

# RioExpress-SC™

## Specialty Wireless I/O - Model G309



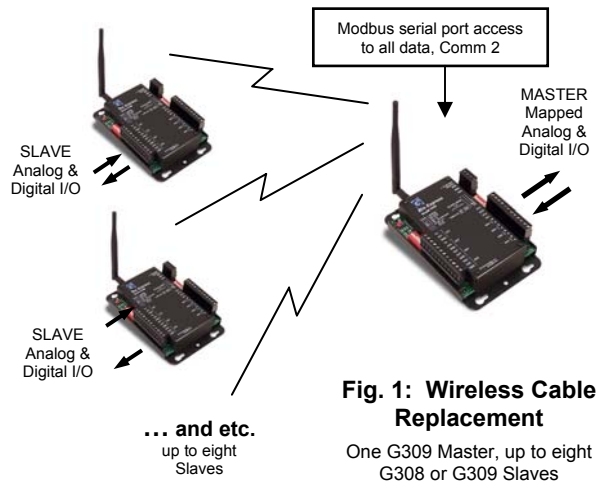
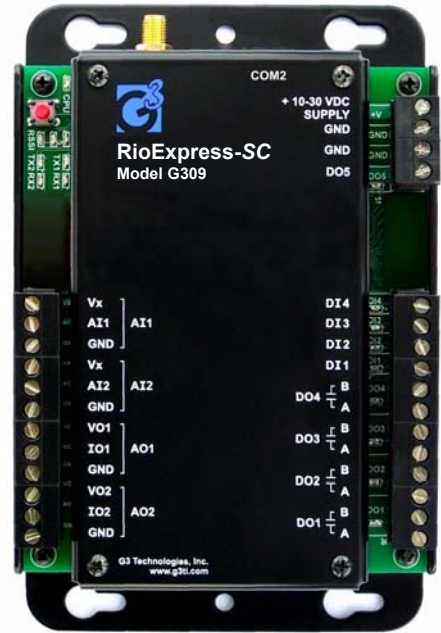
The RioExpress-SC is a user-friendly software-configurable Wireless I/O & Data Concentrator with integral high performance Spread Spectrum Radio and outstanding overall performance. Use it to reliably access remote or hard-to-reach Digital & Analog process signals for both monitoring and control. The RioExpress-SC is sister to the G308 RioExpress, and provides additional configuration features and flexibility.

- Use RioExpress-SC modules to replicate (mirror) analog and digital I/O signals for **Cable Replacement** with one configured as Master and up to 8 as Slaves (along with Modbus data access on Comm 2). See Fig. 1. In most cases the Slaves can be G308 or G309.
- Use the RioExpress-SC as a **MODBUS Slave Wireless I/O** with a Controller of your choice (PLC, RTU, PC & etc.) as Master. See Fig. 2.

Built for environmental tolerance and very low power consumption, it is ideal for use with **Solar Power** or other alternative-energy source.

### FEATURES:

- Simple software configuration using G3 AXS config utility
- Exceptional wireless performance (900MHz or 2.4GHz) with advanced comm. settings including Radio Repeater function.
- Two or more units replace multi-pair signal cables
  - Master unit acts as Modbus data concentrator with serial port access simultaneous to mapped I/O replicating.
  - Self-managed wireless Master/Slave communications
  - Configurable update rate & power-save modes
  - I/O count: 4 ea. DI, 4 ea. DO, 2 ea. AI, 2 ea. AO (Mirror I/O between Master and Slave or Map I/O between Master and multiple Slaves, bidirectional)
- Standard MODBUS Slave Wireless I/O end device
  - Point-to-point or point-to-multipoint
  - Addressable for up to 253 Slaves per RF Channel
  - I/O count: 4 ea. DI, 4 ea. DO, 2 ea. AI, 2 ea. AO (plus Battery Voltage monitoring, AI3)
  - DI1-2 also Pulse totalize/rate or "event capture"
  - DOs timed or latched
- Internal 24V transducer supply, and power-management settings
- Configurable Fail-Safe action for DOs & AOs upon Comm Fail
- Self-resetting fuses & all-around surge protection

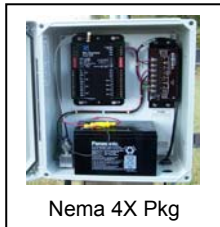


**Fig. 1: Wireless Cable Replacement**

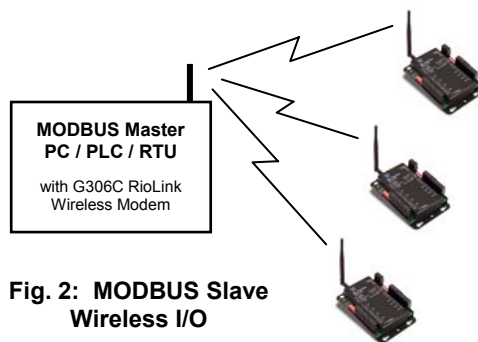
One G309 Master, up to eight G308 or G309 Slaves



Typical Installation



Nema 4X Pkg



**Fig. 2: MODBUS Slave Wireless I/O**

Up to 253 RioExpress SC Slaves

### APPLICATIONS:

- Isolated I/O locations with no power or cabling
- Impractical or impossible I/O cable runs
- Remote I/O for PLC or RTU based systems
- Specific Monitoring/Control applications include:
  - Oil/Gas Wellhead & Facilities
  - Water/Wastewater
  - Solid Waste Landfills
  - Bulk storage tanks
  - Pumps & pump stations
  - Fixed and mobile machinery/vehicles
  - Environmental monitoring
  - Security

*Is cabling impractical or too costly? Experience RioExpress-SC!*

# G309-xx Specifications (see G309 User's Guide for more detailed info)

<b>RADIO SPECIFICATIONS:</b>	Antenna connector: RPSMA female, 50 ohms. *Antennas sold separate
Indoor/Urban Range (w/ 2.1 dB dipole antenna)	900MHz, up to 1500' (450m); 2.4GHz, up to 600' (180m)
Outdoor RF line-of-sight Range (w/ 2.1 dB dipole antenna)	900MHz, up to 7 miles (11km); 2.4GHz, up to 3 miles (5km)
Outdoor RF line-of-sight Range (w/ high gain antenna)	900MHz, up to 20 miles (32km); 2.4GHz, up to 10 miles (16km)
TX Power / RX Sensitivity	100mW / -110dBm (900MHz); 50mW / -107dBm (2.4GHz)
<b>DATA COMMUNICATIONS:</b>	
Data Rate (Throughput)	9600 baud (bps)
Configurable features, G3 AXS	<ul style="list-style-type: none"> <li>6 RF Net codes (Hopping Sequence or "Channel")</li> <li>253 Device Address (per Channel)</li> <li>Poll rates, power-save modes, comm. fail timing and fail-safe options</li> <li>Radio Repeater (this feature is not compatible with the G308 RioExpress).</li> </ul>
Master/Slave comm.	With one configured as Master and up to 8 as Slaves: Self-managed data communications and I/O mapping (based on config. settings on Master), Master acts as data concentrator allowing Modbus polling (COM2) to read/write registers for all Slaves.
Modbus Slave	Standard Modbus Slave RTU protocol. Poll from any Modbus Master (PLC, RTU, etc), using compatible SS Radio Modem (i.e. Model G306C-xx Wireless Modem)
Comm. Fail Action	<ul style="list-style-type: none"> <li>Comm Fail time-out up to 18 hrs., one sec. increments</li> <li>Comm Fail turns on DO5 open-collector sink driver (300mA, 30Vdc max load)</li> <li>Fail-safe action on DOs and AOs (hold or go to selected value).</li> </ul>
<b>INPUTS &amp; OUTPUTS (I/O):</b>	
Digital Inputs (DI)	<ul style="list-style-type: none"> <li>4 ea. Digital Inputs (DI1-4), non-latching, pluggable screw terminals</li> <li>DI1-2 are also transition-sensing for totalize/rate or event-capture (not accessible with cable-replacement mode).</li> <li>Optical coupled for surge and noise tolerance</li> <li>Active low (power common), non-latching, approx. 4mA wetting current</li> <li>Power-save mode includes optional DI power-down</li> </ul>
Digital Outputs (DO)	<ul style="list-style-type: none"> <li>4 ea. Digital Outputs (DO1-4), Normally-open (N.O.) dry Relay contacts</li> <li>Contact rating: 2 Amps 250Vac / 30Vdc General Purpose, Pilot Duty D150</li> <li>Modbus registers for Latched DOs or Timed DOs (Timed DOs not accessible with cable-replacement mode).</li> <li>Selectable "Comm Fail" action on DO1-4 (Hold current state, or go to pre-selected state)</li> <li>DO5: Comm Fail turns on DO5 open-collector sink driver (300mA, 30Vdc max load)</li> </ul>
Analog Inputs (AI)	<ul style="list-style-type: none"> <li>2 ea. Analog Inputs (AI1-2), single ended</li> <li>0-5Vdc (1-5V) or 0-20mA (4-20mA), DIP Switch selected for each AI (under the cover)</li> <li>12 bit resolution. Overall accuracy 0.25% FS. Typical 0.1% at 25 degrees C.</li> <li>Over-voltage tolerance of +/-30Vdc.</li> <li>Transducer power (Vx) is on screw terminal with each AI; Select 12V or 24V. Power-save mode includes optional Vx power-down.</li> <li>Third Analog Input (AI3) internally monitors power supply voltage; 0-32 Volt range (not accessible with cable-replacement mode).</li> </ul>
Analog Outputs (AO)	<ul style="list-style-type: none"> <li>2 ea. Analog Outputs (AO1-2), single ended</li> <li>Both 0-5VDC (1-5Vdc) and 0-20mA (4-20mA) provided. Voltage outputs are recommended for low-power apps.</li> <li>Overall accuracy 0.45% FS. Typical 0.2% at 25 degrees C.</li> <li>Selectable "Comm Fail" action on Analog Outputs (Hold current value, or go to pre-selected value)</li> </ul>
<b>POWER INPUT:</b>	
Input Voltage/ Power	10-30 Vdc, 5 Watts max.
Current, Power-Save (I <sub>PS</sub> )	I <sub>PS</sub> = 9mA @ 12Vdc
Current, Receiver/Standby (I <sub>RX</sub> )	I <sub>RX</sub> = 40mA @ 12Vdc
Current, Transmit (I <sub>TX</sub> )	I <sub>TX</sub> = 72mA @ 12Vdc
Actual installed current draw	Actual average current draw varies with Poll Rate and Power-Save settings. Also, Sensor and I/O Current loads add to the overall Supply Current requirements
<b>MISCELLANEOUS:</b>	
Operating Temperature	-40 to 85 degrees C., 5-95% non-condensing humidity
Diagnostics	LEDs: CPU status, RSSI, TX/RX on COM1 & COM2, DIs, DOs and Comm Fail. LED Enable is toggled with Pushbutton, and has a 30 min. timeout.
Data Comm Port 2 (COM2)	4 pin latching header RS232, used for device configuration and Modbus Slave data access.
Surge protection	All power, serial port and I/O connections meet or exceed minimum standards for ESD, EFT, and Surge withstand per the international IEC 1000-4 standards
Certifications	FCC Part 15 Class A; CSA C/US Class I, Div 2, Groups A,B,C,D hazardous locations, Temp Code T4
<b>PHYSICAL:</b>	
Field Wiring Connections	All wire connections are pluggable screw terminals, 0.2" spacing.
Size & Weight	Dimensions, 6.3" long x 4.15" wide x 1.55" high overall; Weight 11 oz. (300g)
Mounting	Panel mounting, 5.7" x 2.6" rectangular pattern "key-hole", #6 or #8 pan-head screws recommended. Optional clip available for DIN Rail mounting.

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