

METROPWR RT1 User Manual



Installation and operation

The RT1 digital controller operates a Yaesu DC antenna rotator using the touchscreen, front-panel controls or a computer. This guide covers installation, the Windows application, LAN networking, wiring and calibration. Complete local checks and calibration before using remote control.

Screenshots in this edition refer to firmware 1.02. Menus may vary with firmware and application versions.

1 Safety Information

- Use RT1 indoors in a dry, ventilated area. Keep liquids away and do not obstruct ventilation openings.
- Disconnect power before changing cables. Follow the supply voltage and polarity marked on the unit. Internal repairs must be performed by qualified personnel.
- Check end stops, cable clearance and the full antenna travel. Keep people and obstacles clear of the moving antenna. Supervise calibration and initial tests.
- Keep a physical means of disconnecting motor power readily accessible. Turning off the display does not remove power. See page 15 for interrupting AUTO CAL.
- Stop RF transmission before changing an antenna switch selection.

CE information. Contact METROPWR for the applicable EU Declaration of Conformity and compliance information.

Disposal. The crossed-out wheeled-bin symbol indicates separate collection of electrical and electronic equipment. Take RT1 to an authorised collection facility; do not dispose of it with household waste (EU WEEE Directive 2012/19/EU).

CE, regulations and disposal CE – References: EMC 2014/30/EU; RoHS 2011/65/EU as amended by (EU) 2015/863. Do not dispose of with household waste, take to an authorized collection point. Manufacturer: Metropwr di Ferrulli Antonio & C. – Via Cap. Locorriere 32, 70025 Grumo Appula (Italy)

*** The manufacturer reserves the right to update technical information in this manual without prior notice.**



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2 Introduction and Compatible Rotators

METROPWR RT1 is a controller for DC-motor rotators with potentiometer position feedback. Its 7-inch capacitive touchscreen displays actual and selected headings. Operate it using touch commands, the encoder, manual CW/CCW buttons, seven heading presets or PARK.

Yaesu Model	Connection
G800DXA	Use the approved cable or adapter for the exact model.
G1000DXA	Use the approved cable or adapter for the exact model.
G2800DXA	Use the approved cable or adapter for the exact model.

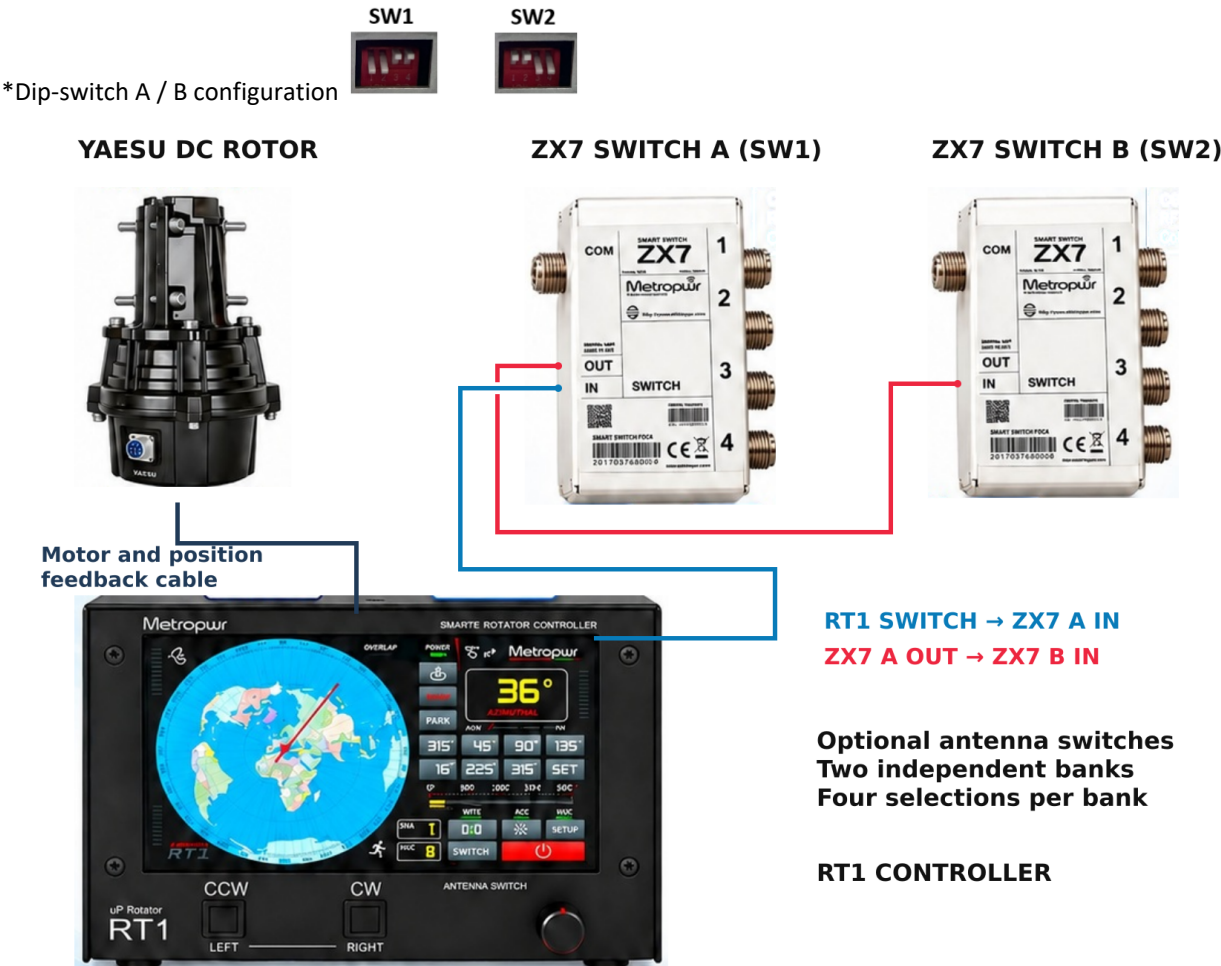


Figure 1 RT1 with a Yaesu rotator and two optional ZX7 antenna switches

Getting Started

1. With power disconnected, connect the approved rotator cable, the required power supply and any USB, LAN or ZX7 control cables.
2. Power on RT1 and wake the display by touching it or pressing the encoder. Test short CW and CCW movements and verify that rotation stops.
3. Calibrate both travel limits, set the antenna offset and test short movements before enabling computer control.

3 Windows Application and Network Setup

The official METROPWR Windows application provides a compass or map, real-time azimuth, positioning, stored headings, STOP and manual CW/CCW control. Install the RT1 package supplied by METROPWR and connect via Ethernet LAN or USB serial.

APP UFFICIALE METROPWR INCLUSA

Interfaccia RT1 | Motori DC | Controllo locale e remoto



Rotori Yaesu DC: G800DXA, G1000DXA, G2800DXA e G-450DC

Figure 2 Official METROPWR application with the main functions highlighted

Using the Application

1. Open **CONFIG**, choose the connection and select **YAESU**. Save settings and enable the connection.
2. Check that the azimuth updates. Test a short move in each direction and verify **STOP** during normal positioning.
3. Use the dial, configured preset buttons or manual controls. **MAPS** switches the display view.

Preset labels in the app may be independent of RT1 presets. The app's ON and OFF commands may control the connection and do not guarantee that motor power is disconnected.

Application Connection Settings

Open CONFIG in the Windows app. The example uses LAN address 192.168.0.7 and control port 7121. If your unit uses different settings, enter its current IP address. For initial setup, the computer and RT1 must be on the same local subnet.

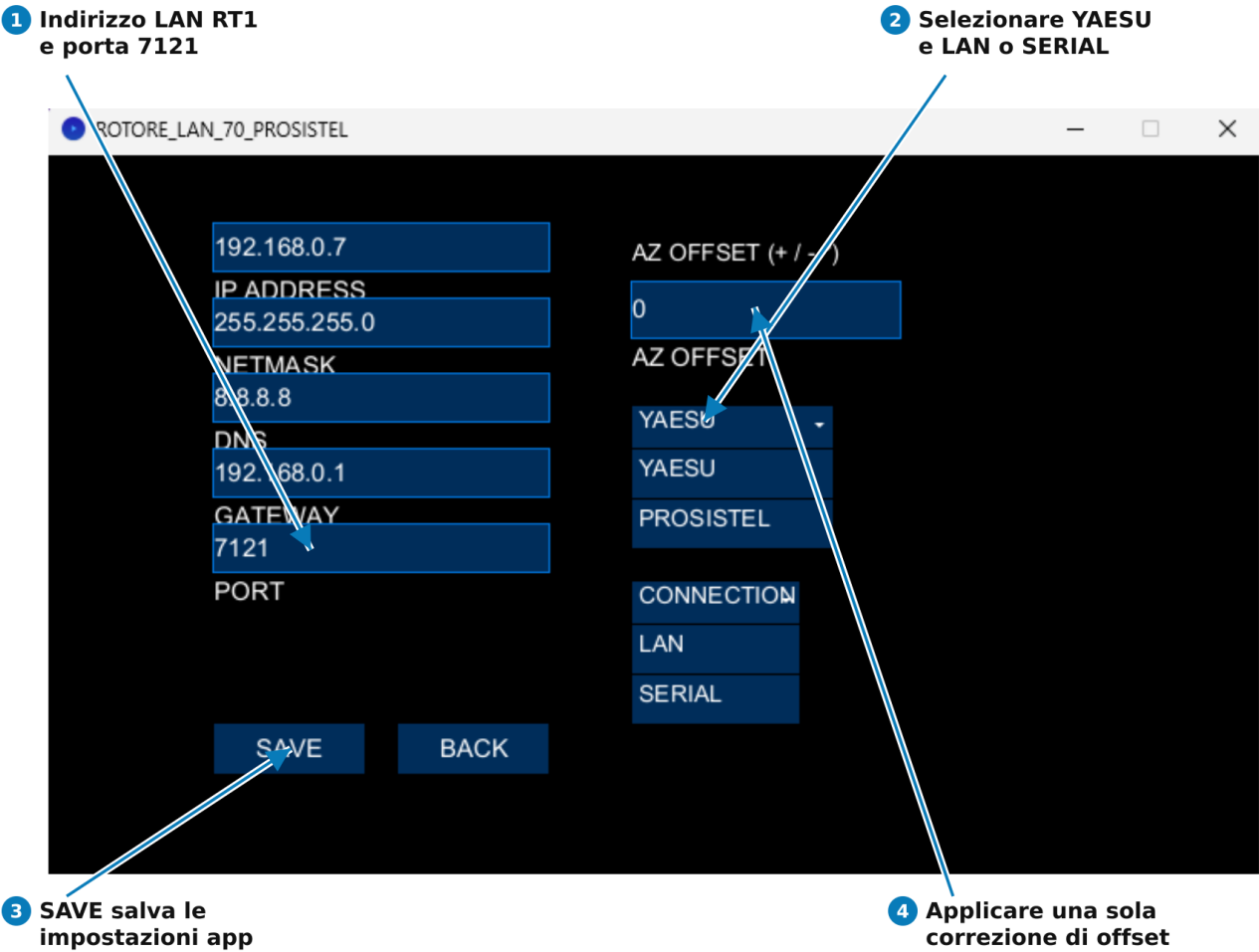


Figure 3 Example Windows application configuration

Field	Example or Required Setting
IP Address	192.168.0.7 Use the IP address assigned to your RT1.
PORT	7121 Must match Local Port Number in the LAN module.
Rotator and Connection	YAESU and LAN for Ethernet, or SERIAL for USB.
AZ OFFSET	0 in this example. Apply any offset correction only once.

LAN. Configure the Ethernet module as shown on the following pages. Enter the same IP, port and network values in the app, then press SAVE. Select USB/LAN in RT1 ROTOR SETUP.

USB serial. Use a USB-C data cable. Select the assigned COM port and 9600 baud, 8 data bits, no parity and 1 stop bit. Install the supplied driver if needed. Close any other apps using that COM port.

LAN Address and Serial Connection

Connect the RT1 LAN port to your router. From the same subnet, open <http://192.168.0.7> or the module's current address. The example login is admin / admin. Configure the values shown and press Save on each page. Use Local Port Number 7121 for control.

1 Scegliere un IP libero sulla LAN

2 Allineare sottorete e gateway del router

3 Salvare le impostazioni di rete

Figure 4 Local IP Config: choose an unused address on your network

1 9600 baud 8 N 1

2 Porta di controllo locale 7121

3 TCP Server modalità operativa

4 SAVE salva le impostazioni

Figure 5 Serial Port: 9600 baud, 8 N 1, TCP Server on port 7121

LAN Module Management and Restart

Misc Config identifies the module and manages web access and simultaneous TCP clients. Record new credentials before saving them. Four clients are configured in this example; the available limit depends on the installed module.

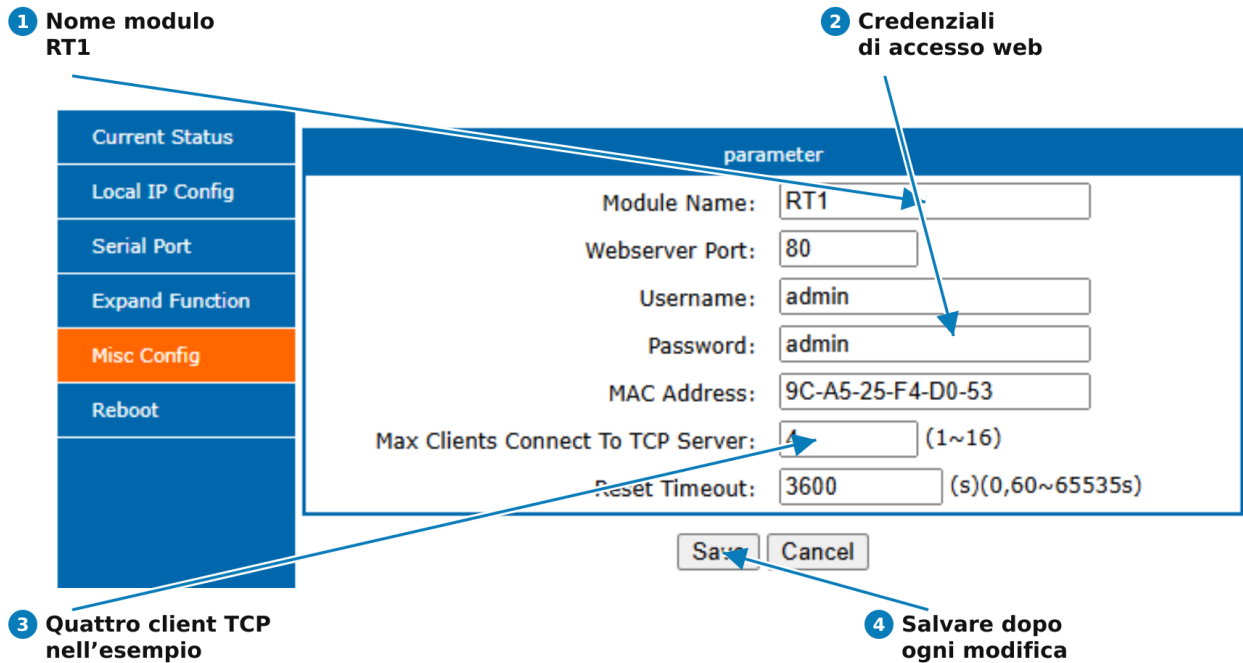


Figure 6 Module name, web credentials and client limit

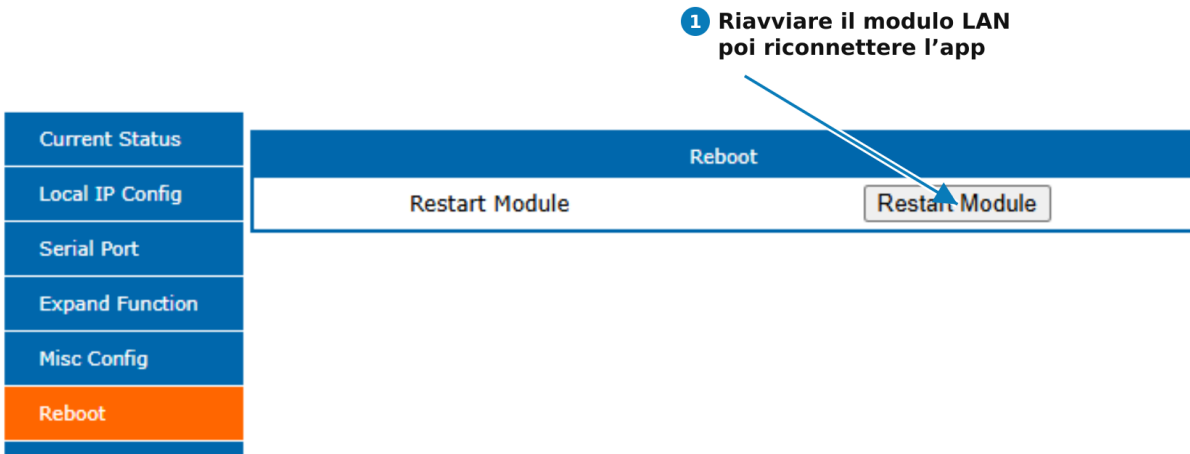


Figure 7 Restart Module restarts the network module

1. Save network and serial changes. If required, select Reboot and press Restart Module.
2. Wait for the LAN module to restart, then reopen its page using the saved IP address.
3. Set RT1 to USB/LAN, reconnect the Windows app and test a short movement over the local network.

A LAN restart closes active connections. It is separate from the controller's DEFAULT and FORMAT commands and does not calibrate the rotator. When several clients are connected, coordinate who controls the antenna: a new target replaces the previous one.

4 Rear Connections and Yaesu Adapters

Disconnect power before wiring. In the illustrated rear view, pins are numbered from left to right. SWITCH is the ZX7 control bus; connect Ethernet to the LAN socket.

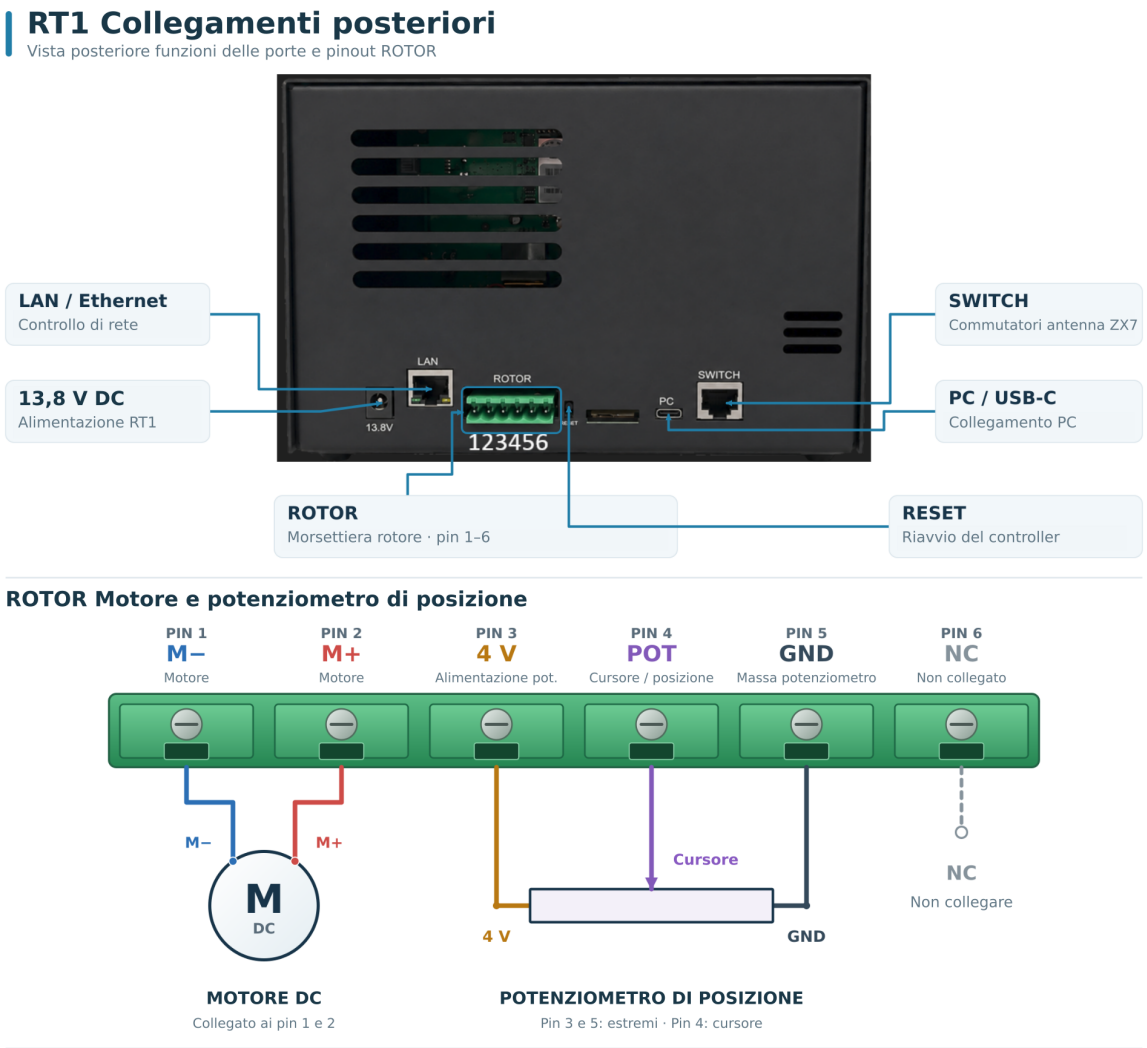


Figure 8 Rear panel, motor wiring and position potentiometer connections

Pin RT1	Signal	Function
1	M-	DC motor connection
2	M+	DC motor connection
3	4 V	Position potentiometer supply
4	POT	Position potentiometer wiper
5	GND	Position potentiometer reference
6	NC	Not connected Leave unused

Use the 13.8 V DC input and follow the polarity and power requirements marked on the unit. USB-C connects the PC and does not replace the motor supply. RESET restarts the controller.

Yaesu Connector Adapter

This adapter connects the six-contact Yaesu connector to RT1’s green KF2EDG terminal block. View the connector from the contact side with the latch at the top. The numbers identify the contact positions in the photograph.

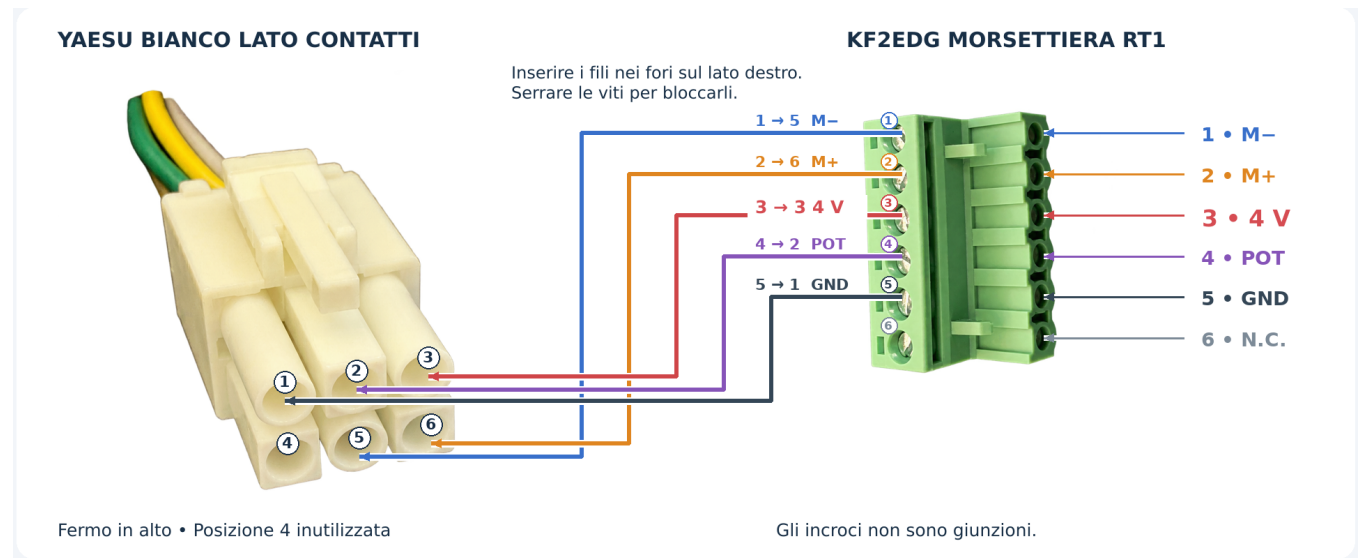


Figure 9 Contact positions and wiring of the white Yaesu connector

Pin RT1	Yaesu Connector Position	Signal	Function
1	5	M-	Motor connection
2	6	M+	Motor connection
3	3	4 V	Potentiometer supply
4	2	POT	Position wiper
5	1	GND	Potentiometer reference
6	Unused	NC	Leave unconnected

Assembling and Checking the Adapter

1. Disconnect the Yaesu cable from its original controller. Identify contacts using the illustrated view and verify that the cable is approved for the rotator model.
2. Insert each stripped conductor into the correct opening of the green terminal block and tighten the screw. Leave position 4 of the white connector and RT1 pin 6 unused.
3. Insulate exposed conductors and provide strain relief. With both ends disconnected, check continuity and absence of shorts before applying power.
4. Connect the adapter, test short CW and CCW movements, then calibrate both end positions.

Wire colors in the diagram identify signals; they do not specify the colors of the Yaesu cable conductors. Crossing lines without a junction dot are not electrically connected.

Round Yaesu Connector Adapter

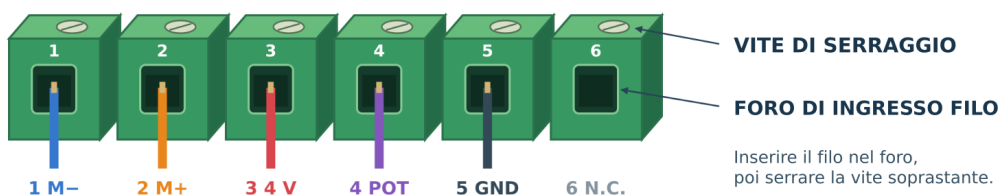
The Yaesu connector (rotator end) is **shown from the pin side**, with the large key at the top. The contact-side view is mirrored. Identify the numbered contacts before soldering.

METROPWR | RT1

COLLEGAMENTI → CONNETTORE YAESU ROTONDO A 7 PIN

1. MORSETTIERA VERDE KF2EDG A 6 POSIZIONI

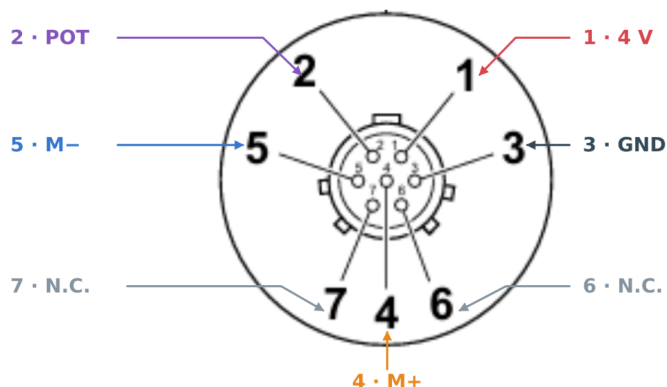
Lato ingresso fili · Morsetti RT1 da 1 a 6 da sinistra a destra



Il morsetto 6 resta inutilizzato. Inserire i fili nei fori, non sulle teste delle viti.

2. IDENTIFICARE I CONTATTI DEL CONNETTORE YAESU ORIGINALE

Disegno originale dei contatti Yaesu



VISTA LATO SALDATURE

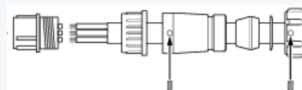
Guardare il lato in cui i fili vengono saldati.

Tenere la chiave grande in alto.

I pin 6 e 7 sono inutilizzati
in questo cavo RT1.

La vista lato contatti è speculare.

CORPO CONNETTORE YAESU ORIGINALE



3. COLLEGARE UN FILO ALLA VOLTA

MORSETTO RT1	PIN YAESU	FUNZIONE
1 M-	5	Motore M-
2 M+	4	Motore M+
3 4 V	1	Alimentazione potenziometro
4 POT	2	Cursore / segnale di posizione
5 GND	3	Massa potenziometro
6 N.C.	—	Non collegato

Vista contatti Yaesu: disegno originale fornito · Colori dei fili indicativi.
Identificare il pin 1 e rispettare il lato di vista indicato prima di collegare.

Figure 10 Original round Yaesu connector and RT1 connection table

Follow the numbered terminals and check continuity of the completed cable. Round connector contacts 6 and 7 are unused in this RT1 adapter and must be insulated. Do not apply the white connector position numbers to this connector.

5 Operation, Calibration and PSTrotator

The red pointer shows the measured heading; the yellow pointer indicates the target. North is 0°, east 90°, south 180° and west 270°. Wake the display before using the controls.



Figure 11 Main screen showing target, status, presets and settings

Selecting a Heading and Stopping

- Touch the desired heading on the compass or map to start positioning.
- Turn the encoder to select the target. Movement starts after a short delay. Pressing the encoder wakes the display; it does not confirm the target or stop the motor.
- Hold the physical CW or CCW button for manual rotation. Release it to stop movement.
- Touch a preset or PARK to recall the saved heading. Press STOP on the touchscreen to interrupt normal positioning.

The numerical display may briefly show the target before returning to the measured heading after about three seconds. The motor power indicator displays the applied command, not measured mechanical speed. Normal positioning has a 60-second timeout.

Combined Control Screen

The combined view brings together heading, motor power, PARK, STOP, presets and both ZX7 groups. It uses the same saved rotator settings as the main compass view.

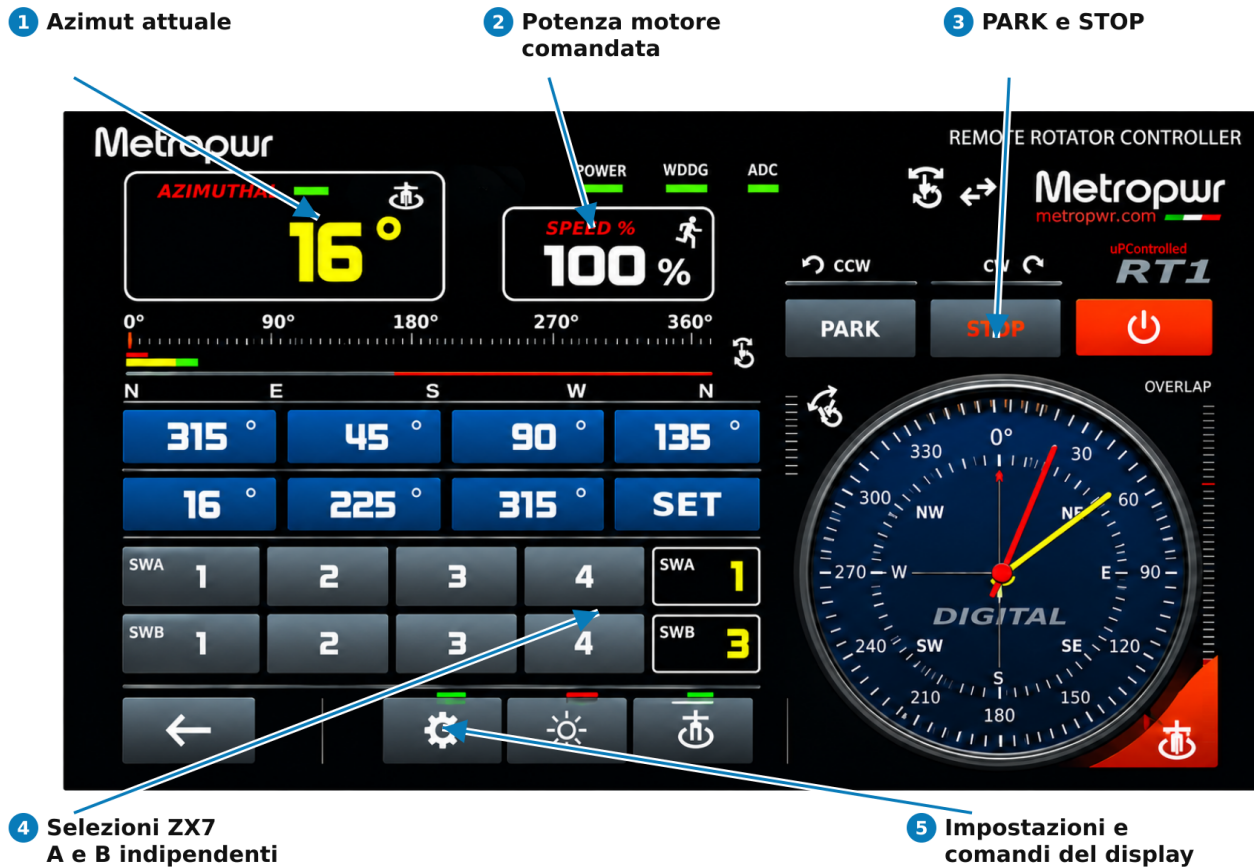


Figure 12 Alternative screen with rotator and antenna-switch controls

Saving Preset Headings and PARK

1. Open SET and enter headings from 0° to 359° for the seven presets and the separate PARK position.
2. Use the displayed save command or SET to store the values and return to normal operation. Saving a heading does not start movement.
3. Recall the desired positions and verify the antenna's actual heading after stopping.

PARK commands an antenna position. It does not switch off RT1 or detect wind. A new target from local controls or a connected app replaces the previous target.

Position and Travel

The display wraps from 359° to 0°. Mechanical travel continues through the OVERLAP area beyond 360°, up to 450°. With zero offset, the CW end stop at 450° appears as 90°; the same displayed heading can therefore correspond to two mechanical positions.

Map Display and Antenna Offset

1 Toccare la mappa per scegliere l'obiettivo

2 Azimut attuale in gradi

3 Modalità display e luminosità

4 SWITCH apre la pagina ZX7

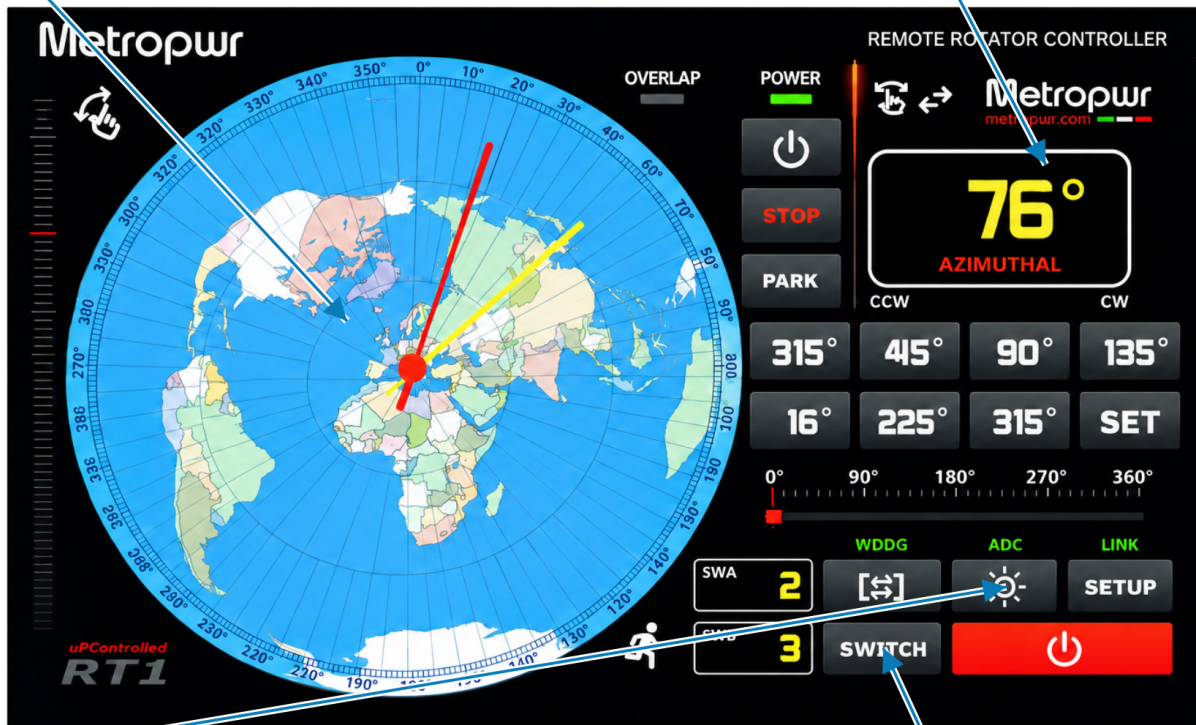


Figure 13 Map view with the same positioning and switching functions

Display Preferences

The brightness control cycles through four levels. SLEEP TIME sets the inactivity delay; ALWAYS keeps the display on during use. BEEP enables or disables touch sounds.

Firmware 1.02 starts with the display backlight off. Touch the screen or press the encoder to wake it, and wait before selecting a command. The screen power icon controls only the backlight: RT1 remains active and can receive remote targets.

Antenna Heading Correction

1. Calibrate the rotator with antenna offset set to 0°. Point the antenna toward a known geographic direction and compare it with RT1.
2. Set and save a correction from -180° to +180°. For example, if RT1 displays 180° when the antenna points north, use -180°.
3. Check at least two other headings, presets and PARK. Avoid applying the same offset again in the Windows app or PSTrotator.

The offset changes the heading reference, not mechanical travel. AUTO CAL resets the offset; restore any required correction after calibration.

Optional ZX7 Antenna Switches

RT1 independently controls two optional ZX7 switches. Open SWITCH and select position 1 through 4 for SWITCH A and SWITCH B. SWA and SWB on the main screen show the commanded selections.

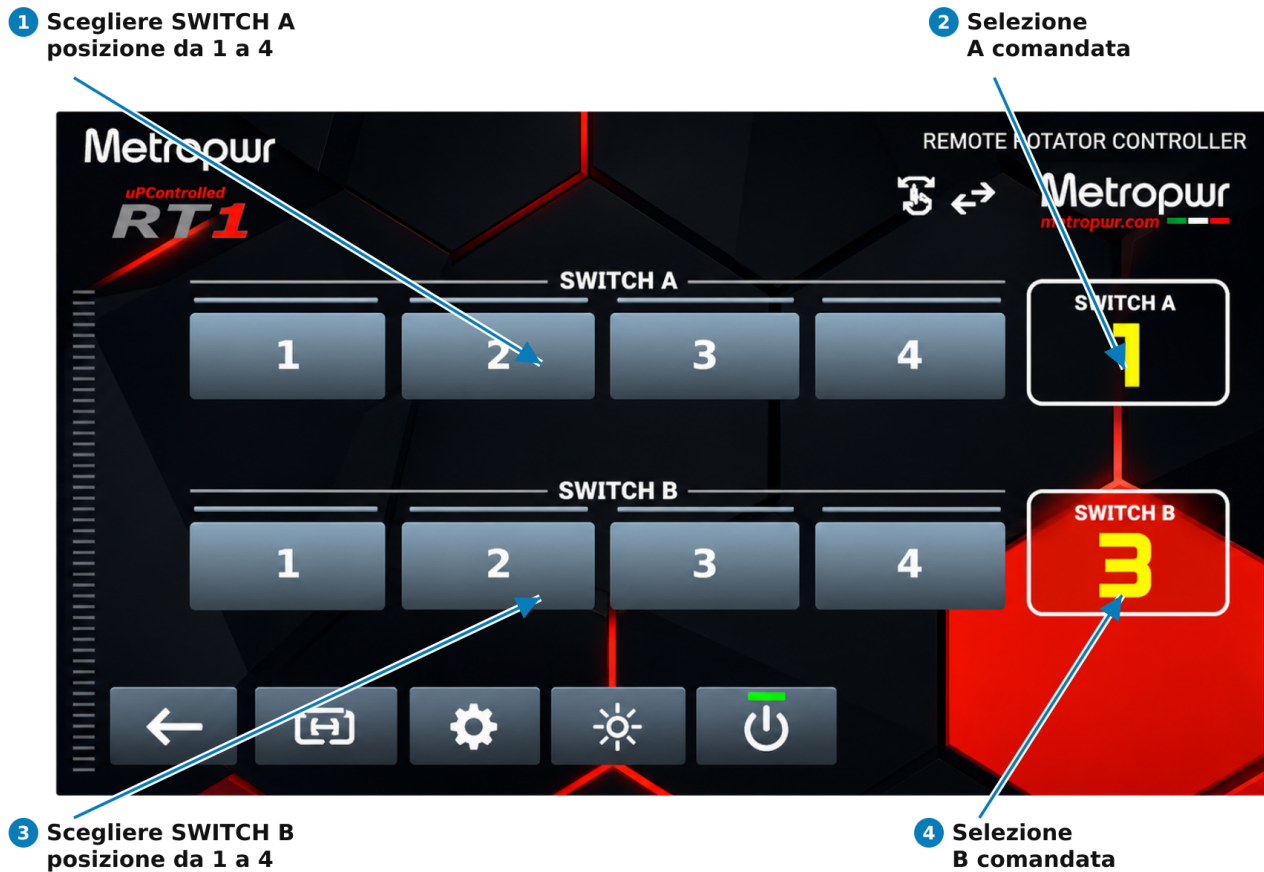


Figure 14 Independent ZX7 A and ZX7 B selections

1. Connect the dedicated bus from RT1 SWITCH to ZX7 A IN; with a second switch, connect ZX7 A OUT to ZX7 B IN.
2. Stop RF transmission. Select A and B positions and verify the actual RF path before resuming transmission.
3. Verify that the correct antenna corresponds to each stored selection.

Selections are saved independently; initial values are A1 and B1. RT1 displays the command sent to each switch. It does not electrically verify relay position or automatically inhibit transmission.

Keep the ZX7 control bus separate from Ethernet. Follow the ZX7 instructions for RF installation and electrical limits.

Manual Rotator Calibration

Manual calibration stores the two actual mechanical limits: fully CCW at 0° and fully CW at 450°. Check wiring, end stops and cable clearance. Reset offset to zero and close remote-control apps before starting.

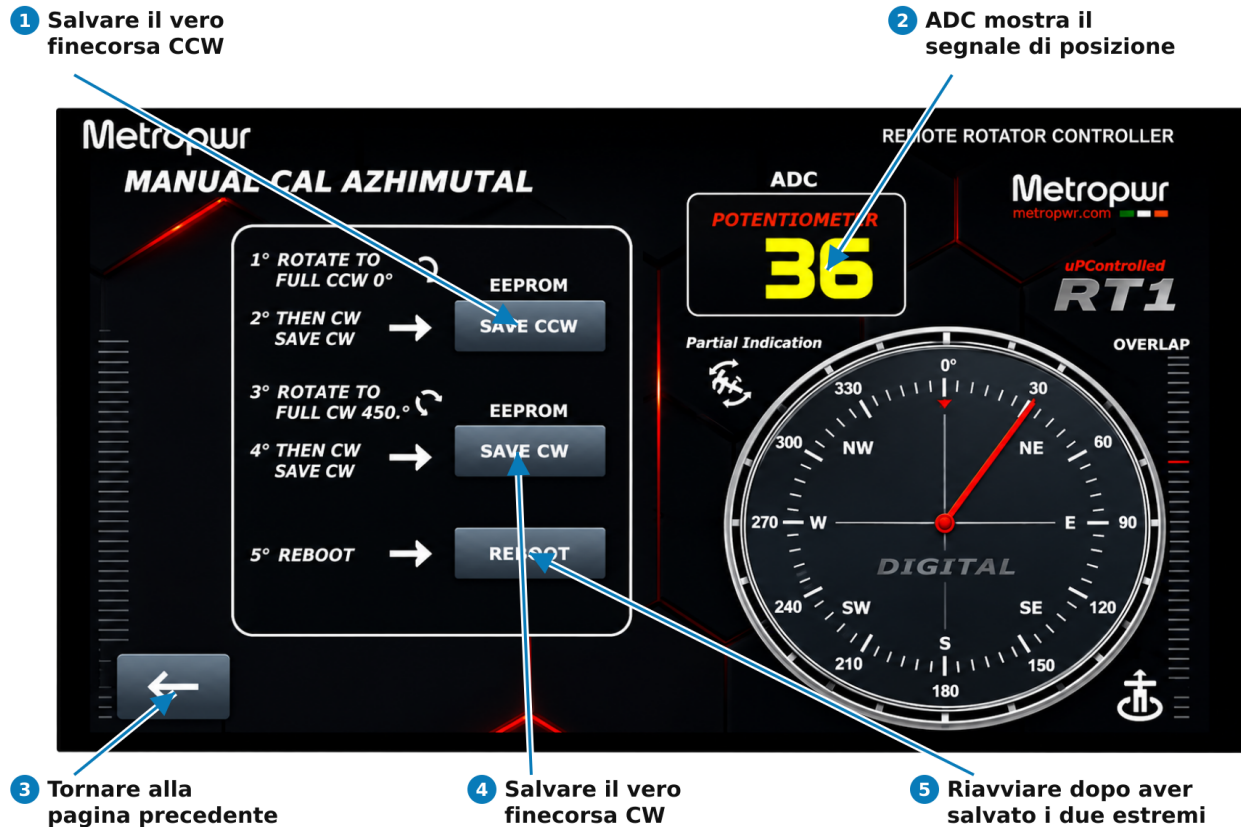


Figure 15 Saving both mechanical limits in the manual calibration menu

1. Open ROTOR SETUP and select MANUAL in the CAL AZIMUTHAL section.
 2. Hold the physical CCW button until the actual CCW end stop is reached. Release the button and wait for the reading to settle.
 3. Press SAVE CCW. Wait for any automatic restart, wake the display and reopen MANUAL if necessary.
 4. Hold CW until the actual CW end stop, including the overlap travel up to 450°. Release and wait for the reading to settle.
 5. Press SAVE CW. Wait for the restart and use REBOOT if requested on screen.
 6. Wake RT1 and check short movements, both limits, intermediate headings and north crossing. Restore the required antenna offset.
- CW reference. With zero offset, the physical end stop at 450° reads 90°. Do not save the first 90° position as the CW limit. Repeat calibration after changing the rotator, changing position wiring or resetting settings.

Automatic Calibration and Rotator Settings

Use AUTO only for supported travel from 0° to 450°, with functioning hardware end stops. Supervise the entire sequence, keep the antenna area clear and keep a physical motor-power disconnect accessible.

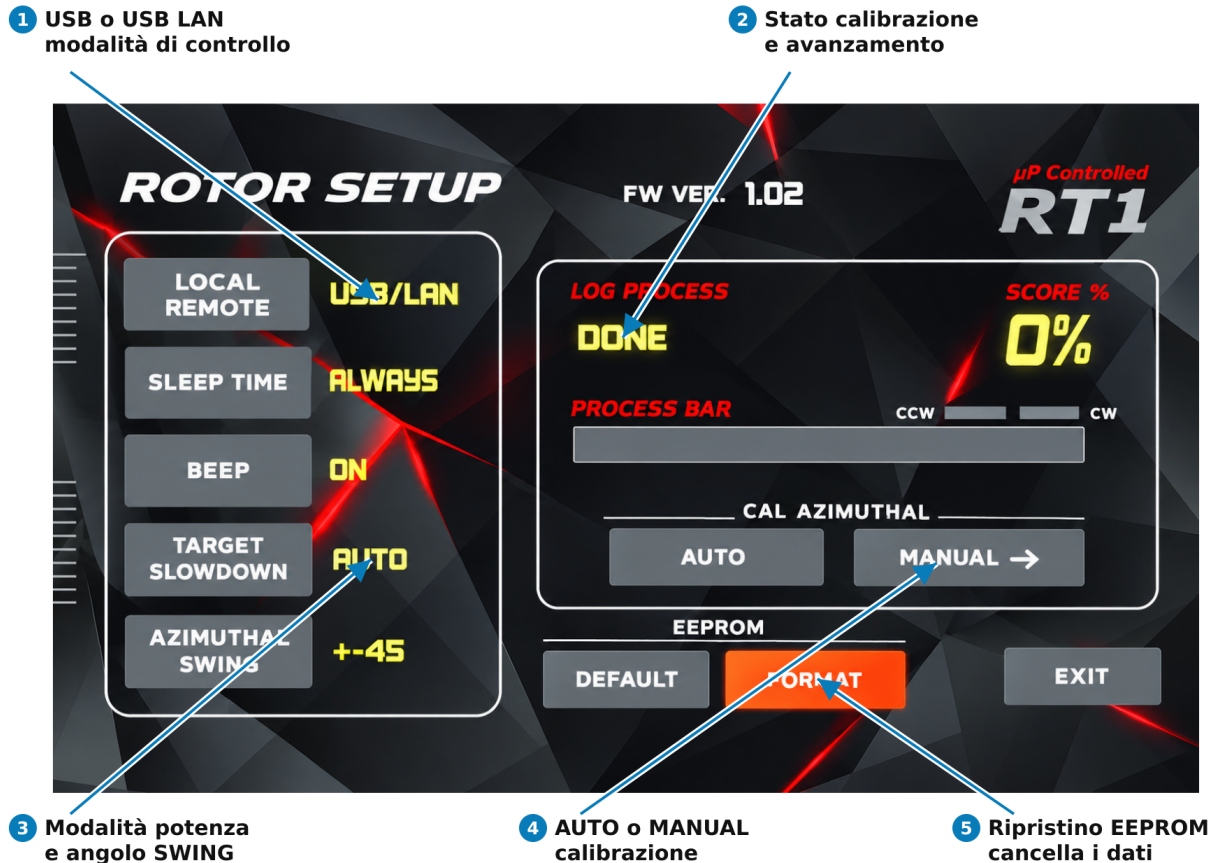


Figure 16 ROTOR SETUP: control mode, display, movement and calibration

1. Close all remote apps and perform the same checks as for manual calibration.
2. In ROTOR SETUP press AUTO under CAL AZIMUTHAL. The cycle takes approximately three minutes.
3. RT1 moves CW for 75 seconds at high speed and 12 seconds at low speed, waits and saves the CW reference. It repeats the sequence CCW and saves the CCW reference.
4. Wait for CAL DONE and 100%. The display then returns to DONE and clears the progress bar. The rotator ends at the CCW limit and antenna offset is reset.
5. Check normal positioning, restore the offset and verify presets and PARK.

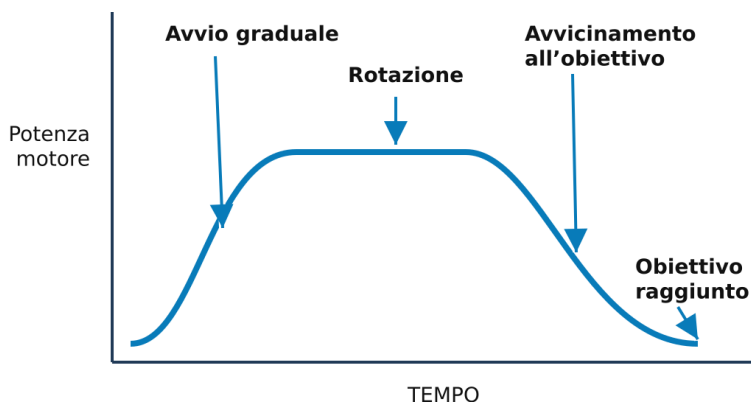
Interrupting firmware 1.02 calibration. Touchscreen STOP may temporarily stop the motor, but calibration may restart it in the next phase. To interrupt AUTO CAL, physically disconnect motor power. Restart RT1 and complete a valid calibration before automatic operation.

If an end stop is not reached within the allotted time, the stored reference may be incorrect. Correct the cause and use manual calibration.

Motor Power and SWING

AUTO adjusts motor power according to distance from the target and reduces it on arrival. Actual speed depends on the rotator, power supply and antenna load. In ROTOR SETUP, TARGET SLOWDOWN selects the available mode.

POTENZA MOTORE AUTOMATICA



Profilo indicativo La velocità dipende dal rotore e dal carico

Figure 17 Example of a gradual start and controlled approach to the target

MANUAL uses a fixed motor-power command. Firmware 1.02 may save a value different from the displayed value, even after changes to presets or offset. Check short movements after saving and use **AUTO** until the fixed setting has been verified with **METROPWR**.

Single Sweep and Return

1. Stop the rotator. In **AZIMUTHAL SWING** choose $\pm 20^\circ$, $\pm 45^\circ$ or $\pm 90^\circ$ and verify sufficient travel clearance on both sides.
2. Press **SWING**. RT1 moves to the CW side, waits two seconds, moves to the CCW side, waits two seconds and returns to the starting position.
3. Wait for **SWING DONE**. To cancel the cycle, use **STOP** on the local touchscreen.

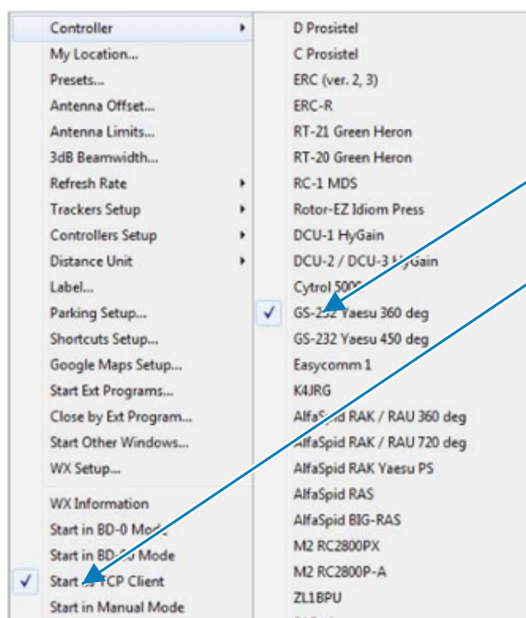
Example. Starting at a physical position of 180° , **SWING $\pm 45^\circ$** moves to 225° , then 135° , then returns to approximately 180° .

SWING LIMIT indicates insufficient clearance from the end stops. Each phase has a 30-second timeout; **SWEEP TIMEOUT** indicates an incomplete cycle. In firmware 1.02 a remote stop may leave the sequence active: keep local **STOP** accessible.

PSTrotator Compatibility

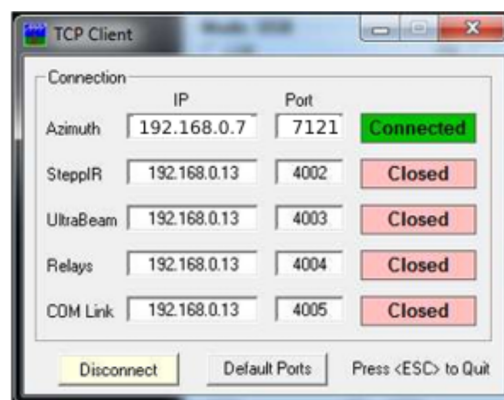
RT1 supports PSTrotator via a compatible Yaesu profile, over LAN or USB serial. The example selects GS-232 Yaesu 360 deg and starts PSTrotator as a TCP client.

Selezionare il profilo controller Yaesu



GS 232 Yaesu 360 deg
come illustrato nell'esempio

Abilitare Start in TCP Client
e inserire IP e porta di RT1



Esempio 192.168.0.7 Porta 7121

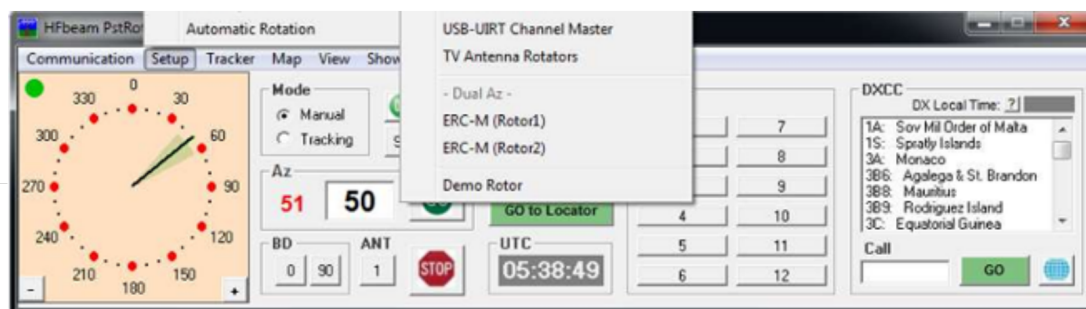


Figure 18 PSTrotator configuration example with RT1 address and port

1. In Setup select the illustrated compatible Yaesu profile and enable Start under TCP Client.
2. Set the Azimuth TCP destination to the RT1 IP address and control port, for example 192.168.0.7 and 7121. Connect and check the live azimuth.
3. Test a short movement and check STOP during normal use. Avoid duplicate antenna-offset corrections.

For USB, select the RT1 COM port at 9600 baud, 8 N 1 and close other apps using it. Available menus and profiles depend on the PSTrotator version. Configure limits for the installed rotator and use the RT1 calibration procedure.

Firmware, Restart and Troubleshooting

Firmware Update

Request the correct RT1 firmware package and instructions from METROPWR. Record important settings, stop the rotator and close all control apps. Connect USB-C, choose the COM port in the designated utility and use only files and parameters from the supplied RT1 package. Maintain the required electronics power until the update is complete; restart and verify calibration and STOP before use.

Restarting and Resetting Settings

RESET or a normal power cycle reloads saved settings. Wake the screen after startup. Firmware 1.02 restores USB/LAN on restart; select USB again to disable LAN control for the session.

DEFAULT and FORMAT erase configuration, including calibration. First stop the motor and close remote apps. When PRESS AGAIN appears, press the same command again within five seconds; otherwise the operation is canceled. After CAL REQUIRED, recalibrate and restore offset, presets, PARK and preferences. These commands do not change the IP address or web password of the separate LAN module.

Checks Before Contacting Support

Issue	Check
Blank screen at startup	Touch the screen or press the encoder. If it does not wake, check the DC supply.
Incorrect heading	Check end-stop calibration, potentiometer wiring and offset. Compare with the stationary antenna.
Stops short of target	Check the 60-second timeout, motor power, supply and mechanical travel.
Web page available but no movement	Check USB/LAN, TCP Server, Local Port Number 7121 and 9600 / 8 / None / 1. Match the IP and port in the app.
No USB connection	Use a data cable, check the driver and COM port, and close apps using that port.
Wrong antenna selected	Check SWA and SWB, the ZX7 control cable and actual RF path with transmission stopped.

When requesting support, specify rotator model, RT1 firmware, connection type and exact message. State whether the issue also occurs with local controls.

Software and support: www.metropwr.com • info@metropwr.com



Figure 19 Front-panel manual buttons and encoder reference

6 Product and Technical Specifications



Figure 20 RT1 front panel with touchscreen, manual buttons and encoder

Feature	Description
Rotator interface	Yaesu DC motor with position potentiometer
Documented models	G800DXA, G1000DXA and G2800DXA with model-approved cable
Power supply	13.8 V DC input Follow label for polarity and supply requirements
Display	7-inch color capacitive touchscreen Compass and map views
Heading and travel	Displayed azimuth 0°–359° Mechanical travel 0°–450° in this edition
Presets and offset	Seven heading presets plus PARK Antenna offset –180° to +180°
Calibration and movement	Two-limit manual calibration or AUTO AUTO or MANUAL motor power SWING ±20° ±45° ±90°
PC connections	USB-C serial and Ethernet LAN 9600 baud 8 N 1 serial Example TCP port 7121
Antenna switching	Two optional ZX7 switches Four positions each Independent A/B selections
Cablaggio posizione	Pin RT1 3 alimentazione 4 V Pin 4 cursore Pin 5 massa Pin 6 inutilizzato

For indoor use. Accuracy depends on installation, calibration and rotator feedback: a degree display does not guarantee one-degree mechanical accuracy. Product, firmware and manual may change without notice.

METROPWR www.metropwr.com • info@metropwr.com info@metropwr.com

NOTES: