

RCU-06

USER MANUAL



Introduction

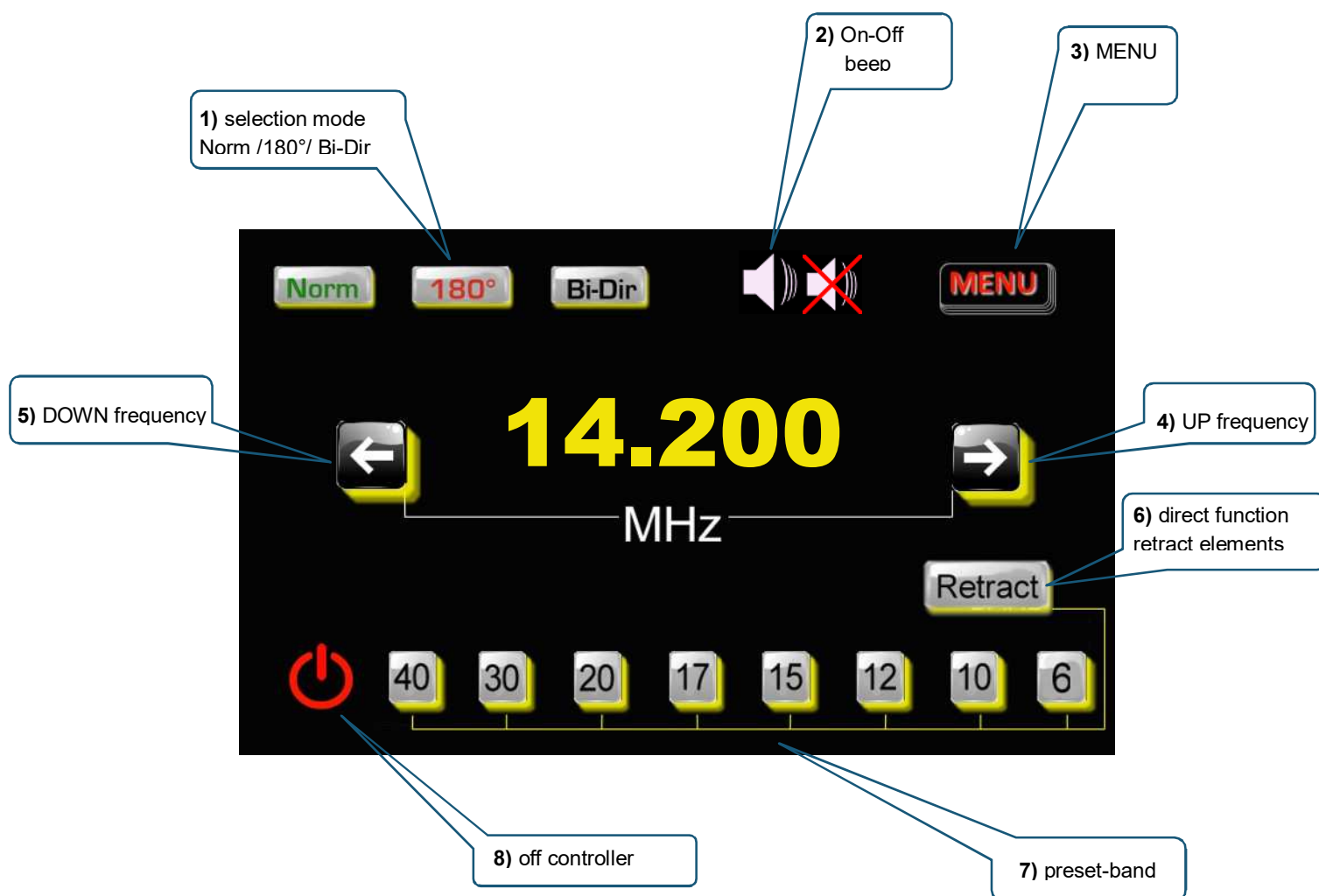
The following manual will show the features and how to use the antenna electronic controller, easy and intuitively to be used. The new RCU-06 has all the features of the old controller, but thanks to a new software and hardware, the capabilities and general features had been improved.

Before installation and use of the antenna, UltraBeam recommends a careful and thorough reading of the manual.

The new RCU-06 can be used and is 100% compatible with all models of antennas.



MAIN DISPLAY PAGE TOUCH COMMAND



The main display provides all information about the antenna status and contains all the main useful touch commands for antenna manual management and its functions.

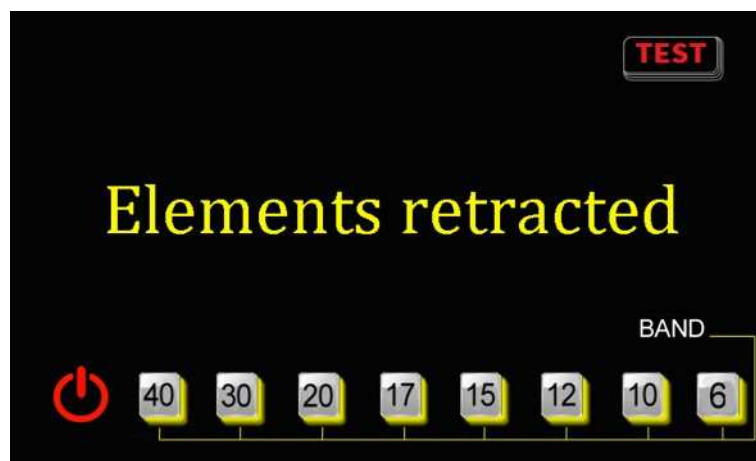
- 1) Three commands to select the electronic antenna pointing Normal - Reverse - Bi-Directional
 - 2) Command to enable or disable the beep during movement of the elements
 - 3) Control to access the menu.
 - 4-5) Modify the operating frequency up or down in steps of 100-50-25 kHz, depending on the band.
 - 6) Allows direct retraction of the elements without accessing the menu.
 - 7) The antenna is initialized to move directly to the desired band
 - 8) Turn off the controller, to turn it on, touch the screen
- Some commands will not be used if the controller is connected to the radio for frequency control.

FIRST START TEST AND PRE-ASSEMBLY

At first power on the controller is present in the "Elements Retracted"

Before starting the antenna assembly, UltraBeam always advises to perform a general test in order to ensure that all received parts have not been damaged during transport, this will avoid unpleasant surprises during installation.

The test will allow you to check the Controller - Wiring - Motor unit in a few minutes

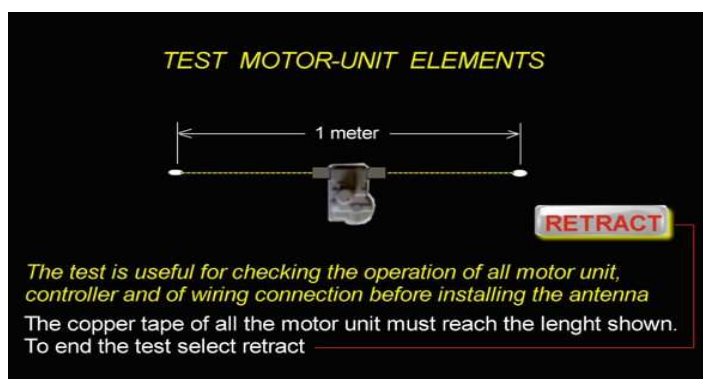


- 1) Place the motor unit in a line on the floor or on a table
- 2) Connect the wiring to the motor unit and the controller, the DB25 should be locked in any case with the screws.
- 3) Power up the controller with the supplied 24V switching power supply
- 4) Press TEST
- 5) If everything is ok the copper tape will come out of the motor unit with a total length of 1 meter
- 6) Press the RETRACT command to retract the tape

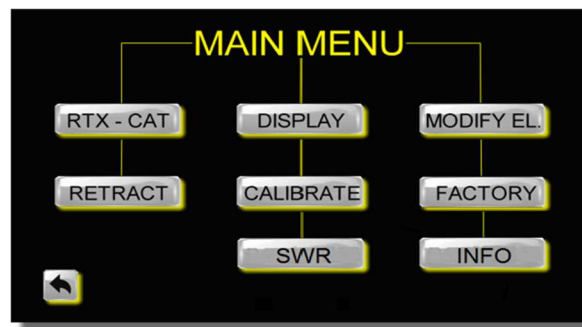
During the TEST the display will still show the instructions just described

If the test result is positive you can install the antenna

For an installed antenna it is always recommended a final test before it is raised. In this case you need to select any band to verify if the ribbon moves correctly inside all elements.



If instead of pressing the command "Test" it is pressed one of the band preset, the tape will exit a length equal to approximately half the wavelength of the selected band, this does not cause any particular problem and for the purpose of test the result would be the same but the greater length of copper output from the motor unit may be excessive for the space available to the test, and the risk of bending the tape would be greater, for this reason the test function was created.



All menu functions are shown in a single page to provide a clear and immediate reading.

The display will automatically show *for the most important functions* a quick start guide that teaches about the specific techniques of the selected function, this will avoid wrong and / or inappropriate manoeuvres.

The menu pages will automatically close after 60" if no selection or modification has been made and the display will automatically return to the main page.

RTX - CAT

The controller can change the frequency and band completely automatically if connected to the radio (see radios supported - Page 7).

The function allows you to select the radio protocol in use.

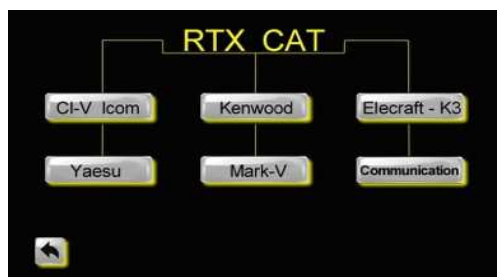
The current radio protocols are not specific for the model but by brand *.

Each manufacturer has its own specific protocol, then simply select the brand of your radio.

In order for the controller to communicate with the radio you need to use appropriate cables that have a proper pin-out (Pag.9)

Note: The selection of protocols is required only when you connect the radio to the serial- DATA-IN, if you are using the dedicated "Icom CI-V" input, it is not necessary to select the protocol, the radio will communicate automatically.

We recommend that you first set up and test the connection with 9600 bd. If everything works fine, you can switch to higher baud rates.



COMMUNICATION

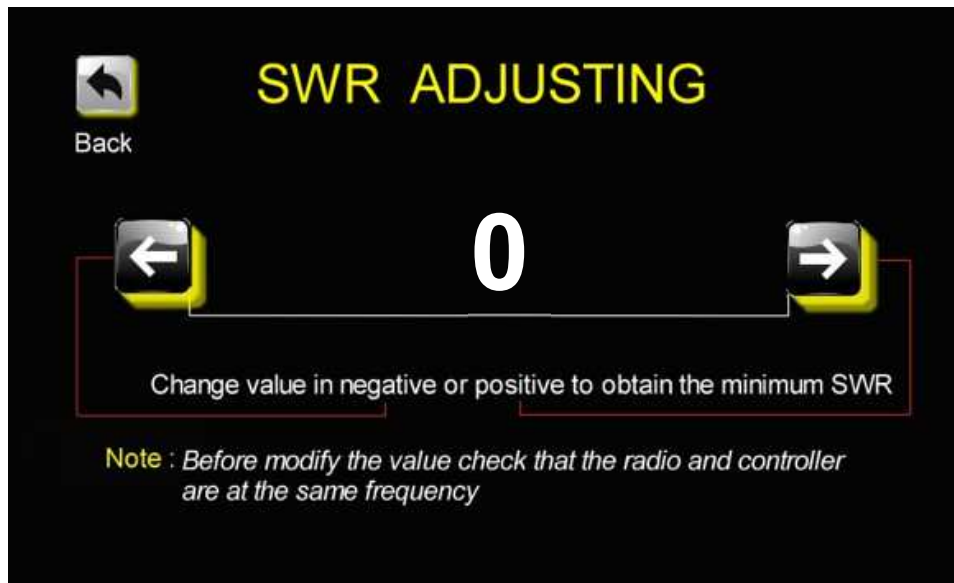
When a protocol is selected all parameters are set correctly in automatic mode, you will only need to check your radio that CAT function is enabled and that the baud rate is identical to that set in the controller as shown in this window, you will not have to change or set any parameters.

If the radio does not communicate with the controller it is possible that there is a problem in the cable or error in the radio menu.

However, if for any reasons of your system set-up you require to change the speed or other parameters set by the controller, you will be able to do it from the communication function, this feature is only recommended for OM experts.

Note: if you have made changes to the parameters from the Communication menu, later you should not to re-select it otherwise the controller will automatically reset the protocol parameters to default.

So first select your protocol and then change values in "communication".



SWR ADJUSTING

This new feature allows you to quickly adjust the minimum SWR where necessary.

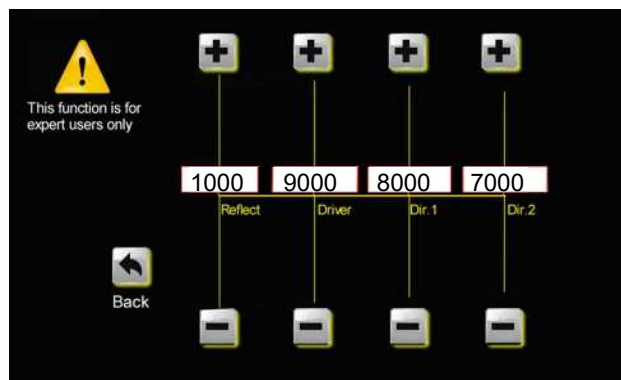
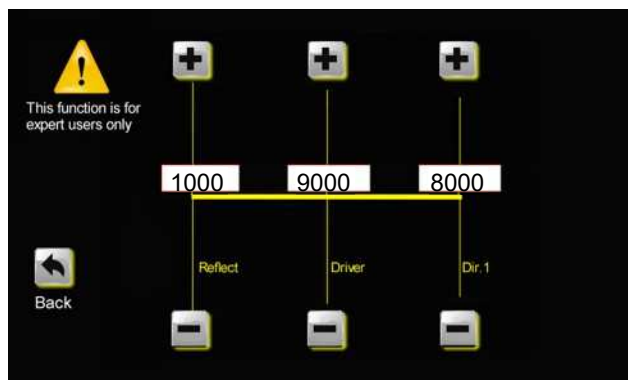
Although the default action of the elements already allows the antenna to resonate on all bands, it is possible that because of the inevitable variables that each installation presents (height, length and type of coaxial, disturbing objects etc.) you might see a discrepancy between the actual resonant frequency and the one indicated by the controller.

So just as you would with a dipole where you will lengthen or shorten the two ends so that it can resonate at the desired frequency, even in this case (if necessary) is possible to correct the length of the elements to move the resonance point, so if for example the antenna resonates higher than the frequency indicated by the controller, this means it is short so you will increase the value, vice versa if lower you will decrease. This must be done on all bands and in three different pointing ways Norm/180° / Bi-Dir Select a band and put radio and controller at the same frequency (normally band in center) for example 20 meter, 14.200 Mhz, 7,100 meters on 40 etc. etc.

Select the "SWR ADJUSTING" function

Bring the radio in transmission (RTTY) and check your SWR, if necessary correct the value indicated by the display (-100 / + 100) until the minimum value exit from the menu is reached.

After having completed this procedure, when you will change frequency within the band in which the calibration is completed, the controller will adjust automatically the length of the elements so that the antenna retains its resonance. This usually will result into a value of 1.1 SWR on all bands, only because of insufficient height, disturbing objects or other factors such value could be higher, in which case you can intervene by adjusting elements with the procedure already described in the "standard" manual controller.



MODIFY ELEMENTS

This function shows the total length of every single element of your antenna in mm.

For dual driver antenna models it is possible that the function displays only the elements in the band in use, however this does not apply to all models and is at the discretion of UltraBeam.

When a change is made in the MAIN DISPLAY it will show "CUSTOM" only in the band and mode where the change was made, selecting the "Factory Default" menu will restore the factory initialization and the CUSTOM wording will disappear.

Warning: Adjusting the measures determined by the manufacturer without an adequate competence may negatively influence the antenna performance, so although it is possible to freely change all lengths, the use of this function is recommended only for experienced users.

Note: When you have activated the 180 ° pointing the measures of reflector and director are reversed (though not identical) so if the 180 ° pointing is inserted, if you change the reflector actually you change the director and vice versa.

CALIBRATION

This function should be used only in the rare cases in which one or more motor units lost step.

The accidental loss of step can be caused by several factors, including the most common:

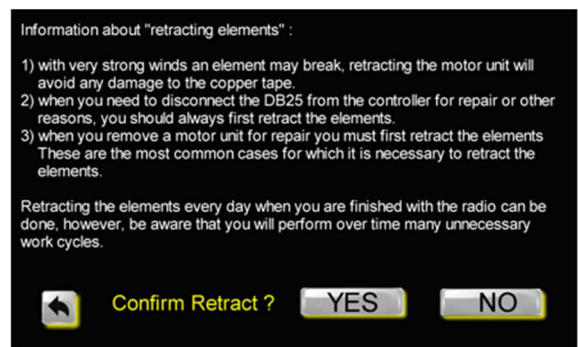
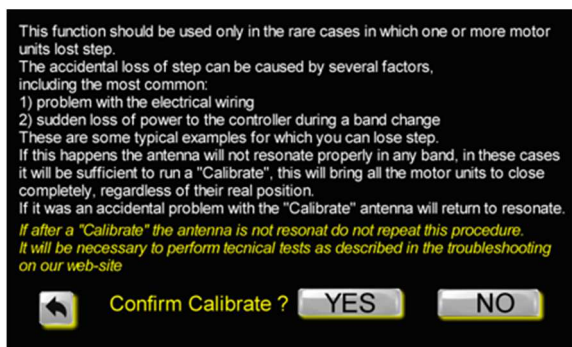
- 1) problem with the electrical wiring (poor electrical contact between the controller and motor)
- 2) sudden loss of power to the controller during a band change
- 3) increased friction in the sliding of the copper tape
- 4) poor contact of the DB25 to the controller or a motor unit connector
- 5) controller supply problem (low voltage)

These are some typical examples for which you can lose step, the condition in which obviously the antenna will not resonate properly in any band, in these cases it will be sufficient to run "Calibration", this will bring all the motor units to close completely, regardless of their actual position.

If it was an accidental problem simply select any band and the antenna will return to resonate.

Otherwise, if after calibration the antenna continues to not resonate, it will be mandatory do visually and technically inspect the antenna as described in "Troubleshooting UltraBeam", in order to find out the reasons of failure.

http://www.ultrabeam.it/site/index.php?option=com_phocadownload&view=category&id=5&Itemid=55&lang=en



ELEMENTS HOMING (RETRACT)

Such function exists as inherent in the antenna, whose motor drives must necessarily be retracted for shipping and for the installation.

Having said that this function is not considered to be essential whenever you turn off the radio station, the controller can be switched off, leaving the antenna on last used frequency just as you do with the radio.

The next time you turn on the antenna it will be ready to be used on the same frequency in which it was left at power-off. However, this function cannot and should not be used in cases where there are extreme weather conditions (strong wind). In these cases, retracting the elements can prevent the tape from bending, in which, in rare cases, an element might get broken.

In any case, you are free to retract the elements every time you want.

To retract the elements, select MENU> Retract> Yes.

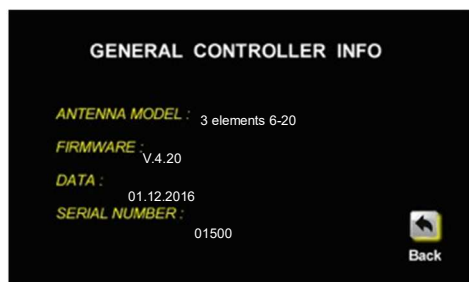


DISPLAY SETTING

Adjust the brightness of the display

GENERAL CONTROLLER INFO

Shows all controller information



- Software antenna model
- Firmware
- Dates of manufacturing and testing
- Serial number

DATA-IN CAT RADIO

RCU-06 has ports for communication with several radio protocols. This unit allows different setups: One for the 3.5 mm-Jack dedicated to all ICOM radio. The other for RS232 dedicated to CAT Yaesu, Kenwood, FlexRadio, Elecraft and many others using the same protocols.

AMPLIFIER

SECOND CONTROLLER

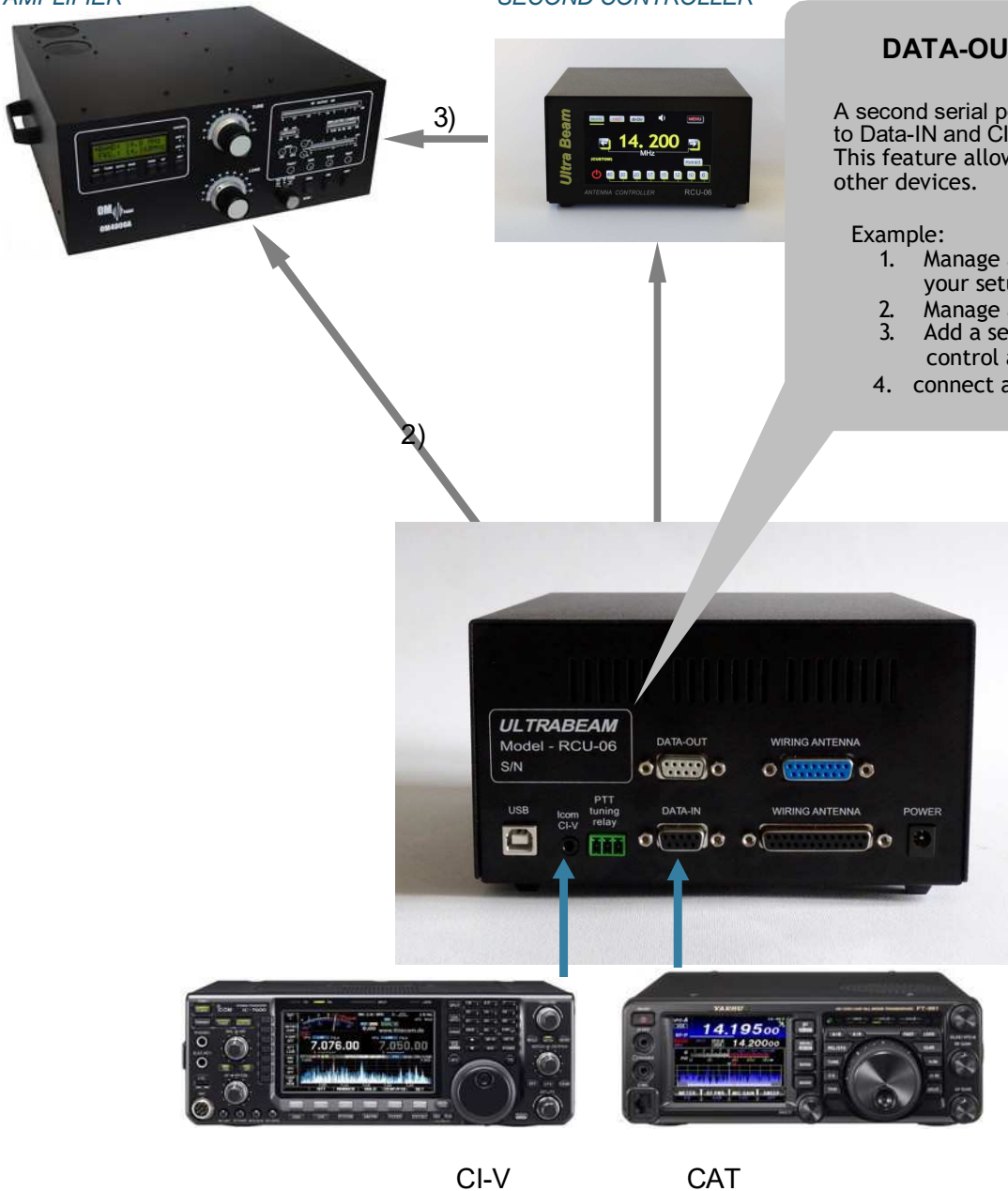
DATA-OUT

A second serial port replicate the radio protocol send to Data-IN and CI-V.

This feature allows the use of a second controller or other devices.

Example:

1. Manage a second UltraBeam controller, if your setup has two UltraBeam antennas.
2. Manage a Linear Amplifier
3. Add a second controller and from this control a Linear Amplifier
4. connect a PC with logging software



CI-V

CAT

ICOM RADIO

YAESU-KEWOOD-FLEXRADIO-K3

It is possible to connect both data-in CI-V and DATA-IN, but only one will be active at the same time. This feature allows to connect two radios without changing cable.

For radio connected by serial on Data In it is necessary to select the appropriate protocol "RTX-CAT" The radio link with Icom CI-V is automatic and there is no need of any setup, be sure to utilize the 9600-baud rate.

Note: Check the right pin-out as shown on page 9. •

When using the DATA IN interface, 'RTS' in the CAT menu of the transceiver must be switched off because the pin in the controller is not used. Otherwise, no connection is made.

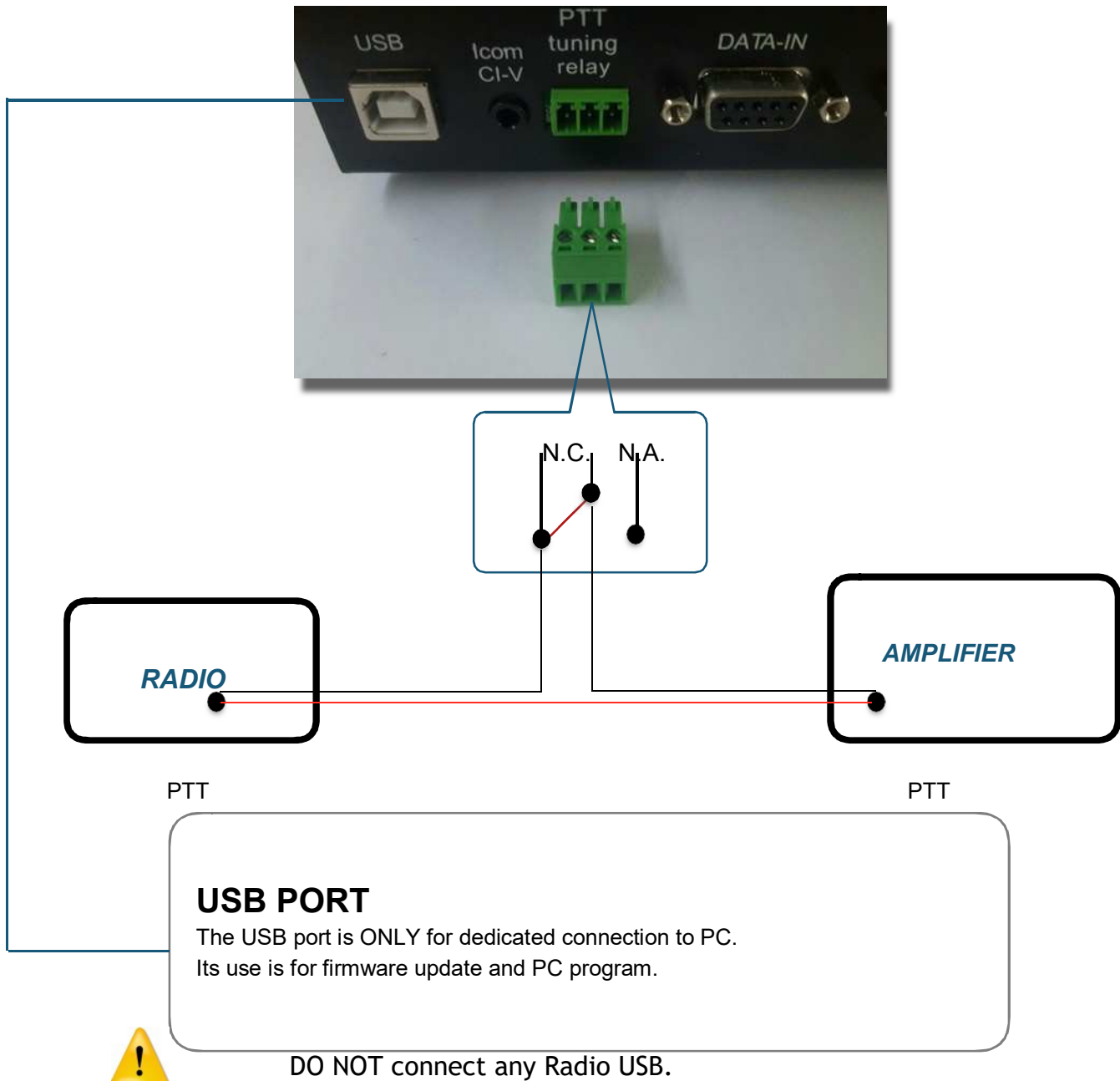
When a PC with logbook program is connected to DATA OUT, frequency information obtained via CIV or DATA IN is automatically transferred there.

RELAIS PTT

The controller offers an acoustic and visual aid during the moving of elements. We, for extra measure, add a switch to raise the protection of an erroneous transmission during tuning. During band change an integrated relais let you inhibit transmission of an external amplifier. An external connector let you wire easily the PTT cable of your amplifier, the internal relais can manage 1A, more than sufficient for normal operation.

NC (normally closed) with stopped elements

NA open with stopped elements



CAT RADIO WIRING

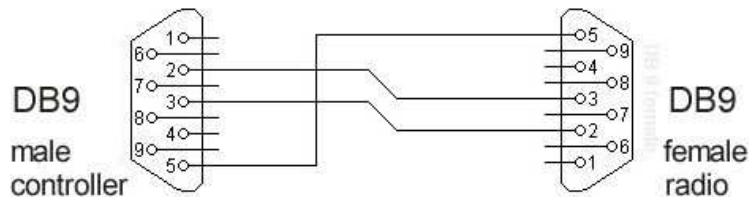
ICOM

The common Icom cable jack 3.5 male/male Mono/Stereo can be used.



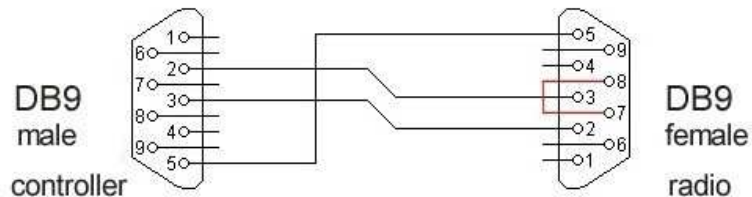
YAESU - K3 - FLEX

The following sketch is for all Yaesu Radio and can be used also for K3 and Flex, etc. For more info take a look into your Radio Manual to be sure of pin-out.



KENWOOD

The Kenwood use a similar pin-out with a jumper between 7 and 8 pin.

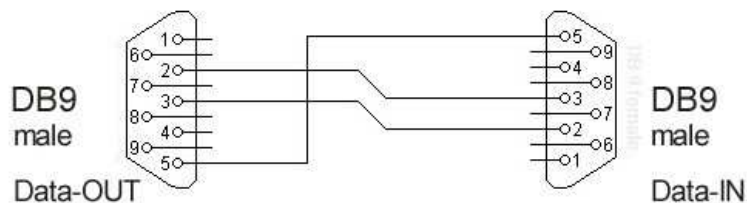


DATA-OUT / DATA-IN

This cable is used to connect two UltraBeam controllers.

It uses the Yaesu pin-out but with a Male/male connector.

You can connect the first controller ("master") to the Data-In of a second one ("slave"), you can connect also old models.



Note:

The routing of Data-Out will be delivered to the second controller independent of the radio connection on Data-IN or CI-V

You can use this data routing for other devices like amplifier, etc. Please refer to appliance documentation.

“WIRING” = CONTROL CABLE



Rev. 1.10

The electrical control wiring is a simple component but at the same time among the most important of the entire antenna system.

It requires suitable features for a good transfer of the electrical signal to the stepper motors as well as appropriate quality in order to resist weather-depending influences, such as atmospheric agents to which the antenna is normally subject.

Since 2010, UltraBeam builds Plug and Play Fully factory assembled electrical wiring, so just plug the wiring to the controller and the motor drive and your antenna is ready for use.

This solution reduces to ZERO the possibility of errors in the electrical connections between the controller and the antenna motor units, which happened in the past with home made wiring.

Furthermore, the factory-assembled wiring is devoid of electrical contact points usually present at the intersection of the downward multipolar cable and the individual motor cables, this avoids any bad contact ensuring a smooth function for long time.

The harnesses are made with high quality multi-core cables and are produced specifically on UltraBeam specifications, the connectors used are the excellent IP68 made by Switchcraft with gold plated contacts.



NOTE: Standard length of all wirings is 30m, however they can be built of specific length as specified by customer order.

Note: The length of the wiring is meant from the controller DB25 to the "Y" cable splice. The motor cables should not be considered in overall length.

The technical and mechanical characteristics of UltraBeam motor units enable proper operation of the antenna even with very long cablings up to 200-300 meters.



Details of the main wiring harness factory assembled by UltraBeam

The motor units of the antennas ordered with electrical wiring will be assembled with female multipolar connectors for instant plug and play, simply attach the cables to the boom and the cast.

NOTE: In cases where it is necessary to pass the cable through electrical conduits or holes in the wall it will be enough to remove the DB25 and pass the cable from the outside to the inside and resolder as before.