	-	-	2,000 points/s	-	2,000 points/s
Integral AC power supply	-	-	-	-	■
External DC power supply	■	■	■	■	-
Digital scale input: RS422 - Renishaw	■	■	■	■	■
Analogue scale input	By external interface	By external interface	By external interface	By external interface	By external interface
Uncommitted CMM I/O	2 inputs + 1 output	2 inputs + 1 output	2 inputs + 1 output	2 inputs + 1 output	6 input + 7 outputs
Power available for I/O	24 V at 1 A	24 V at 1 A	24 V at 1 A	24 V at 1 A	24 V at 1 A
I/O specification	User configurable Active HIGH or LOW Voltage range 5 V to 24 V	User configurable Active HIGH or LOW Voltage range 5 V to 24 V	User configurable Active HIGH or LOW Voltage range 5 V to 24 V	User configurable Active HIGH or LOW Voltage range 5 V to 24 V	User configurable Active HIGH or LOW Voltage range 5V to 24V
Outer and inner limit switch compliant	■	■	■	■	■
Soft limit compliant	■	■	■	■	■
CMM volumetric error map function	■	■	■	■	■
Renishaw UCCassist compatible	■	■	■	■	■
<b>Dimensions</b>					
Width	440 mm (19 in enclosure)	440 mm (19 in enclosure)	440 mm (19 in enclosure)	440 mm (19 in enclosure)	435 mm (19 in enclosure)
Height	44 mm (1U)	44 mm (1U)	44 mm (1U)	44 mm (1U)	127 mm (3U)
Depth	180 mm	180 mm	180 mm	180 mm	330 mm
Weight	2.1 kg (4 lb 10 oz)	2.6 kg (5 lb 12 oz)	2.6 kg (5 lb 12 oz)	2.1 kg (4 lb 10 oz)	8 kg (17 lb 10 oz) – without cables and option boards



The following table compares the servo power amplifiers.

	<b>SPAlite</b>	<b>SPA2-2 (3-axis) *</b>	<b>SPA3</b>
UCC controller compatibility	UCC2-2	UCC2-2	UCC2-2, UCC T3-2, UCC T3 PLUS, UCC S3 or UCC T5
Servo amplifier channels	3	3	3
Additional servo amplifier channels	-	1 (UCC2-2 systems only)	-
Total output power	250 W	600 W	960 W max. (PSU dependent)
Maximum continuous power per channel	120 W	300 W (1)	800 W (PSU dependent)
Peak power per channel (dependent on application)	240 W	600 W	960 W (PSU dependent)
Amplifier output (motor) voltage	24 V to 48 V variable	12 V to 60 V variable	12 V to 80 V variable
Amplifier current	0 A to 5 A programmable	0 A to 10 A programmable	0 A to 10 A programmable
E-STOP and contactor circuits included	■	■	-
Emergency stop compatibility	Category 'B' E-STOP	Category '2' E-STOP	Category '2' E-STOP
Tuning method	Digital	Digital	Digital
DC brushed motor compatibility	■	■	■
Tacho motor velocity feedback	■	■	■
Tacholeless velocity feedback	■	■	■
Encoder velocity feedback	■	■	■
AC power supply	Integral	Integral	External
Power supply - input	85 V to 265 V ac, 47 Hz to 63 Hz, 250 W	85 V to 132 V ac, 170 V to 264 V ac, 47 Hz to 63 Hz, 600 W	PSU dependent
Environment - storage	-10 °C to +70 °C (+14 °F to +158 °F)	-10 °C to +70 °C (+14 °F to +158 °F)	-10 °C to +70 °C (+14 °F to +158 °F)
Environment - operation	+10 °C to +50 °C (+50 °F to +122 °F) local to UCC	+10 °C to +50 °C (+50 °F to +122 °F) local to UCC	+5 °C to +50 °C (+41 °F to +122 °F) local to UCC
Dimensions:			
Width	435 mm (19 in enclosure)	435 mm (19 in enclosure)	440 mm (19 in enclosure)
Height	2U (85 mm)	3U (127 mm)	1U (44 mm)
Depth	330 mm	330 mm	180 mm
Weight	5.5 kg (12 lb 2 oz)	9.48 kg (20 lb 14 oz) (maximum - 7-axis system)	2.84 kg (6 lb 4 oz)

The following table compares the joysticks.

	<b>MCUlite-2</b>	<b>MCU5</b>	<b>MCU W</b>
Display window	-	■	■
Fast slow button	■	On paddle	On paddle
Programmable function keys	2	4	4
Axis locks	■	■	■
Engage / re engage	■	■	■
Disable probe	■	■	■
Take point / delete point	■	■	■
Speed override	■	■	■
Operate rotary table	-	■	■
Run/step program	-	■	■
Move in part CS	-	■	■
Soft stop facility	-	■	■
Wireless operation	-	-	■
Battery life	-	-	8 hours
Move in stylus CS	-	Via menu	Via menu
Macro cycles	-	-	-
Orbital mode	-	UCCsuite 4.8 Via menu	UCCsuite 4.8 Via menu
Tap touch	UCCsuite 4.8	UCCsuite 4.8	UCCsuite 4.8

---

**Part numbers:**

---

The new UCC part numbers and kits can be found below.

<b>Product description</b>	<b>Part number</b>	<b>Contents</b>
UCC T3-2	A-5623-0500	UCC T3-2 controller, Ethernet cable, 1 U brackets, 24 V PSU
UCC T3 PLUS	A-5623-0400	UCC T3 PLUS controller, Ethernet cable, 1 U brackets, 24 V PSU
UCC S3	A-5623-0200	UCC S3 controller, scanning licence, Ethernet cable, 1 U brackets, 24 V PSU
UCC T5	A-5623-0100	UCC T5 controller, PH20 licence, Ethernet cable, 1U brackets, 24 V PSU
SPA3 (for use with UCC2)	A-5629-0100	SPA3 power amplifier with several ports blanked off, 1 U brackets, power lead, 44 W connector
SPA3 (for use with UCC T3-2, T3 PLUS, T5, S3)	A-5629-0200	SPA3 power amplifier, 1 U brackets, RJ45 cable, power lead, 44 W connector
48 V - 58 V PSU	A-5518-0025	48 V - 58 V PSU
PH20 controller kit #3	A-5518-1030	UCC T5 controller, SPA3, 48 V - 58 V PSU
PH20 controller kit #4	A-5518-1035	UCC T5 controller, SPA3
PH20 controller kit #5 - 4-axis	A-5518-1037	UCC T5 controller, 2 x SPA3, 2 x 48 V - 58 V PSU
PH10 controller kit #6	A-5518-1060	UCC T3 PLUS controller, SPA3, 48 V - 58 V PSU, MCUlite-2
PH10 controller kit #7	A-5518-1063	UCC T3 PLUS controller, SPA3
PH10 controller kit #8	A-5518-1065	UCC T3 PLUS controller, SPA3, MCUlite-2
PH10 controller kit #9 - 4-axis	A-5518-1067	UCC T3 PLUS controller, 2 x SPA3, 2 x 48 V - 58 V PSU, MCUlite-2
PH10 scanning controller kit #10	A-5518-1070	UCC S3 controller, SPA3, 48 V - 58 V PSU, MCUlite-2
PH10 scanning controller kit #11	A-5518-1073	UCC S3 controller, SPA3
PH10 scanning controller kit #12	A-5518-1075	UCC S3 controller, SPA3, MCUlite-2
PH10 scanning controller kit #13 - 4-axis	A-5518-1077	UCC S3 controller, 2 x SPA3, 2 x 48 V - 58 V PSU, MCUlite-2
Manual head DCC controller kit #14	A-5518-1080	UCC T3-2 controller, SPA3 48 V – 58 V PSU, MCUlite-2
Manual head DCC controller kit #15	A-5518-1083	UCC T3-2 controller, SPA3
Manual head DCC controller kit #16	A-5518-1085	UCC T3-2 controller, SPA3, MCUlite-2
UCC TEC kit #9	A-5518-1600	1 x workpiece sensor, 6-axis sensors, 37 W connector

**Contact your local Renishaw office for pricing**