900 MHz Spread Spectrum Radio

The Click 400 is a 900 MHz spread spectrum radio with two RS-485 ports and one RS-232 port which are active at all times. The Click 400 auto-detects the serial settings of a SmartSensor™ network for quick and easy installation.

Features

- Converts half-duplex serial to 900 MHz and vice versa
- Mounts on a DIN rail for quick and easy installation
- Autobauds to serial port devices
- Includes multiple communication ports for RS-232, RS-485 and 900 MHz radio communications
- Uses either 900 MHz or serial interfaces to configure the device
- Conformal coated
- Direct cable replacement with a distance of over 20 miles (line of sight)
Technical Specifications

Physical
- Weight: 0.2 lbs (0.1 kg)
- Physical dimensions: 4.5 in. x 4 in. x 0.9 in. (11.4 cm x 10.2 cm x 2.3 cm)
- Ambient operating temp: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Mounting
- DIN rail-mountable
- Hot-swappable

Power
- Power supply voltage: 10 to 30 VDC
- Power consumption: 1.6 W average power when transmitting at 1000 mW with a duty cycle of 15% at 10 VDC to 24 VDC

Connections
- Device has the following connection points:
  - Power: 5-position connector for connecting from the T-bus
  - RS-232: DB-9 connector
  - RS-485: 5-position connector for connecting from the T-bus as well as one pluggable screw terminal
  - Wireless: reverse polarized SMA male connector for connecting an external antenna

Communication
- Converts RS-232 to RS-485 and vice versa
- Converts serial communication (RS-232 and RS-485) to spread spectrum wireless 900 MHz

RF Specifications
- 32 different channels in the US
- 56 bit DES Encryption
- 256 Byte input and output buffer
- Operate 902-928 MHz frequency band using frequency hopping spread spectrum
- Adjustable transmitted RF power from 1mW to 743mW.
- -110dB receiver sensitivity in “Long Range” mode
- 20 mile range at full power with directional 6 dBi Yagi antenna
- Point to multipoint configuration where a single master is able to transmit the same data to multiple slaves at the same time and vice versa
- Point to point configuration where a single master is able to transmit to a single client and vice versa

Baud Rates
- Supports the following baud rates:
  - 1200 bps
  - 2400 bps
  - 4800 bps
  - 9600 bps
  - 19200 bps
  - 38400 bps
  - 57600 bps
  - 115200 bps

Configuration Features
- Push-button on faceplate does the following:
  - Resets device to factory defaults
  - Autobauds device to match the baud rate of the attached serial device
  - Selects whether the device is a client or server
  - Selects Link Test mode, where a data sequence is transmitted from the server to the client
- LEDs:
  - Blue LED helps set up link test
  - Red LED illuminates when device has power
  - Green LED (TD) illuminates when data is transmitted
  - Yellow LED (RD) illuminates when data is received

Ordering Information

Click 400 900 MHz spread spectrum radio
CLK-400

ACCESSORIES
CLK-250 – Click 250 N-female to N-female bulkhead coaxial surge
100-0119 – 900 MHz 5 dBi omni antenna
100-0120 – 900 MHz 9 dBi Yagi antenna
100-0155 – 900 MHz/2.4 GHz 3 dBi omni low profile antenna

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Pocket PC & PC Configuration Software
- Comes with Click Supervisor, configuration software with the following features:
  - Runs on Pocket PC or Windows desktop or laptop PC (Windows XP and newer)
  - Configures serial communication settings including serial baud rates
  - Can remotely and directly upgrade the device firmware to add new features to the device
  - Can save/open a configuration to/from a file, allowing a common configuration to be easily programmed into many devices
  - Has customizable drivers that are stored in an XML file that describes the settings for a device as well the graphical user interface for that driver in the configuration software

Remote Upgradeability
- Flash memory can be remotely upgraded to add functionality to the firmware when new features have been developed to improve the performance of the installation

NEMA TS2-1998 Testing
- Complies with the applicable standards stated in the NEMA TS2-1998 Standard
- Test results available for each of the following tests:
  - Shock pulses of 10g, 11 ms half sine wave
  - Vibration of .5 Grms up to 30 Hz
  - 300 V positive/negative pulses applied at one pulse per second at minimum and maximum DC supply voltage
  - Stored at -49°F (-45°C) for 24 hours
  - Stored at 185°F (85°C) for 24 hours
  - Operation at -29.2°F (-34°C) and 10.8 VDC
  - Operation at -29.2°F (-34°C) and 26.5 VDC
  - Operation at 165.2°F (74°C) and 26.5 VDC
  - Operation at 165.2°F (74°C) and 10.8 VDC

Testing
- Passes manufacturer’s test before shipping

Extended Support
- Extended support options are available from Wavetronix; contact a Wavetronix representative for more information

Warranty
- One-year warranty against material and workmanship defect (see Click Warranty datasheet for complete details)
Click 400 Bid Specification

1.0 General. This item shall govern the purchase and installation of a serial to 900 MHz spread spectrum wireless module (SSWM) equivalent to the Wavetronix Click 400. Test results and other documentation demonstrating performance and capabilities shall be provided.

2.0 Product Description. The SSWM shall be a serial to spread spectrum wireless 900 MHz converter module for use with serial devices, such as the Wavetronix SmartSensor™. The SSWM shall convert serial communications (2-wire half duplex RS-485 and half duplex RS-232) to spread spectrum wireless 900 MHz communication, and vice versa; it shall also convert 2-wire half duplex RS 485 to half duplex RS-232 and vice versa.

3.0 Physical. The SSWM shall not exceed 0.2 lbs. (0.1 kg) in weight.

The SSWM shall not exceed 4.5 in. × 4 in. × 0.9 in. (11.4 cm x 10.2 cm x 2.3 cm) in its physical dimensions.

The SSWM shall operate in the temperature range of -29°F to 165°F (-34°C to 74°C).

4.0 Mounting. The SSWM shall mount to a DIN rail with hot-swappable, power and communication buses for quick installation and replacement.

5.0 Power. The SSWM shall operate using less than 1.6 W of average power when transmitting at 1000 mW with a duty cycle of 15% at 10VDC to 24VDC.

The SSWM shall have a power supply voltage of 10 to 30 VDC.

6.0 Connections. The SSWM shall include the following connections for power and communication:

6.1 Power. The SSWM shall include a 5-position connector, with two contact points reserved for connecting power through the bus.

6.2 RS-232. The SSWM shall feature a DB-9 connector for RS-232 communication.

6.3 RS-485. The SSWM shall feature a pluggable screw terminal for RS-485 communication. The 5-position connector shall have three contact points reserved for connecting RS-485 through the bus.

6.4 Wireless. The SSWM shall include one 900 MHz wireless communication connection port, which shall be accessed through a reverse polarized SMA male antenna connector.

7.0 Communication. The SSWM shall have the following communication capabilities:

7.1 Serial Protocol Conversion. The SSWM shall convert 2-wire half duplex RS-485 communication to half duplex RS-232 communication or vice versa. The WSCM module shall allow the user to communicate with a RVSD or any other device with a RS-232 connection.

7.2 Wireless. The SSWM shall allow wireless communications with any serial device by converting serial communications (2-wire half duplex RS-485 or half duplex RS-232) to spread spectrum wireless 900 MHz, and vice versa.

8.0 RF Specifications. The SSWM shall have:

- 32 different channels in the US
- 56 bit DES encryption
- 256 byte input and output buffer
- Operate 902–928 MHz frequency band using frequency hopping spread spectrum
- Adjustable transmitted RF power from 1mW to 743mW.
• -110dB receiver sensitivity in “Long Range” mode
• 20 mile range at full power with directional 6 dBi Yagi antenna
• Point to multipoint configuration where a single master is able to transmit the same data to multiple slaves at the same time and vice versa
• Point to point configuration where a single master is able to transmit to a single client and vice versa

9.0 Baud Rates. The SSWM shall support baud rates of 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps and 115200 bps.

10.0 Configuration Features. The SSWM shall have a push-button on the faceplate of the unit that:
• Resets the SSWM factory defaults
• Autobauds the SSWM to match the baud rate of the attached serial device
• Selects whether the SSWM is a client or server
• Selects a Link Test mode where a data sequence is transmitted from the server to the client

The front panel shall include a blue LED, which shall illuminate when a client SSWM is in range of a server on the same channel. The LED shall blink if the SSWM is set as a server.

The front of the SSWM shall include a red power LED, as well as green and yellow TX and RX LEDs that shall illuminate when corresponding data is successfully transmitted or received.

11.0 Pocket PC & PC Configuration Software. The SSWM shall be provided with configuration software that:
• Runs on both a Pocket PC and a Windows desktop or laptop PC (Windows XP and newer)
• Configures serial communication settings including serial baud rates
• Can remotely and directly upgrade the SSWM firmware to add new features to the SSWM
• Can save/open a configuration to/from a file. This allows a common configuration to be easily programmed into many devices.
• Has customizable drivers that are stored in an XML file that describes the settings for a device as well the Graphical User Interface for that driver in the configuration software.

12.0 Remote Upgradeability. The SSWM shall have flash memory that can be remotely upgraded to add functionality to the firmware when new features have been developed to improve the performance of the installation.

13.0 NEMA TS2-1998 Testing. The SSWM shall comply with the applicable standards stated in the NEMA TS2-1998 Standard. Test results shall be made available for each of the following tests:
• Shock pulses of 10g, 11 ms half sine wave
• Vibration of 0.5 Grms up to 30 Hz
• 300 V positive/negative pulses applied at one pulse per second at minimum and maximum DC supply voltage
• Cold temperature storage at -49°F (-45°C) for 24 hours
• High temperature storage at 185°F (85°C) for 24 hours
• Low temp, low DC supply voltage at ~29.2°F (-34°C) and 10.8 VDC
• Low temp, high DC supply voltage at ~29.2°F (-34°C) and 26.5 VDC
• High temp, high DC supply voltage at 165.2°F (74°C) and 26.5 VDC
• High temp, low DC supply voltage at 165.2°F (74°C) and 10.8 VDC

14.0 Testing. Before shipping, each SSWM shall have passed a manufacturer’s test.

15.0 Extended Support. Extended support options shall be available. Contact the manufacturer’s representative for more information.

16.0 Warranty. The SSWM shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
Bluetooth® to Serial Converter

The Click 421 converts half-duplex serial communications to Bluetooth® and vice versa. The convenience of Bluetooth® communication allows users to monitor sensors after installation is complete without physically connecting to the sensor or peripheral device.

**Features**

- Converts half-duplex serial communication to Bluetooth® and vice versa
- Autobauds to serial devices
- Includes two RS-232 communication ports and two RS-485 communication ports for device pass-through
- Uses either Bluetooth® or serial interface to configure the device
- Conformal coated
- Supports external antenna that can be installed outside the traffic cabinet or box for greater signal range
Technical Specifications

Physical
- Weight: 0.2 lbs (0.1 kg)
- Physical dimensions: 4.5 in. × 4 in. × 0.9 in. (11.4 cm × 10.2 cm × 2.3 cm)
- Ambient operating temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Mounting
- DIN rail-mountable
- Hot-swappable

Power
- Power supply voltage: 10 to 24 VDC
- Power consumption: 0.5 W

Connections
- Device has the following connection points:
  - Power: 5-position connector for connecting from the T-bus
  - RS-232: One pluggable screw terminal and a DB-9 connector
  - RS-485: 5-position connector for connecting from the T-bus as well as one pluggable screw terminal and an RJ-11 jack
  - Bluetooth® module
  - Supports an external antenna for Bluetooth® that can be installed on the exterior of a traffic cabinet or other installation for maximum signal range

Communication
- Converts RS-232 to RS-485 and vice versa
- Converts serial communication (RS-232 and RS-485) to Bluetooth®
  - Maximum line-of-sight distance: 330 ft (100 m) at maximum transmit power
  - Adjustable transmit power level: 2, 5, 12.5 or 32 mW
- 16-character alphanumeric personal identification number (PIN) security authentication secures the wireless link

Baud Rates
- Supports the following baud rates:
  - 1200 bps
  - 2400 bps
  - 4800 bps
  - 9600 bps
  - 19200 bps
  - 38400 bps
  - 57600 bps
  - 115200 bps

Configuration Features
- Push-button on faceplate does the following:
  - Resets device to factory defaults
  - Autobauds device to match the baud rate of the attached serial device
  - Selects Link Test mode, where the device transmits a data sequence that can be checked using a PC or Pocket PC
- LEDs:
  - Blue LED illuminates when Bluetooth® link is made
  - Red LED illuminates when device has power
  - Green LED (TD) illuminates when data is transmitted
  - Yellow LED (RD) illuminates when data is received

Pocket PC & PC Configuration Software
- Comes with Click Supervisor, configuration software with the following features:
  - Runs on Pocket PC or Windows desktop or laptop PC (Windows XP and newer)
  - Configures serial communication settings including serial baud rates
  - Can remotely and directly upgrade the device firmware to

Ordering Information

Click 421 Bluetooth® to serial converter
CLK-421

ACCESSORIES
CLK-250 – Click 250 N-female to N-female bulkhead coaxial surge
100-0202 – 2.4 GHz 2.5 dBi whip antenna
100-0141 – 2.4 GHz 12 dBi omni directional antenna
100-0155 – 900 MHz/2.4 GHz 3 dBi omni low profile antenna

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add new features to the device

- Can save/open a configuration to/from a file, allowing a common configuration to be easily programmed into many devices
- Has customizable drivers that are stored in an XML file that describes the settings for a device as well the graphical user interface for that driver in the configuration software

Remote Upgradeability

- Flash memory can be remotely upgraded to add functionality to the firmware when new features have been developed to improve the performance of the installation

NEMA TS2-1998 Testing

- Complies with the applicable standards stated in the NEMA TS2-1998 Standard
- Test results available for each of the following tests:
  - Shock pulses of 10g, 11 ms half sine wave
  - Vibration of .5 Grms up to 30 Hz
  - 300 V positive/negative pulses applied at one pulse per second at minimum and maximum DC supply voltage
  - Stored at -49°F (-45°C) for 24 hours
  - Stored at 185°F (85°C) for 24 hours
  - Operation at -29.2°F (-34°C) and 10.8 VDC
  - Operation at -29.2°F (-34°C) and 26.5 VDC
  - Operation at 165.2°F (74°C) and 26.5 VDC
  - Operation at 165.2°F (74°C) and 10.8 VDC

Testing

- Passes manufacturer’s test before shipping

Extended Support

- Extended support options are available from Wavetronix; contact a Wavetronix representative for more information

Warranty

- One-year warranty against material and workmanship defect (see Click Warranty datasheet for complete details)
Click 421 Bid Specification

1.0 General. This item shall govern the purchase and installation of a serial to Bluetooth® converter module (SBCM) equivalent to the Wavetronix Click 421. Test results and other documentation demonstrating performance and capabilities shall be provided.

2.0 Product Description. The SBCM shall be a serial to Bluetooth® converter module for use with serial devices, such as the Wavetronix SmartSensor™. The SBCM shall convert serial communications (2-wire half-duplex RS-485 and half-duplex RS-232) to Bluetooth® communication, and vice versa; it shall also convert 2-wire half-duplex RS-485 to half-duplex RS-232 and vice versa.

3.0 Physical. The SBCM shall not exceed 0.2 lbs. (0.1 kg) in weight.

The SBCM shall not exceed 4.5 in. × 4 in. × 0.9 in. (11.4 cm x 10.2 cm x 2.3 cm) in its physical dimensions.

The SBCM shall operate in the temperature range of -29°F to 165°F (-34°C to 74°C).

4.0 Mounting. The SBCM shall mount to a DIN rail with hot-swappable power and communication buses for quick installation and replacement.

5.0 Power. The SBCM shall operate using less than 0.5 W of average power at 10 VDC to 24 VDC.

6.0 Connections. The SBCM shall include the following connections for power and communication:

6.1 Power. The SBCM shall include a 5-position connector, with two contact points reserved for connecting power through the bus.

6.2 RS-232. The SBCM shall feature a DB-9 connector and a pluggable screw terminal for RS-232 communication.

6.3 RS-485. The SBCM shall feature a pluggable screw terminal for RS-485 communication. The 5-position connector shall have three contact points reserved for connecting RS-485 through the bus.

6.4 Bluetooth®. The SBCM shall include one Bluetooth® communication module.

The SBCM shall support an external antenna for Bluetooth® communications, which can be installed on the exterior of a traffic cabinet or other installation for maximum signal range.

7.0 Communication. The SBCM shall have the following communication capabilities:

7.1 Serial Protocol Conversion. The SBCM shall allow communications with any serial device that has a serial connection by converting 2-wire half-duplex RS-485 communication to half-duplex RS-232 communication, and vice versa.

7.2 Bluetooth. The SBCM shall allow communications with any serial device by converting serial communications (2-wire half-duplex RS-485 or half-duplex RS-232) to Bluetooth® communication, and vice versa.

The SBCM shall have a maximum line-of-sight distance of 100 m (330 ft) at maximum transmit power.

The SBCM shall have an adjustable transmit power level of 2 mW, 5 mW, 12.5 mW and 32 mW.

7.3 Security Authentication. The SBCM shall support a 16-character alphanumeric personal identification number (PIN) security authentication to secure the wireless link.

8.0 Baud Rates. The SBCM shall support baud rates of 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps, 57600 bps and 115200 bps.

9.0 Configuration Features. The SBCM shall have a push-button on the faceplate of the unit that:

• Resets to SBCM factory defaults
• Autobauds the SBCM to match the baud rate of the attached serial device
• Selects a Link Test mode where a data sequence is transmitted from the SBCM. The data sequence can be checked using a PC or Pocket PC

The front of the SBCM shall include a blue LED which shall illuminate when a Bluetooth® link is successfully made.

The front of the SBCM shall include a red power LED, as well as green and yellow TX and RX LEDs that shall illuminate when corresponding data is successfully transmitted or received.

10.0 Pocket PC & PC Configuration Software. The SBCM shall be provided with configuration software that:
• Runs on both a Pocket PC and a Windows desktop or laptop PC (Windows XP and newer)
• Configures serial communication settings including serial baud rates
• Can remotely and directly upgrade the SBCM firmware to add new features to the SBCM
• Can save/open a configuration to/from a file. This allows a common configuration to be easily programmed into many devices
• Has customizable drivers that are stored in an XML file that describes the settings for a device as well the Graphical User Interface for that driver in the configuration software

11.0 Upgradeability. The SBCM shall have flash memory that can be remotely upgraded to add functionality to the firmware when new features have been developed to improve the performance of the installation.

12.0 NEMA TS2-1998 Testing. The SBCM shall comply with the applicable standards stated in the NEMA TS2-1998 Standard. Test results shall be made available for each of the following tests:
• Shock pulses of 10g, 11 ms half sine wave
• Vibration of 0.5 Grms up to 30 Hz
• 300 V positive/negative pulses applied at one pulse per second at minimum and maximum DC supply voltage
• Cold temperature storage at -49°F (-45°C) for 24 hours
• High temperature storage at 185°F (85°C) for 24 hours
• Low temp, low DC supply voltage at -29.2°F (-34°C) and 10.8 VDC
• Low temp, high DC supply voltage at -29.2°F (-34°C) and 26.5 VDC
• High temp, high DC supply voltage at 165.2°F (74°C) and 26.5 VDC
• High temp, low DC supply voltage at 165.2°F (74°C) and 10.8 VDC

13.0 Testing. Before shipping, each SBCM shall have passed a manufacturer’s test.

14.0 Extended Support. Extended support options shall be available. Contact the manufacturer’s representative for more information.

15.0 Warranty. The SBCM shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.