Surge protector

The Click 200 has a three-stage surge suppression design that protects SmartSensor sensors and traffic cabinets from power surges over DC power and serial communication lines.

- Multi-stage surge protection for RS-485, RS-232, and DC power
- Convenient, hot-swappable power and communication buses
- Includes unprotected communication connectors
- Protects traffic monitoring devices, such as sensors or cameras, as well as traffic cabinets
- Pluggable screw terminals minimize problems caused by incorrect wiring
- Designed for use with all other Click devices
- DIN rail–mounted for easy installation
- Complies with NEMA TS2-1998 environmental testing
- Complies with IEC/EN 61000-4-5 level 4
- Conformal coated
Technical specifications

Physical
- Weight: 0.3 lbs (0.14 kg)
- Physical dimensions: 4.5 in. × 4 in. × 0.9 in. (11.4 cm x 10.2 cm x 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

Connections
- Screw terminals for power and communication
- Screw terminals are pluggable for easy pre-wiring
- Screw terminals compatible with 12 AWG or smaller wires
- Other ports:
  - DB-9 connector for RS-232 communication
  - RJ-11 connector for RS-485 communication
  - 5-position connector for power and RS-485 to and from the T-bus

Multi-stage surge protection
- DC power
  - Clamping voltage: 28 VDC
- RS-485
  - Clamping voltage: 8 VDC
  - Differential clamping voltage: 12 VDC
- RS-232 with CTS/RTS protection
  - Clamping voltage: 11 VDC

NEMA TS2-1998 testing
- Complies with the applicable standards stated in the NEMA TS2-1998 standard
  - Shock pulses of 10 g, 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 AC 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 89 VAC
  - Operation at -29.2°F (-34°C) and 135 VAC
  - Operation at 165.2°F (74°C) and 135 VAC
  - Operation at 165.2°F (74°C) and 89 VAC

FCC testing
- FCC-compliant

Ordering information

Click 200
CLK-200

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Testing
- Passes manufacturer’s test before shipping

Surge immunity
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

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

1.0 General. This item shall govern the purchase and installation of a surge protection device ( SPD) equivalent to the Wavetronix Click 200. Test results and other documentation demonstrating performance and capabilities shall be provided.

2.0 Product description. The SPD shall suppress electrical surges up to 4 kV on DC power lines, RS-485, and RS-232 with CTS/RTS communication lines to any device connected to the SPD. The SPD shall be designed to protect a radar vehicle sensing device (RSVD) equivalent to the Wavetronix SmartSensor from surges coming from a traffic cabinet, or protect a cabinet from surges coming from the RVSD.

3.0 Physical. The SPD shall not exceed 0.3 lbs. (0.14 kg) in weight.

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

The SPD shall operate in humidity up to 95% RH.

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

5.0 Connections. The SPD shall have pluggable screw terminals, compatible with 12 AWG or smaller wires, allowing the user to wire a contact closure data collector to the SPD before installation to make installation easy and to minimize incorrect wiring.

The SPD shall also have a protected DB-9 connector for the RS-232DTE with CTS/RTS communication bus.

The SPD shall also have a protected RJ-11 connector for the RS-485 communication bus.

The SPD shall also have a 5-position connector for connecting power and RS-485 communications to and from the T-bus.

6.0 Surge protection. The SPD shall have a two-stage power surge suppression design. The first stage shall be gas tubes followed by a second stage using inductors and TVS diodes.

The SPD shall have a three-stage communications surge suppression design. The first stage shall be gas tubes followed by a second stage using resistors and TVS diodes. The third stage shall have resistors and MOVs.

7.0 DC power protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 Standard for DC power lines. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV, and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20µs waveform
- 2 ohm generator impedance
- Minute-long pause between surges

8.0 RS-485 protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 Standard for communication lines. The RS-485 communication bus shall have a clamping voltage of 8 VDC and a 12 VDC differential clamping voltage. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV, and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20µs waveform
- 12 ohm generator impedance
- Minute-long pause between surges
9.0 RS-232 with CTS/RTS protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 Standard for communication lines. The RS-232 communication bus shall have a clamping voltage of 11 VDC. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV, and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20µs waveform
- 12 ohm generator impedance
- Minute-long pause between surges

10.0 NEMA TS2-1998 testing. The SPD 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:

- 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

11.0 Testing. Each SPD shall be tested by the manufacturer before shipment.

Each SPD shall comply with all CE requirements under IEC 60950-1.

12.0 Warranty. The SPD shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
AC to DC power converter

The Click 201, 202, and 204 are 100 to 240 VAC to 24 VDC power converters, bringing reliable DC power to your traffic cabinet. With a 100% power reserve, the Click 201, 202, and 204 are the most effective remedy for static voltage dips, transient failures of supply voltage or continuous phase failures.

- Converts 100–240 VAC power to 24 VDC power
- Provides 1, 2, or 4 A of current, depending on model
- Mounts easily onto a DIN rail
- Meets NEMA TS2-1998 environmental specification
- UL listed
- Pluggable screw terminals allow for easier wiring and are red-keyed, allowing connectors to plug into only one specific jack
- Guaranteed mains buffering of more than 20 ms under full load
- DC OK LED indicates when device is working properly
- Features internal surge protection
- Potentiometer allows for adjustable DC voltage output
- Comes in three models:
  - Click 201: 1 A @ 24 VDC
  - Click 202: 2 A @ 24 VDC
  - Click 204: 4 A @ 24 VDC
Technical specifications

Physical
- Weight: 0.46 lbs. (0.21 kg) / 0.55 lbs. (0.25 kg) / 1.1 lbs. (0.48 kg)
- Physical dimensions: 4.5 in. × 3.9 in. × 0.9 in. (11.4 cm x 9.9 cm x 2.3 cm) / 4.5 in. × 3.9 in. × 1.7 in. (11.4 cm x 9.9 cm x 4.3 cm) / 4.2 in. × 3.9 in. × 2.7 in. (10.7 cm x 9.9 cm x 6.8 cm)
- Ambient operating temperature: -29°F to 140°F (-34°C to 60°C) with between 140°F and 165°F (60°C and 74°C) derating
- Humidity: up to 95% RH

Mounting
- DIN rail–mountable

Connections
- Pluggable screw terminals for easy pre-wiring

Power
- Click 201 power output at -29°F to 140°F (-34°C to 60°C): 1 A
- Click 202 power output at -29°F to 140°F (-34°C to 60°C): 2 A
- Click 204 power output at -29°F to 140°F (-34°C to 60°C): 4 A
- At temperatures between 140°F to 165°F (60°C and 74°C), output will decrease at a rate of 2.5% per degree Celsius temperature increase
- Click 201/202/204 power input: 100–240 VAC at 45–65 Hz

Surge protection
- Complies with the applicable standards stated in the IEC 61000-4-5 Standard for AC input power lines

Efficiency
- Efficiency in converting AC input to DC: 80% or greater

UL listed
- Listed with UL under UL 508; complies with all applicable UL 508 standards.

NEMA TS2-1998 testing
- Click 201/202 comply with the applicable standards stated in the NEMA TS2-1998 Standard
- Test results available for each of the following tests for the Click 201/202:
  - 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

Ordering information

Click 201
CLK-201
Click 202
CLK-202
Click 204
CLK-204

Accessories
WX-CLK-210 – Click 210 circuit breaker
WX-CLK-230 – Click 230 AC surge protector

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Testing
- Device is tested by the manufacturer before shipment
- Tested under NEMA TS2-2003

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)
Bid specifications

1.0 General. This item shall govern the purchase and installation of 120–240 VAC to 24 VDC 1, 2 and 4 A power supplier (PS) equivalent to the Wavetronix Click 201, 202 and 204 respectively. Test results and other documentation demonstrating performance and capabilities shall be provided.

2.0 Product description. The PS provides a regulated 24 VDC output from a 120–240 VAC input of 1 A (Click 201), 2 A (Click 202) or 4 A (Click 204).

3.0 Physical. The 1 A PS shall not exceed 0.46 lbs. (0.21 kg) in weight. The 2 A PS shall not exceed 0.55 lbs. (0.25 kg) in weight. The 4 A PS shall not exceed 1.1 lbs. (0.48 kg) in weight.

The 1 A PS shall not exceed 4.5 in. × 3.9 in. × 0.9 in. (11.4 cm x 9.1 cm x 2.3 cm) in its physical dimensions. The 2 A PS shall not exceed 4.5 in × 3.9 in. × 1.7 in. (11.4 cm x 9.1 cm x 4.3 cm). The 4 A PS shall not exceed 4.2 in. × 3.9 in. × 2.7 in. (10.7 cm x 9.9 cm x 6.8 cm).

The PS shall operate in the temperature range of -29°F to 140°F (-34°C to 60°C), with between 140°F and 165°F (60°C and 74°C) derating.

The PS shall operate in humidity up to 95% RH.

4.0 Mounting. The PS shall mount to a DIN rail.

5.0 Connections. The PS shall have pluggable screw terminals allowing the user to wire input and output of the AC/DC power supply before installation to make installation easy and to minimize incorrect wiring.

6.0 Power. The 1 A PS shall supply 1 A of current when the operating temperature is from -29°F to 140°F (-34°C to 60°C). The 2 A PS shall supply 2 A of current when the operating temperature is from -29°F to 140°F (-34°C to 60°C). The 4 A PS shall supply 4 A of current when the operating temperature is from -29°F to 140°F (-34°C to 60°C).

At temperatures between 140°F to 165°F (60°C and 74°C), output shall decrease at a rate of 2.5% per degree Celsius temperature increase to prevent device from becoming overheated.

The PS shall accept inputs from 100 to 240 VAC at frequency of 45 to 65 Hz.

7.0 Surge protection. The PS shall comply with the applicable standards stated in the IEC 61000-4-5 Standard for AC input power lines.

8.0 Efficiency. The PS shall have an efficiency of 80% or greater when converting AC input to DC.

9.0 UL listed. The PS shall be listed with UL under UL 508 and comply with all applicable UL 508 standards.

10.0 NEMA TS2-1998 testing. The 1 A PS and the 2 A PS shall comply with the applicable standards stated in NEMA TS2-1998. Test results shall be made available for these two devices for each of the following tests:

- Shock pulses of 10g, 11 ms half sine wave
- Vibration of 0.5 G rms 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

11.0 Testing. Each PS shall be tested by the manufacturer before shipment.

The PS shall comply with the applicable standards stated in the NEMA TS2-2003 Standard.

12.0 Extended support. Extended support options shall be available. Contact the manufacturer representative for more information.

13.0 Warranty. The PS shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
AC circuit breaker

The Click 210 is a compact circuit breaker DIN rail device designed to interrupt an electric current under overload conditions. Use this module as part of the power setup in your traffic cabinet to protect your traffic monitoring devices.

- Trip-free breaker can be easily reset after a current interruption by pushing the reset button
- Mounts on DIN rail
- Features hot-swappable circuit breaker fuse
- Circuitry is located in removable head, so if the module stops working, only the head needs to be replaced
- Module has life expectancy of 3000 cycles @ 0.5 A
- Integrated ON/OFF switching function enables you to switch the circuit breaker back on immediately after triggering
- Protection type according to IEC 529/EN 60 529: IP 20
- Rated surge voltage of 2.5 kV
- Interrupting capacity of 2000 A
- Available in three models
  - Click 210: 0.5 A
  - Click 210-02: 2 A
  - Click 210-10: 10 A
Technical specifications

Physical
- Weight: 0.07 lbs. (31.8 g)
- Physical dimensions: 0.3 in. x 2.5 in. x 3.4 in. (0.08 cm x 6.4 cm x 8.6 cm)
- Ambient operating temperature: -4°F to 140°F (-20°C to 60°C)

Mounting
- DIN rail–mountable

Power
- Nominal operating voltage: 250 VAC, 65 VDC
- Nominal current:
  - Click 210: 0.5 A
  - Click 210-02: 2 A
  - Click 210-10: 10 A

Connections
- Two screw terminals for wiring in and out

Configuration feature
- Push-button used to reset device after a current interruption

Fuse
- Slow-blow fuse

Switching capacity
- Switching capacity: 6x IN for nominal currents 0.25 A to 4 A, 8x IN for nominal currents 6 A to 10 A

Life expectancy
- Life expectancy: 3000 cycles

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)

Ordering information

Click 210
CLK-210
Click 210
CLK-210-02
Click 210
CLK-210-10

Accessories
CLK-230 – Click 230 AC surge protector

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com
Bid specifications

1.0 General. This item shall govern the purchase and installation of a circuit breaker module (CBM) equivalent to the Wavetronix Click 210.

2.0 Product description. The CBM is a compact circuit breaker designed to interrupt an electric current under overload conditions. The breaker is available to handle ten nominal currents ranging from 0.10 A to 10 A. The CBM breaker is trip-free and can be easily reset after a current interruption by pushing the reset button.

3.0 Physical. The CBM shall not exceed 0.07 lbs. (31.8 g) in weight.

The CBM shall not exceed 0.3 in. x 2.5 in. x 3.4 in. (0.08 cm x 6.4 cm x 8.6 cm) in its physical dimensions.

The CBM shall operate continuously over a temperature range of -4°F to 140°F (-20°C to 60°C).

4.0 Mounting. The CBM shall mount to a DIN rail for quick installation and replacement.

5.0 Power. The CBM shall have a nominal operating voltage of 250 VAC; models shall be available with a current of 0.5 A, 2 A or 8 A.

6.0 Connections. The CBM shall feature two screw terminal connections, one on each end, for wiring power in and out.

7.0 Configuration feature. The CBM shall have a push-button for resetting the device after a current interruption.

8.0 Fuse. The Click 210 shall feature a slow-blow fuse.

9.0 Switching capacity. The CBM shall have a switching capacity of 6x IN for nominal currents 0.25 A to 4 A and 8x IN for nominal currents 6 A to 10 A.

10.0 Life expectancy. The CBM shall have a life expectancy of 3000 cycles at 0.5 A.

11.0 Testing. The CBM shall have been tested by the manufacturer before shipping.

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

13.0 Warranty. The CBM shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
DC surge protector

The Click 221 has a three-stage surge suppression design that protects sensors and traffic cabinets from power surges over DC power lines. It mounts quickly and easily onto a DIN rail and ensures clean power on the T-bus.

- Multi-stage surge protection for DC power
- Protects traffic monitoring devices, such as sensors or cameras, as well as traffic cabinets
- Hot-swappable and mounts on DIN rail for quick and easy installation
- Quick-mount grounding foot provides easy connection and high-performance ground
- DC Present / Protection OK LED
- Pluggable screw terminal minimizes problems caused by incorrect wiring
- Maximum working voltage of 28 V and maximum continuous operating current of 8 A
- Conformal coated
- Complies with NEMA TS2-1998 environmental testing
- Complies with IEC/EN 61000-4-5 level 4

www.wavetronix.com
Technical specifications

Physical
- Weight: 0.4 lbs. (0.2 kg)
- Physical dimensions: 4.5 in. × 4 in. × 0.9 in. (11.4 cm x 10.2 cm x 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 ratings
- Maximum working voltage: 28 V
- Maximum continuous operating current: 8 A

Connections
- Four screw terminal connections
  - DC+
  - DC-
  - Two protective earth
- 5-position connector for connecting power from the T-bus

Configuration feature
- LED for monitoring power and surge protection status
  - Indicates that DC power is present, that the polarity is correct, and that the MOV protection devices are functioning correctly

Multi-stage surge protection
- DC power
  - Clamping voltage: 28 VDC

NEMA TS2-1998 testing
- Complies with the applicable standards stated in the NEMA TS2-1998 Standard
  - Shock pulses of 10 g, 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 AC 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 89 VAC
  - Operation at -29.2°F (-34°C) and 135 VAC
  - Operation at 165.2°F (74°C) and 135 VAC
  - Operation at 165.2°F (74°C) and 89 VAC

FCC testing
- FCC-compliant

Ordering information

Click 221
CLK-221

Accessories
CLK-210 – Click 210 AC circuit breaker

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com

Testing
- Passes manufacturer’s test before shipping

Surge immunity
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

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

1.0 General. This item shall govern the purchase and installation of a 24 VDC surge protection device (SPD) equivalent to the Wavetronix Click 221.

2.0 Product description. The SPD shall provide surge protection on DC power lines through the use of MOV protection devices, inductors, and TVS diodes, with a LED turn-on in case of failure.

3.0 Physical. The SPD shall not exceed 0.4 lbs. (0.2 kg) in weight.

The SPD 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 SPD shall operate continuously over a temperature range of -29°F to 165°F (-34°C to 74°C).

4.0 Mounting. The SPD shall mount to a DIN rail for quick installation and replacement. It shall be hot-swappable.

5.0 Power ratings. The SPD shall have a maximum working voltage of 28 VDC and a maximum continuous operating current of 8 A.

6.0 Connections. The SPD shall have four screw terminal connections: one for DC+, one for DC-, and two for protective earth.

7.0 Configuration feature. The SPD shall have an LED for monitoring power and surge protection status. This LED shall indicate that DC power is present, that the polarity is correct, and that the MOV protection devices are functioning correctly.

8.0 Surge protection. The SPD shall provide three-stage surge protection, consisting of a MOV/gas tube hybrid first state, and inductors and TVS diodes for the second and third stages.

The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 standard for DC power lines.

Test results shall be available for the SPD for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV, and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20μs waveform
- 2 ohm generator impedance
- Minute-long pause between surges

9.0 NEMA TS2-1998 testing. The SPD shall comply with the applicable standards stated in the NEMA TS2-1998 level 4 Standard. Test results shall be made available for each of the following tests:

- 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

10.0 Testing. Before shipping, each SPD shall have passed a manufacturer’s test.

11.0 Warranty. The SPD shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
System surge protector

The Click 222 system surge protection device is designed to prevent electrical surges conducted along underground cables from damaging the cabinet equipment. The device features a control bridge that connects electrically isolated RS-485 buses, eliminating communication problems caused by star networks.

- Multi-stage surge protection for RS-485 and DC power
- Low capacitance RS-485 protection
- Protects traffic monitoring devices and traffic cabinets
- Designed for use with all Click devices
- DIN rail–mounted for easy installation
- Convenient, hot-swappable power and communication buses
- Electrically isolates RS-485 buses for better communication
- Complies with IEC/EN 61000-4-5 level 4
- Conformal coated
- Pluggable screw terminals minimize problems caused by incorrect wiring
- LEDs indicate power, surge protection status, and data transmission/receipt
- Complies with NEMA TS2-1998 environmental testing
Technical specifications

Physical
- Weight: 0.35 lbs (0.15 kg)
- Physical dimensions: 4.5 in. × 4 in. × 0.9 in. (11.4 cm x 10.2 cm x 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
- Operates using 0.3 W of average power at 24 VDC

Connections
- Pluggable screw terminals for easy pre-wiring:
  - 1 pair for DC power
  - 2 terminals for protective earth
  - 4 pairs for RS-485 communication (485A, 485B, 485C, 485D)
- 3 RJ-11 jacks for connecting to detector rack cards:
  - One connected to 485A
  - One connected to 485B
  - One connected to 485C and 485D
- 5-position connector for power and RS-485 to and from the T-bus

Communications
- Routes RS-485 communications between screw terminals, 5-position connector, and RJ-11 jacks
- RJ-11 jacks labeled RS-485 A and RS-485 B send contact closure information to rack cards
- RJ-11 jack labeled RS-485 Bridge connects to the device’s control bridge, which electrically isolates RS-485 buses connected to it for more reliable communication; also connected to T-bus

Multi-stage surge protection
- DC Power
  - Clamping voltage: 28 VDC
- RS-485
  - Clamping voltage: 8 VDC
  - Differential clamping voltage: 12 VDC

NEMA TS2-1998 testing
- Complies with the applicable standards stated in the NEMA TS2-1998 Standard
  - Shock pulses of 10 g, 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 AC supply voltage
  - Stored at -49°F (-45°C) for 24 hours

Ordering information

Click 222
CLK-222

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com

- Stored at 185°F (85°C) for 24 hours
- Operation at -29.2°F (-34°C) and 89 VAC
- Operation at -29.2°F (-34°C) and 135 VAC
- Operation at 165.2°F (74°C) and 135 VAC
- Operation at 165.2°F (74°C) and 89 VAC

FCC testing
- FCC-compliant

Testing
- Passes manufacturer’s test before shipping

Surge immunity
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

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

1.0 General. This item shall govern the purchase and installation of a system surge protector device (SPD) equivalent to the Wavetronix Click 222. Test results and other documentation demonstrating performance and capabilities shall be provided.

2.0 Product description. The SPD shall suppress electrical surges conducted along underground cables, protecting the power and RS-485 serial connections on the device from these incoming surges. The SPD shall be designed to protect a radar vehicle sensing device (RVSD) equivalent to the Wavetronix SmartSensor™ from surges coming from a traffic cabinet, or protect a cabinet from surges coming from the RVSD.

3.0 Physical. The SPD shall not exceed 0.35 lbs. (0.15 kg) in weight.

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

The SPD shall operate in humidity up to 95% RH.

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

5.0 Power. The SPD shall operate using 0.3 W of average power at 24 VDC.

6.0 Connections. The SPD shall have pluggable screw terminals to make installation easy and to minimize incorrect wiring. The screw terminals shall consist of one pair of terminals for DC power, one for protective earth, and four pairs for RS-485 communications.

The SPD shall also have 3 RJ-11 connectors for RS-485 communication. One shall be connected to the first pair of RS-485 screw terminals, one shall be connected to the second pair, and the third shall be connected to both the third and fourth pairs.

The SPD shall also have a 5-position connector for connecting power and RS-485 communications to and from the T-bus.

7.0 Communications. The SPD shall pass RS-485 communications between its screw terminals, 5-position connect, and RJ-11 jacks.

The SPD’s RJ-11 jacks shall have the following functions: the first shall send data to a contact closure device from the RVSD connected to the first pair of RS-485 screw terminals. The second shall send data to a contact closure device from the RVSD connected to the second pair of RS-485 screw terminals. The third shall connect from the final two pairs of RS-485 screw terminals to a control bridge; this bridge shall electrically isolate the RS-485 buses connected to it for more reliable communications. This jack shall also connect to the T-bus.

8.0 Three-stage protection. The SPD shall have a three-stage surge suppression design. The first stage shall be gas tubes. The second and third stages shall both consist of inductors and TVS diodes (for the power lines) or resistors and TVS diodes (for the communication lines).

9.0 DC power protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 standard for DC power lines. The SPD shall have a maximum working voltage of 28 V. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20μs waveform
- 2 ohm generator impedance
- Minute-long pause between surges

10.0 RS-485 protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 Standard for communication lines. The RS-485 communication bus shall have a maximum working voltage of 5 V. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20µs waveform
- Minute-long pause between surges

11.0 Testing. Each SPD shall be tested by the manufacturer before shipment.

Each SPD shall comply with the applicable standards stated in the NEMA TS2-2003 Standard.

12.0 Warranty. The SPD shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
Dual-485 surge protector

The Click 223 provides surge protection for one DC power line and two RS-485 lines. Use this device with your installation to protect your equipment from surges coming in on cables, such as those caused by lightning striking near underground cable runs.

- Multi-stage surge protection for RS-485 and DC power
- Low capacitance RS-485 protection
- Protects traffic monitoring devices and traffic cabinets
- Designed for use with all Click devices
- DIN rail–mounted for easy installation
- Convenient, hot-swappable power and communication buses
- Pluggable screw terminals minimize problems caused by incorrect wiring
- Has two electrically isolated RS-485 buses
- LED indicates power and surge protection status
- Conformal coated
- Complies with NEMA TS2-1998 environmental testing
- Complies with IEC/EN 61000-4-5 level 4

![Click 223 Diagram]

**Connector Diagram:**
- T-Bus Connector
- Power Connector
- RS-485 A Connector
- RS-485 B Connector
- Surge OK LED

**Diagram Notes:**
- TOP View
- FRONT View

**Additional Information:**
- 78 E 1700 S, Provo, UT 84606, US • (801) 734-7200 • www.wavetronix.com
- WX-500-0165
Technical specifications

Physical
- Weight: 0.375 lbs (0.17 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 temperature: -29°F to 165°F (-34°C to 74°C)
- Humidity: up to 95% RH

Mounting
- DIN rail–mountable
- Hot-swappable

Connections
- Pluggable screw terminals for easy pre-wiring:
  - 1 pair for DC power
  - 6 terminals for protective earth
  - 2 pairs for RS-485 communication (485A, 485B)
- 2 RJ-11 jacks for connecting to detector rack cards:
  - One connected to 485A
  - One connected to 485B
- 5-position connector for power and RS-485 to and from the T-bus

Communications
- Routes RS-485 communications between screw terminals, 5-position connector, and RJ-11 jacks
- RJ-11 jack labeled RS-485 A sends contact closure information to rack cards and communicates with screw terminals marked 485A and with T-bus
- RJ-11 jack labeled RS-485 B sends contact closure information to rack cards and communicates with screw terminals marked 485B

Multi-stage surge protection
- DC Power
  - Clamping voltage: 28 VDC
- RS-485
  - Clamping voltage: 8 VDC
  - Differential clamping voltage: 12 VDC

NEMA TS2-1998 testing
- Complies with the applicable standards stated in the NEMA TS2-1998 Standard
  - Shock pulses of 10 g, 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 AC 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 89 VAC
  - Operation at -29.2°F (-34°C) and 135 VAC
  - Operation at 165.2°F (74°C) and 135 VAC
  - Operation at 165.2°F (74°C) and 89 VAC

FCC testing
- FCC-compliant

Testing
- Passes manufacturer’s test before shipping

Surge immunity
- Surge immunity sensor ports: IEC/EN 61000-4-5 level 4

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

Ordering information

Click 223
CLK-223

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com
Bid specifications

1.0 General. This item shall govern the purchase and installation of a system surge protector device (SPD) equivalent to the Wavetronix Click 223. Test results and other documentation demonstrating performance and capabilities shall be provided.

2.0 Product description. The SPD shall suppress electrical surges conducted along underground cables, protecting the power and RS-485 serial connections on the device from these incoming surges. The SPD shall be designed to protect a radar vehicle sensing device (RVSD) equivalent to the Wavetronix SmartSensor from surges coming from a traffic cabinet, or protect a cabinet from surges coming from the RVSD.

3.0 Physical. The SPD shall not exceed 0.375 lbs. (0.17 kg) in weight.

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

The SPD shall operate in humidity up to 95% RH.

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

5.0 Connections. The SPD shall have pluggable screw terminals to make installation easy and to minimize incorrect wiring. The screw terminals shall consist of one pair of terminals for DC power, six terminals for protective earth, and two pairs for RS-485 communications.

The SPD shall also have 2 RJ-11 connectors for RS-485 communication. One shall be connected to the first pair of RS-485 screw terminals and the other shall be connected to the second pair.

The SPD shall also have a 5-position connector for connecting power and RS-485 communications to and from the T-bus.

6.0 Communications. The SPD shall pass RS-485 communications between its screw terminals, 5-position connect, and RJ-11 jacks.

The SPD’s RJ-11 jacks shall have the following functions: the first shall send data to a contact closure device from the RVSD connected to the first pair of RS-485 screw terminals; this jack shall also connect to the T-bus. The second shall send data to a contact closure device from the RVSD connected to the second pair of RS-485 screw terminals.

7.0 Three-stage protection. The SPD shall have a three-stage surge suppression design. The first stage shall be gas tubes. The second and third stages shall both consist of inductors and TVS diodes (for the power lines), or resistors and TVS diodes (for the communication lines).

8.0 DC power protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 standard for DC power lines. The SSP shall have a maximum working voltage of 5 V. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV, and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20µs waveform
- 2 ohm generator impedance
- Minute-long pause between surges

9.0 RS-485 protection. The SPD shall comply with the applicable standards stated in the IEC 61000-4-5 level 4 Standard for communication lines. The RS-485 communication bus shall have a maximum working voltage of 5 V. Test results shall be made available for the following test conditions:

- Surge voltages ±0.5kV, 1kV, 2kV, and 4kV
- Common mode (input to ground)
- Differential mode (input to input)
- 8x20µs waveform
• 2 ohm generator impedance
• Minute-long pause between surges

10.0 Testing. Each SPD shall be tested by the manufacturer before shipment.

11.0 Warranty. The SPD shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
AC surge protector

The Click 230 provides AC surge protection for traffic cabinet components as part of your power supply. It mounts quickly and easily onto a DIN rail and provides up to to 10 kA (8/20μS) of surge protection per AC input line.

- Protection achieved through the use of tightly coordinated hybrid circuits
- Three-stage surge protection:
  - Fast-responding surge-arresting diodes
  - High-powered current-handling gas discharge tubes
  - Series decoupling elements
- Features fault signaling
- Remote indication contact
- Mounts on DIN rail for quick and easy installation
- Pluggable suppression can be hot-swapped for verification testing
- Quick-mount grounding foot provides easy connection and high-performance ground
- Approvals: UL 497B, UL 1604
- Comes in two models:
  - Click 230: 120 VAC
  - Click 230-02: 230 VAC
Technical specifications

Physical
- Weight: 0.2 lbs. (0.1 kg)
- Physical dimensions: 0.7 in. X 2.6 in. X 3.5 in. (1.8 cm x 6.6 cm x 8.9 cm)
- Ambient operating temperature: -40°F to 185°F (-40°C to 85°C)

Mounting
- DIN rail-mountable

Power ratings
- Nominal operating voltage:
  - Click 230: 120 VAC
  - Click 230-02: 230 VAC
- Nominal current In: 26 A
- Maximum continuous operating voltage: 150 VAC (Click 230), 253 VAC (Click 230-02)
- Maximum discharge current (8/20μS): 10 kA

Connections
- Has eight screw terminal connections:
  - Line, neutral and ground out
  - Line, neutral and ground in
  - Two testing terminals

Surge protection
- Three-stage surge protection:
  - Fast-responding surge-arresting diodes
  - High-powered current-handling gas discharge tubes
  - Series decoupling elements

Testing
- Passes manufacturer’s test before shipping
- Tested under NEMA TS2-2003

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 Extended Warranty datasheet for complete details)

Ordering information

Click 230
CLK-230

Click 230
CLK-230-02

Accessories
CLK-210 – Click 210

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com
Bid specifications

1.0 General. This item shall govern the purchase and installation of a surge suppression module (SSMAC) rated for 120 VAC or 230 VAC, equivalent to the Wavetronix Click 230 or 230-02, respectively.

2.0 Product description. The SSMAC shall provide surge protection on AC power lines through the use of primarily an MOV circuit as with MOV failure disconnect with remote and local indication with a LED turn-on in case of failure.

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

The SSMAC shall not exceed 0.7 in. x 2.6 in. x 3.5 in. (1.8 cm x 6.6 cm x 8.9 cm) in its physical dimensions.

The SSMAC shall operate continuously over a temperature range of -40°F to 185°F (-40°C to 85°C).

4.0 Mounting. The SSMAC shall mount to a DIN rail for quick installation and replacement.

5.0 Power ratings. Depending on the model, the SSMAC shall have a nominal operating voltage of 120 VAC or 230 VAC and a current of 26 A.

The 120 VAC SSMAC shall have a maximum continuous operating voltage of 150 VAC. The 230 VAC SSMAC shall have a maximum continuous operating voltage of 253 VAC.

The SSMAC shall have a maximum discharge current (8/20μS) of 10 kA.

6.0 Connections. The SSMAC shall have eight screw terminal connections: three for wiring line, neutral, and ground in; three for wiring the same out; and two for testing.

7.0 Surge protection. The SSMAC shall provide three-stage surge protection, consisting of fast-responding surge-arresting diodes, high-powered current-handling gas discharge tubes, and series decoupling elements.

8.0 Testing. Before shipping, each SSMAC shall have passed a manufacturer's test.

The SSMAC shall comply with the applicable standards stated in the NEMA TS2-2003 Standard.

9.0 Extended support. Extended support options shall be available. Contact the manufacturer's representative for more information.

10.0 Warranty. The SSMAC shall be warranted to be free from material and workmanship defects for a period of one year from date of shipment.
Wireless surge protector

The Click 250 is a 100 MHz–3 GHz 90 V coaxial wireless surge protector. The ultra-fast gas discharge tube design gives quick response to power surges and dumps the excess power safely to ground.

- Ideal for IEEE 802.11b and 802.11g wireless LAN applications, as well as ISM, MMDS, and cellular and PCS applications
- Passes DC power
- Bulkhead N-female to N-female connector
- Both connector ports are equally protected
- Ground lug and terminal are located directly on the housing of the device
- Bi-directional protection
- Easily replaced gas tube element
- Multi-strike capability

Features rubber O-ring seal
Fast response time
Technical specifications

Physical
- Weight: 0.2 lbs. (0.09 kg)
- Physical dimensions: 3.2 in. x 1.6 in. x 0.8 in. (8.2 cm x 4 cm x 2 cm)
- Ambient operating temperature: -67°F to 185°F (-55°C to 85°C)
- Body and bracket material: aluminum
- Pin material: gold-plated brass
- Max. panel thickness (bulkhead connector): 0.3 in. (0.7 cm)

Mounting
- Mounts through cabinet wall
- Features rubber O-ring seal

Electrical
- Passes DC power
- Frequency range: 0–3 GHz
- Protector complies with IEC/IEEE standard
- Impedance: 50 ohm
- Maximum discharge current: 5 kA

Connections
- Connectors type: N-female to N-female bulkhead
- Connector body material: nickel-plated brass
- Connectors comply with MIL-C-71A, 39012 standard

Testing and standards
- Complies with the following environmental specifications:
  - Dust and waterproof rating: IEC 529 / IP65
  - Moisture resistance: MIL-STD-202 Method 106D
  - Salt fog: MIL-STD-202 101D/B
  - Vibration: MIL-STD-202 Method 204D/B
  - Shock: MIL-STD-202 Method 213B/A
  - RoHS Compliant

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)

Ordering information

Click 250
CLK-250

Accessories
- 100-0119 – 900 MHz 5 dBi omni antenna
- 100-0120 – 900 MHz 9 dBi omni antenna
- 100-0141 – 2.4 GHz 12 dBi omni antenna

Contact us
801.734.7200
sales@wavetronix.com
www.wavetronix.com

1 of 3
Bid specifications

1.0 General. This item shall govern the purchase and installation of a wireless surge suppression module (WSSM) equivalent to the Wavetronix Click 250.

2.0 Product description. The WSSM shall provide surge protection on a coaxial cable going between a wireless communication module and an external antenna.

3.0 Physical. The WSSM shall not exceed 0.2 lbs. (0.09 kg) in weight.

The WSSM shall not exceed 3.2 in. x 1.6 in. x 0.8 in. (8.2 cm x 4 cm x 2 cm) in its physical dimensions.

The WSSM shall operate continuously over a temperature range of -67°F to 185°F (-55°C to 85°C).

The body and bracket of the WSSM shall be constructed of aluminum. The pin material shall be gold-plated brass.

The maximum panel thickness of the bulkhead connector of the WSSM shall be 0.3 in. (0.7 cm).

4.0 Mounting. The WSSM shall mount through the traffic cabinet wall.

The WSSM shall feature a rubber O-ring for tight sealing.

5.0 Electrical. The WSSM shall be capable of passing DC power along the cable between the wireless module and the external antenna.

The WSSM shall have a frequency range of 0–3 GHz.

The WSSM protector shall comply with IEC/IEEE standard.

The WSSM shall have an impedance of 50 ohm.

The WSSM shall have a maximum discharge current of 5 kA.

6.0 Connections. The WSSM shall feature N-female to N-female bulkhead–type connectors.

The connector body material of the WSSM shall be nickel-plated brass.

The WSSM connectors shall comply with MIL-C-71A, 39012 standard.

7.0 Testing and standards. The WSSM shall comply with the following environmental specifications:

- Dust and waterproof rating: IEC 529 / IP65
- Moisture resistance: MIL-STD-202 Method 106D
- Salt fog: MIL-STD-202 101D/B
- Vibration: MIL-STD-202 Method 204D/B
- Shock: MIL-STD-202 Method 213B/A
- RoHS compliant

8.0 Testing. Before shipping, each WSSM shall have passed a manufacturer’s test.

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

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