



Making it easy for you to save water, time and money

## WT-RUG3 RTU CONTROLLER and/or BASE STATION



Fully Integrated Remote Terminal Unit/Controller:  
Monitor, Display, Communicate & Control



### FEATURES

- ▶ Controller w/LCD display & keyboard
- ▶ RF Assembly
- ▶ AC-DC Power supply and 12 VDC battery
- ▶ External twist-on waterproof connectors installed on NEMA 4X enclosure
- ▶ Easy to use canned RTU software for monitoring and control applications
- ▶ Serial communications
- ▶ Low-cost SCADA control software
- ▶ On-board modem - two com ports
- ▶ Supports wide variety of radios, works as a Repeater Station in the background
- ▶ Anyone can operate and install - designed for ease of use by non-technical staff; twist on the sensors, turn RTU on, install setpoints, i.e.: tank levels to start/stop a pump and go
- ▶ Attach up to 12 analog and digital sensors and control for up to (4) 10A relays - monitor anything: control systems, equipment, and processes
- ▶ Strong performance record
- ▶ Proven cost competitive
- ▶ 3 Year warranty: parts and assembly
- ▶ Custom RTU and SCADA software available
- ▶ WER3 fully integrates with larger RTUs in Watch Technologies' product line
- ▶ Includes "overactive" support: any job, anywhere, all the time
- ▶ Applications in industry, agriculture, military, security, & regular applications



**WT-RUG3  
RTU CONTROLLER  
Details Specifications**

page 2



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- ▶ **LOGIC FAMILY:** All low power CMOS
- ▶ **MICROPROCESSOR:** 16-bit MSP430, 8 Mhz, 16 bit data bus, 16-bit address bus.
- ▶ **MEMORY:** RAM-2 Kbytes battery backed low power static RAM
- ▶ **PROGRESS FLASH:** 512 Kbytes
- ▶ **LOGGING FLASH:** 512 Kbytes
- ▶ **BATTERY BACKUP:** Lythium coin cell backs up RAM & real-time clock/calendar min 2 years.
- ▶ **DISPLAY:** 2 lines X 16 char backlit LCD, sunlight readable, backlight switchable by software.
- ▶ **KEYBOARD:** 16 key sealed tactile membrane with interrupt scanning
- ▶ **REAL-TIME CLOCK/CALENDAR:** Battery backed clock/calendar 0.005% crystal accuracy
- ▶ **OPERATION SECURITY:** Watchdog Timer-Hardware timer resets unit .5 seconds after interrupt fail. Cannot disable.
- ▶ **TELEMETRY WATCHDOG:** Reset rcv buffer of no character received within 1 sec.
- ▶ **BROWNOUT DETECTOR:** Halts process if logic voltage falls below 2.7 V, restarts when voltage rises to 3V.
- ▶ **AUTOBOOTING:** Auto startup on power application
- ▶ **I/O SURGE PROTECTION:** All I/O is optically isolated, meets IEEE surge protection requirements.
- ▶ **ANALOG INPUTS-12bit:** 6 channel per board, 12 bit res, successive approx, optically isolated, 4-20 mA or 0-5V. Factory calibrated.
- ▶ **ANALOG OUTPUTS:** 4 chan optional, 12 bit resolution, optically isolated, each module replaces one relay. Factory calibrated.
- ▶ **DIGITAL INPUTS:** Status-8 chan, dry contact compatible, self-powered Pulse Counting-All DI count 128 PPS
- ▶ **PULSE DURATION DETECTING:** All can convert pulses to analog with 4ms resolution
- ▶ **SHAFT ENCODER** - DIs in pairs used to code shaft encoders.
- ▶ **DIGITAL OUTPUTS:** 4 ch, 10 amp relays
- ▶ **PULSE DURATION OUTPUTS** - Relays can generate pulse width modulated or one shot signals with 4 ms res.
- ▶ **ANEMOMETER INPUT:** AI6 connected to clipping amp, counted to derive windspeed.
- ▶ **REFERENCE OUTPUT:** 2.5 Vdc reference available to power potentiometers, shares pin with DI8.
- ▶ **INSTRUMENT POWER:** Logo supply switchable to battery voltage and can be switched on/off by software. Diode isolated.
- ▶ **SERIAL PORTS:** One programming/gen purpose port plus one RS232/modem port
- ▶ **MODEM:** Bell 103 standard
- ▶ **RADIO INTERFACE:** 4-wire audio, adj gain, xformer isolated, optically isolated key line. Low tones mode for splinter chan.
- ▶ **PHONE LINE INTERFACE:** 4 wire audio adj. gain, transformer isolated.
- ▶ **TRANSMIT POWER:** 0-4Vp-p, software adj. in 32 steps
- ▶ **COMMUNICATIONS:** ASCII-Standard R9 protocol-background CRC gen/decode, variable length messages, user defined message length. Can combine status, integer, float, in any message.
- ▶ **EAVESDROP MODE:** R9 protocol, any RTU can accept data passing between any other station.
- ▶ **PEER TO PEER:** Full RTU to RTU or RTU to Master or Master to RTU messaging.
- ▶ **STORE & FORWARD:** Initiating station sets path through up to 3 intermediary stations.
- ▶ **ADDRESS RANGE:** 1 to 254
- ▶ **POWER INTERFACE:** 2 VDC +/- 20%, diode isolated. <3mA normal operations (relays, loop supply & backlight off) to 440mA max.
- ▶ **LOOP SUPPLY:** Built-in switchable regulated 24 VC +/- 5%, 120 MA.
- ▶ **I/O CONNECTIONS:** All I/O uses removable rising cage screw headers in banks of up to 10 each, 14 ga wire. Modem signals use RJ45 jack.
- ▶ **SOFTWARE:** Storage-operating system and all user configuration & programming stored in nonvolatile flash memory. Flash loader stored in flash protected boot block.
- ▶ **SECURITY:** Parameter voting & memory integrity test on boot up, CRC gen/direct on serial ports. Programm loading CRD protected.
- ▶ **SCANNING:** Built-in software scans all I/O, ports, timers real-time clock.
- ▶ **PROGRAMMING MODULES:** Applications use precompiled modules resident in flash memory where programmer interconnects modules and sets properties using supplied Win95/98/NT/XP program. No programming required for most applications.
- ▶ **LADDER LOGIC:** Built into the WIN95/98/NT/XP configuration program to handle misc controls.
- ▶ **DATA LOGGING:** Logs floating point, integer and status samples with time tags to onboard flash eeprom. 128K samples & time tags. Can dump logs to serial port as comma delimited ASCII.
- ▶ **VARIABLES:** Supports 16 bit integer, 32 bit floating point, boolean strings and arrays.
- ▶ **ERROR MESSAGES:** Configuration program handles all setup errors. Runtime software is self-protecting, no runtime errors.
- ▶ **ENCLOSURE:** 16 ga steel, blue powder coat card cage w/ display/keyboard module.
- ▶ **TEMPERATURE RANGE:** -40 to +85 degrees C logic  
-20 to +60 degrees C LCD display