



Wireless Technology, Inc.

RCU-J
Joystick Rack-Mount
Control Unit

Installation and
Operation Manual

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INFORMATION

FCC NOTICE

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 that may be received, including interference that may cause undesired operation.

READ THIS MANUAL

Every effort has been made to insure that this WTI system is of the highest quality. This product has been carefully inspected to comply with rigid quality standards before shipment to you. In consideration of your investment and the desire to obtain full performance capability engineered into your new WTI product, we recommend that you read this manual before attempting to operate your system.

FOR MORE ASSISTANCE OR MORE INFORMATION

WTI (Wireless Technology, Inc.)
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Ventura, CA 93003-7787

TOLL FREE. 866/gotowti (468-6984)
TEL. 805/339-9696
FAX. 805/339-0932

EMAIL: sales@wirelesstech.com

INTERNET: <http://www.gotowti.com> or
<http://www.wirelesstech.com>

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PRODUCT WARRANTY

PRODUCT WARRANTY

We appreciate your purchase of *Wireless Technology, Inc.* (WTI) security products. We take pride in the quality of our products and have manufactured each new WTI product to exacting quality standards. In normal use, it will provide you with years of satisfactory performance. However, should you experience difficulty; you are protected under the provisions of this warranty.

WTI warrants to the original user a product that is free of defects in materials and workmanship in normal use. WTI warrants to the original user that WTI's products will be free of defects in materials and workmanship in normal use for a period of 12 months from the date of sale. WTI's obligation under this warranty shall be limited to the repair, including all necessary parts and the cost of labor connected therewith, or at our option, the replacement of any product that shows evidence of a manufacturing defect within the warranty period.

This warranty is extended to all WTI products purchased and used within the United States of America and is valid only when service is rendered by the authorized WTI (*Wireless Technology, Inc.*) Warranty Station.

This warranty shall not apply to appearance or accessory items including, but not limited to, knobs, connectors, cabinets and connecting cables. This warranty shall not, in addition, apply to repairs or replacements necessitated by any cause beyond the control of WTI including, but not limited to, acts of nature, improper installation, misuse, lack of proper maintenance, accident, voltage fluctuations, unauthorized repairs or modifications.

This warranty becomes void in the event serial numbers are altered, defaced or removed, or an attempt is made to field service or alter performance of any WTI products.

WTI reserves the right to make changes in design, or to make additions to, or improvements upon, products without incurring any obligation to install the same on products previously manufactured.

The foregoing is in lieu of all other warranties expressed or implied and WTI neither assumes nor authorizes any person to assume for it any other obligation or liability in connection with the sale of our products. In no event shall WTI or its Authorized Dealers be liable for special or consequential damage arising from the use of this product, or any delay in the performance of this warranty due to causes beyond its control.

REPAIR AND RETURNS

REPAIR AUTHORIZATION

Please contact *Wireless Technology, Inc.* (WTI), to obtain a repair authorization number (RA) and provide the following information:

- 1.) Product Model & Serial Numbers.
- 2.) Date of shipment, purchase order number, sales order number or WTI invoice number.
- 3.) Details of the defect or malfunction. If there is a dispute regarding the warranty or product, which does not fall under the warranty conditions stated within the description of the written warranty, please include a written explanation with the product when returned.

SHIP FREIGHT PRE-PAID TO:

WTI (*Wireless Technology, Inc.*)
2064 Eastman Avenue, Suite 113
Ventura, CA 93003-7787
TEL 805/339-9696
FAX 805/339-0932

RETURNS

No unauthorized returns will be accepted. All returns must have an authorized (RA) number issued by the factory (CA number if returned for credit and RA number if returned for repair). Products returned for repair or credit will be rejected if no authorization number has been issued or freight has not been pre-paid. All merchandise returned for credit will be subject to a 20% restocking and refurbishing charge.

SAFEGUARDS

IMPORTANT SAFEGUARDS

- 1.) Read Instructions. It is important to read all safety and operating instructions before installing or using this equipment.
- 2.) Retain Instructions. Retain this manual and any supplements for future reference.
- 3.) Follow Instructions. Follow all instructions herein for use of this equipment.
- 4.) Heed all warnings. Adhere to all warnings on the equipment, and in this manual.
- 5.) To reduce the risk of electric shock or equipment damage, work on the unit only when the power is shut off and is unplugged from its power source to prevent accidental activation. Also take precautions to avoid contact between the equipment and other electrical wires or power sources that may be present at the installation site.



INTRODUCTION

GENERAL INFORMATION

WTI's RCU-J, Joystick Rack Mount Control Unit provides ergonomically designed controls for operation of a pan/tilt/zoom camera in a compact, rack-mounted enclosure. It also provides the interface between a remote host control system and the camera.

The RCU-J typically operates at 115 VAC. However, the internal power module is capable of operating from 90 V AC to 264 V AC, 47 to 63 Hz. Units modified with a different power plug may operate at other voltages in this range. Note that any camera connected to the RCU-J unit will receive the same operating voltage as is applied to the RCU-J. So, be sure that the camera is intended to operate at the voltage applied to the RCU-J AC input, or provide a suitable step-down transformer for 24 VAC camera operation.

LOCAL OPERATION

Local mode operation of the RCU-J is selected by the left-most front panel switch. When in local mode the RCU-J front panel controls allow the camera to be moved and allows the zoom and lens settings of the camera to be changed. In the local mode, the rear panel remote Host connections are disabled.

The 3-axis joystick provides control of the pan, tilt and zoom functions of the camera. The camera focus and iris functions can be set to allow manual control for special lighting or other unusual viewing conditions by operating the auto/manual switches for the respective function. The iris and focus controls revert to the automatic mode when the cameras pan, tilt or zoom position is changed.

The Local mode is also used when interfacing to a Laptop PC or hand held controller via the front panel RS-232 connector. This configuration may be used to upgrade camera software or to perform other maintenance functions. Graphical User Interface (GUI) software is also available for setting various camera functions. WTI's control units (HHC-SW and DTC-720) are also suitable for use with setup and maintenance of the RCU-J.

REMOTE/HOST OPERATION

Remote/Host mode is selected by the left most front panel switch. In Remote/Host mode, the camera serial control interface is routed to one of the rear panel communications connectors, to allow the camera to be controlled by a computer or other remote serial control device. Either the RS-232 or RS-422 port may be used, but not both at the same time.

The default camera protocol for remote host operation is usually Pelco D protocol, with some additional commands added to allow control of features not supported in the Pelco protocol standard. See the camera documentation for a list of supported functions. Other camera protocols may also be used with the RCU-J. Please contact WTI for information regarding use of cameras with other protocols.

FRONT PANEL FEATURES

Front Panel Features

Item	Group	Name	Function
1		LOCAL RS-232	Serial input for a laptop computer running GUI software or WTI HHC-SW hand-held controller to set up and maintain a camera.
2		VIDEO OUT	75Ω video output for a use with a local monitor while controlling the camera with the RCU.
3		POWER INDICATOR	Illuminates green when the front panel power switch is set to the on position.
4	SWITCH LOC	LOCAL CONTROL INDICATOR	Illuminates red when camera is being controlled by the front panel switches or LOCAL RS-232.
5	MODE SWITCH REM	REMOTE CONTROL INDICATOR	Illuminates green when camera is being controlled by rear remote host jacks. Disables front panel camera controls.
6	3 AXIS JOYSTICK	LEFT / RIGHT	Pans the camera left and right.
		UP / DOWN	Tilts the camera up and down.
		ZOOM IN / ZOOM OUT	Adjusts the Zoom Magnification
7	FOCUS	AUTO / MANUAL	Selects temporary manual control of the camera focus.
8		MANUAL INDICATOR	Illuminates red when manual control of focus is selected, which enables the FAR / NEAR switch operation.
9		FAR / NEAR	When enabled, manually controls the focus to farther away (FAR) or closer NEAR). NOTE: These manual adjustments remain valid until the camera position is changed, at which time the camera reverts to the AUTO FOCUS mode.
10	IRIS	AUTO / MANUAL	Selects temporary manual control of the camera iris.
11		MANUAL INDICATOR	Illuminates red when manual control of iris is selected, which enables the OPEN/CLOSE switch operation.
12		OPEN / CLOSE	When enabled, manually controls the iris to open or close. NOTE: These manual adjustments remain valid until the camera position is changed, at which time the camera reverts to the AUTO IRIS mode.
13	RESET	RESET SW	Recessed pushbutton switch to Reset the Camera and allow firmware upgrades via the Local RS232 connector. Contact WTI for further information.
16	RESET	RESET INDICATOR	Illuminates red during the reset mode. Automatically times out after 30 seconds of communication inactivity.
<p><i>Functions described above assume the camera has the capability described. All switches are momentary contact.</i></p>			

PINOUT CONNECTORS

Pinout for Front and Rear Panel **RS-232**
Connectors:

PIN	Function
1	Not Used
2	RX
3	TX
4	Not Used
5	Ground
6	Not Used
7	RTS
8	CTS
9	Not Used
Connector: DB-9 Male Pins.	
Requires DB-9 Female mating connector.	

Pinout for Rear Panel **RS-422 or RS-485**
Connectors:

PIN	Function
1	TX +
2	TX -
3	Ground
4	RX +
5	RX -
6	Ground
7	Not Used
8	Not Used
9	Not Used
Connector: DB-9 Female Pins.	
Requires DB-9 Male mating connector	

REAR PANEL FEATURES

MECHANICAL CHARACTERISTICS

WTI's RCU-J is constructed as a standard 1.75" panel in a 19" rack mount configuration. All operator controls appear on the front panel and standard system interconnections are located on the rear panel. During local control operations, a TV monitor may be connected via the BNC connector located on the front panel and a laptop or one of WTI's controllers (HHC-SW or DTC-720) may be connected to the RS-232, nine pin, D connector located on the front panel of the unit.

REAR PANEL FEATURES

Item	Name	Function
1	Power Switch	Depressed on the top is power on. Depressed on the bottom is power off. A green front panel indicator illuminates when power is on.
2	Line Cord	A permanently attached 5-foot line cord has a 3-wire grounded type plug for 115 V AC power.
3	AC Power and Control Connectors	Provide power, video and serial data communications to the camera. Note: Camera power at these connectors is identical to the RCU-J power (typically 115 V AC). Make sure the camera will tolerate this voltage, or provide a suitable step-down transformer for 24 VAC operation.
4	RS-422 Connector	DB-9 female (socket) connector to the remote Host controller using RS-422 or RS-485 communications protocol.
5	RS-232 Connector	DB-9 male (pin) connector to the remote Host controller using RS-232 communication protocol. On an NTCIP version of the RCU this is the port that must be used.
6	BNC Connector	75 Ω video out. This connector supplies video from the camera. This video would typically be applied to a fiber optic or other type converter device for sending the camera video long distances back to an operator console.

CABLES AND CONNECTIONS

CAUTION

The power applied to the RCU-J is directly hard wired back out to the camera connector on the rear panel. Be sure the connected camera/dome will operate properly from this power.

CABLING REQUIREMENTS

- 1.) Two removable Phoenix connectors are provided for convenient connection of the camera power and control signals.
- 2.) Either an RS-232 or RS-422 cable is required for host serial communications with the unit. Only one is required. Both rear panel connectors are active at all times, but only one can be used at a time. Never connect serial data to both connectors simultaneously. No damage to the unit will occur, but communications will be corrupted and unreliable.
- 3.) A 75 Ω coaxial cable is required to connect video to the system interface device.
- 4.) For setup and maintenance operations via the front panel, an RS-232 null modem serial cable is required to connect between the LOCAL RS-232 connector and a PC. This cable must have DB-9 female (socket) connector to mate with the LOCAL 232 connector on the front panel and typically also a DB-9 female (socket) connector at the PC 232 serial connector port.

CONNECTOR TX AND RX CONVENTIONS

The Tx+ Tx- and Rx+ Rx- notations for these RS-422 connectors and all other RS-422 connectors in a system using this notation cause much confusion for field installers. There is a tendency to want to connect Tx to Tx and Rx to Rx. Tx+ output of one piece of hardware should go to the Rx+ input of another. Tx- goes to Rx-. However, to add to the confusion Tx and Rx are not universally used notations for the same functions. Sometimes Command Out is used for Tx and Command In for Rx. Other naming conventions are also used among different equipment manufacturers and their cables. Because RS-485 provides bidirectional communications over the cable a connector can be an input at one moment and then an output milliseconds later (RS-485 half-duplex). Thus, the identifying labels that connectors and wires are assigned can be somewhat arbitrary. Wiring for RS-232 has the same situation. Tx typically goes to Rx and at the other end Rx to Tx.

PIN FUNCTIONS AND INTERFACE

Rear Panel Camera Connectors

PIN	Function
VID GND	Video Shield Ground
VID	Video Signal, 1Vpp, 75Ω
CHSY	Camera Chassis Ground
GND	Data Shield Ground
+TX	TX + (RS-422)
-TX	TX - (RS-422)
+RX	RX + (RS-422)
-RX	RX - (RS-422)

PIN	Function
SAFETY GND	AC Input Safety Ground Connection (RCU Chassis)
Line H	AC Line High Side Input
Line L	AC Line Low Side Input

INTERFACE

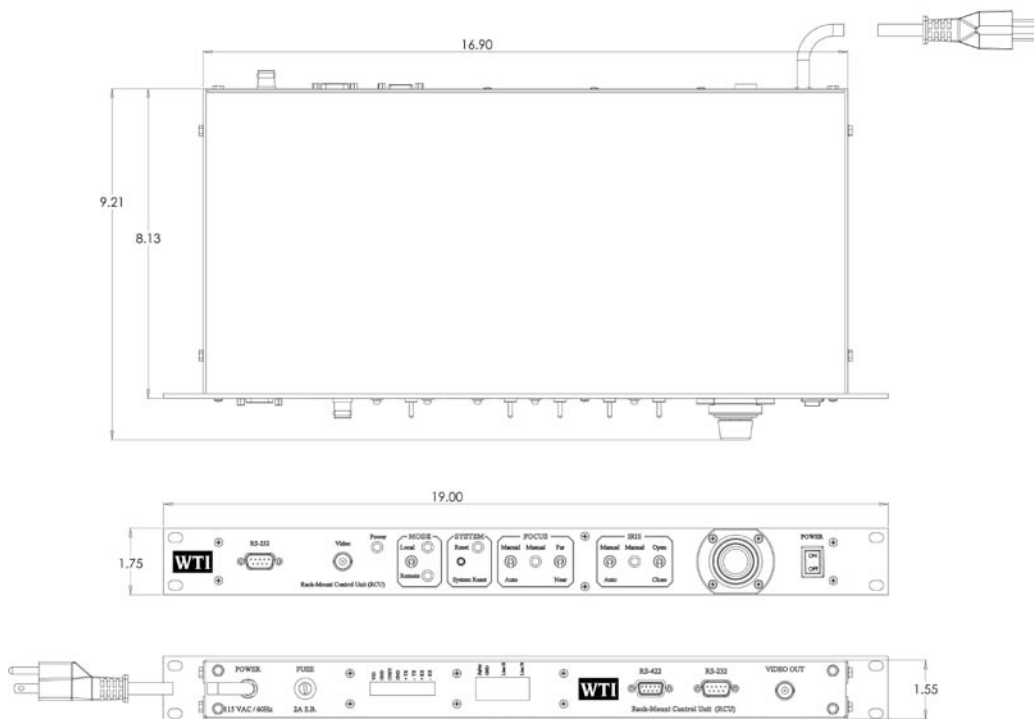
Required Camera Cable Characteristics

Conductor Function	Minimum Characteristics
VIDEO	RG-59/U (75Ω), 100 % copper conductor, 95% minimum braided shield.
DATA	2 pair, twisted with overall shield, 26 AWG minimum (Belden 8723 or equivalent).
POWER	3-conductor, 22 AGW to 16 AWG depending on length.
<i>NOTE: For distances exceeding 750 feet, please contact one of WTI's "Solutions Specialists."</i>	

TECHNICAL SPECIFICATIONS

ELECTRICAL	
Input Voltage	115 V AC with line cord provided. 90 to 264 V AC, 47 to 63 Hz; NEMA TS-2 Standard 2.1.2 when modified with other appropriate line cord (Attached camera must operate from input voltage used).
Input Power	20 VA for Panel alone; a typical attached camera/dome with heaters on may draw an additional 70 VA. Check camera/dome specifications for actual power.
MECHANICAL / ENVIRONMENTAL	
Finish	White powder coat face with black powder coat body.
Dimensions	19.00" wide x 1.75" high x 8.00" deep.
Mounting	EIA Standard 19" cabinet, 1 Rack Unit (RU).
Weight	5 lbs. (2.27 kg).
Ambient Temperature, Operating	-34 to 74 °C (-30 to 165 °F) NEMA 2.1.5.1 standard TS-2 (1998).
Ambient Temperature, Storage	-45 to 85 °C (-50 to 185 °F) NEMA 2.1.5.1 standard TS-2 (1998).
Humidity	Up to 90% relative humidity.

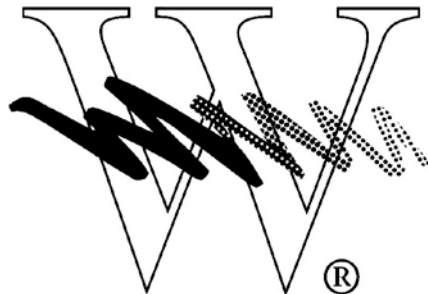
Note: Camera receives same AC power as the AC input power applied to the RCU-J. This is 115 V AC for a standard unit, but a standard or unit modified with a different line cord could operate at any voltage in the range from 90 to 264 V AC, 47 to 63 Hz. Be sure the camera is capable of operating from the unit input power.



(dimensions are shown in inches)



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An ISO 9001:2008 Certified Company



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Due to Wireless Technology, Inc. (WTI) continuing efforts to engineer the best product that is most responsive to our customer's needs, the above specifications are subject to change without notice.