WL40F Series
900 MHz ISM Band Wireless I/O System

- Licence-free 900 MHz ISM band
- FCC Part 15 compliant wireless module*
- Modbus-RTU transparent gateway and I/O
- Multi-hop technology solves various challenges of implementing a reliable wireless communication network.
- Supporting of low-speed moving devices makes the WL40F Series ideal for data gathering for AGVs.

* This device is approved for use only in the US.

**FCC Part 15 compliant**

M-System WL40F Series Wireless I/O System employs a licence-free 900 MHz ISM band module. Compared with 2.4 GHz / 5 GHz wireless LANs and other wireless networks dedicated for instrumentation using higher frequency bands, the 900 MHz band ensures stable communication quality for a long distance transmission, suitable for telemetering, multiplex transmission systems and data logging applications with various sensors/devices including low-speed moving entities.

Modbus-RTU transparent devices can easily replace existing wired ones, and various industry standard sensors/devices can be added to the network.

**MULTI-HOP TECHNOLOGY**

Multi-hop wireless communication is a wireless network conveying data through a number of wireless communication devices in a “bucket-brigade” manner. Relaying paths are automatically switched to an alternative one when one section of the connection is weak.

In the WL40F Series, up to 100 child stations connect to a single parent station. The communications distance between stations can be up to 0.62 miles (1 km), thus making it possible to construct a wireless network in a wide range.

**SYSTEM CONFIGURATION EXAMPLE**

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Device</td>
<td>Gateway</td>
</tr>
<tr>
<td>WL40EW2F</td>
<td>Gateway</td>
</tr>
<tr>
<td>WL40MW1F</td>
<td>Gateway</td>
</tr>
<tr>
<td>WL40W1F-DAC4A</td>
<td>I/O, Di x 2, Do x 2</td>
</tr>
<tr>
<td>WL40W1F-DS2</td>
<td>I/O, 4-20 mA active input x 2</td>
</tr>
</tbody>
</table>

**Radio wave test**

Required before introducing the system.
### Remote control of automated guided vehicles

- **Display and control signal**: Annunciator
- **Start signal**: Child
- **Stop signal**: Child
- **Error signal**: Child
- **Stop command**: Child

### Predictive maintenance of injection molding machines

- **Injection molding machine A**: Operating status
- **Injection molding machine B**: Operating status
- **Injection molding machine N**: Operating status

### Remote monitoring and control of greenhouses

- **Inside temperature**: Child
- **Outside temperature**: Child
- **Humidity**: Child

### Remote monitoring of food warehouses

- **Temperature**: Child
- **Humidity**: Child

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**POWER & WIRELESS SPECIFICATIONS**

- **Power input**: 12 V or 24 V DC
- **Communication standard**: IEEE 802.15.4g
- **Frequency**: 900 MHz band (902 to 928 MHz)
- **Max. transmission power**: 20 mW
- **Band width**: 400 KHz
- **Modulation**: GFSK
- **Baud rate**: Max. 100 kbps
- **Channels**: 1 to 43 ch
- **Security**: 128 bit AES
- **Indicator LEDs**: 920Run, 920Link, 902ERR (child devices)
- **Number of child devices**: Max. 100
- **Protocol**: Modbus-RTU
- **Communication module**: Coordination module (parent) and router module (child) by Oki Electric Industry Co., Ltd.
- **Radio parameters setting**: Web browser (parent) and configuration software (child)
- **Max. transmission distance**: Approx. 0.62 miles (1 km)