

Changing an RCU10 unit within an HC20

Overview

This document will guide you through the process of changing an RCU10 unit which has failed within an HC20.

By following the steps in this document you should be able to remove the faulty RCU10 from the HC20, replace it with a new unit and update the configuration.

Initial requirements

A replacement RCU10 unit will be required from Renishaw, these can be ordered using either of the part numbers below, depending on which unit has failed.

- RCU10-PX-XX for a RCU10 which has a pressure sensor fitted.
- RCU10-XX-XX for a standard RCU10 unit.

Axis number	RCU10 unit type
Axis 1	RCU10-PX-XX
Axis 2	RCU10-XX-XX
Axis 3	RCU10-XX-XX
Axis 4	RCU10-XX-XX

Tools required

The following tools are required to complete this operation:

- 1 off - Laptop with the latest version of RCU-CS software installed (*software available from the Renishaw website*)
- 1 off - RCU10 to PC communication cable (A-9904-1456)
- 1 off - Small flat headed screwdriver
- 1 off - 10 mm nut runner

Disconnecting the HC20

Before removing any covers from the HC20 it is essential that the machine is shut down and the laser encoders are turned off. The 24 V power supply located on the HC20 PSU and HC20 compensation unit should be disconnected.

Once the power is removed from the system it is possible to remove the lid of the HC20 compensation unit. This can be done by removing the 6 off screws which secure the lid in place.

Disconnecting the RCU10 unit within the HC20

The HC20 has been designed so that only the faulty RCU10 unit has to be removed. Therefore only the faulty RCU10 unit needs to be disconnected. A description and explanation of each of the cables connected to the RCU10 within the field can be shown in Figure 1.

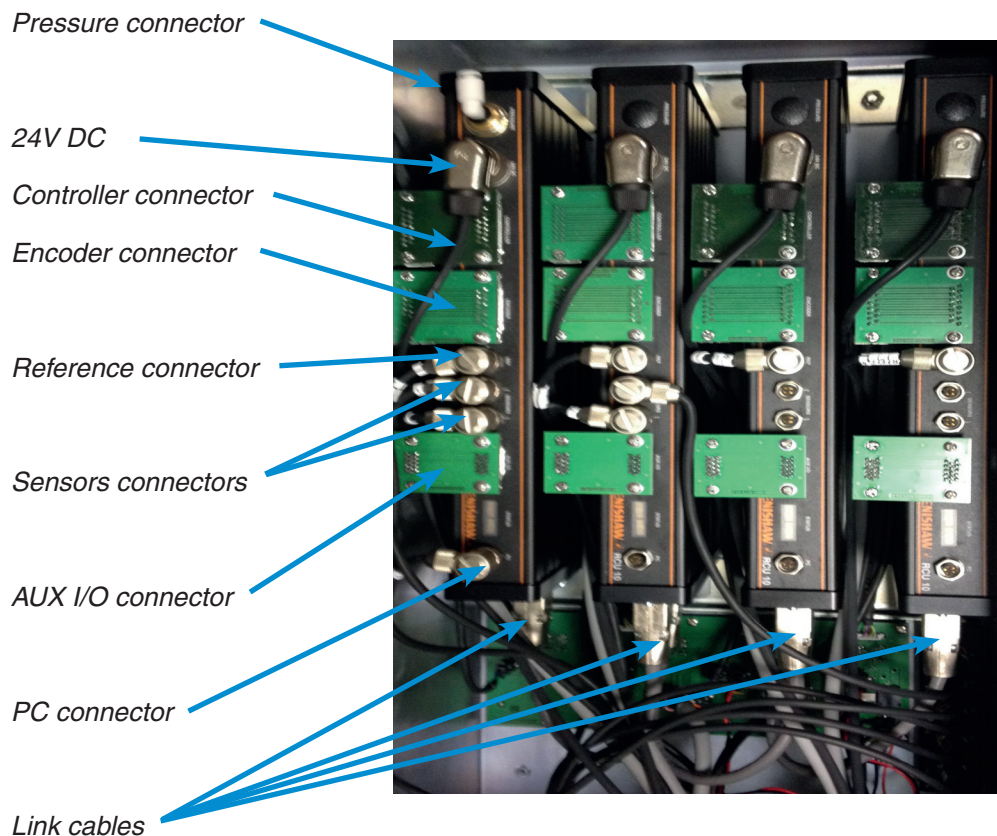


Figure 1: RCU10 cable locations and descriptions

- **Pressure** - If available on the unit, the hose can be removed pressing down on the fitting within the unit and gently pulling on the hose.
- **24V DC** - The supply can be removed by unscrewing the connector.
- **Controller** - The cable will be connected via a link PCB. The PCB can be unscrewed and lifted off the connector. The cable does not need to be removed from the PCB.
- **Encoder** - The cable will be connected via a link PCB. The PCB can just be unscrewed and lifted off the connector. The cable does not need to be removed from the PCB.
- **Ref** - This cable can be removed by unscrewing the connector.
- **Sensors** - If connected these can be removed by unscrewing the connector.
- **AUX I/O** - The cable will be connected via a link PCB. The PCB can be unscrewed and lifted off the connector. The cable does not need to be removed from the PCB.
- **PC** - If connected these can be removed by unscrewing the connector.
- **RCU10 link cable** - A link cable links the RCU10 units together in a network, these will need to be removed from the faulty RCU10 unit using a small flat headed screw driver to unscrew them and discount them from the unit.

Removing the RCU10 unit from the HC20

Once all of the cables have been disconnected from the RCU10 unit, it is possible to remove the two nuts at either end of the unit which are securing it in place.



Replacing the RCU10 unit within the HC20

Use the following steps to replace the RCU10 unit within the HC20:

1. Firstly remove the replacement RCU10 unit from the packing.
2. Fit the two L-brackets to either side of the RCU10 unit using the screws and the allen key provided.
3. Place the RCU10 unit back into the same slot the faulty unit was removed from.
4. Secure the unit in place using the two nuts which were removed as part of removing the faulty RCU10 unit.

Reconnecting the RCU10 unit within the HC20

The cables can now be reconnected in the opposite way to which they were disconnected. All the cables which connect to the RCU10 units should have a cable marker indicating the relevant RCU10. The only two connectors that it is possible to connect incorrectly are the 'REF' and 'Sensors' connectors. The 'REF' cable will be marked with 'REF' and the relevant RCU10 number to prevent this happening.

Do not connect the Link cables at this stage.

Configuring the RCU10 unit

The RCU10 unit will need to be configured before it will function correctly within the network. This has to be completed in a series of stages which are described below.

Allocating the RCU10 within the network

1. Firstly connect the RCU10 to the PC using the communication cable for linking the two units.
2. Power up the RCU10 unit which has been newly added. Ensure that the link cables are not connected prior to the powering up.
3. This will show the RCU10 in 'CONF' mode, connect the RCU-CS software to the RCU10. This is explained with the RCU10 installation guide and user manual. To complete the required changes the user will need to be logged into the RCU-CS software at the 'configuration' level.
4. Once the RCU-CS software has identified the RCU10, the compensation address will need to be set. This can be completed by selecting the 'Configure' drop down menu and then clicking on 'Compensator address'.
5. The compensator address should be set depending on the location of the RCU10 which has been replaced. These are explained in the table below.

Axis number	RCU10 part numbers	Compensator address
Axis 1	RCU10-PX-XX	1
Axis 2	RCU10-XX-XX	2
Axis 3	RCU10-XX-XX	3
Axis 4	RCU10-XX-XX	4

6. Once the compensator address has been programmed ensure that the RCU10 has been left in configuration mode before removing the power.

Converting the RCU10 units into configuration mode

The existing RCU10 units will not recognise the new RCU10 unit until the network has been re-configured. To enable this re-configuration each of the RCU10 units need to be transferred into 'Configuration mode'. This can be done using the following steps:

1. Firstly remove the link cables from each of the RCU10 units.
2. When an RCU10 fails it can leave the units in a strange state. To ensure that units are set correctly, connect each RCU10 to the PC individually and change the unit into 'compensation mode' and then back into 'configuration mode'.
3. Once all of the units have been transferred into configuration mode, ensure that there is no power to any of the units. Then reconnect each of the link cables between each of the units, including the newly installed unit.
4. The RCU10 units should all be powered up together and should be all in 'CONF' mode as shown by the status screens, on each of the units.

Re-setting the network configuration

On re-connecting the HC20 through the COM1 port to the RCU-CS software, the total number of RCU10 units should be detected.

On connecting the RCU10 units, the user may be asked to update the configuration on the new RCU10 with the previous configuration. Select 'Yes' if the you would like this to be completed.

If this option is not available then the configuration will need to be setup manually.

On completing the configuration, the system should then be transferred back into compensation mode before disconnecting the PC.

Once the system is in the correct mode then the lid can be replaced using the original 6 off screws.

System testing and verification

Because the laser scale system is a vital part of the machines operation it is recommended that after the system has been re-connected the system functionality is checked.

It is therefore recommended that the following checks are completed for each laser scale axes and not just those associated with the faulty RCU10 unit.

Verification check	Axis 1	Axis 2	Axis 3	Axis 4
Valid positional feedback				
Output - Beam block 'Error'				
Output - Laser pre-heat 'Error'				
Output - Beam low 'Warning'				
Output - Awaiting reference 'Suspend'				
Input - Seek reference				
Input - Reset				
Input - Workpiece comp enable				
Input - Workpiece comp temp freeze				

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