

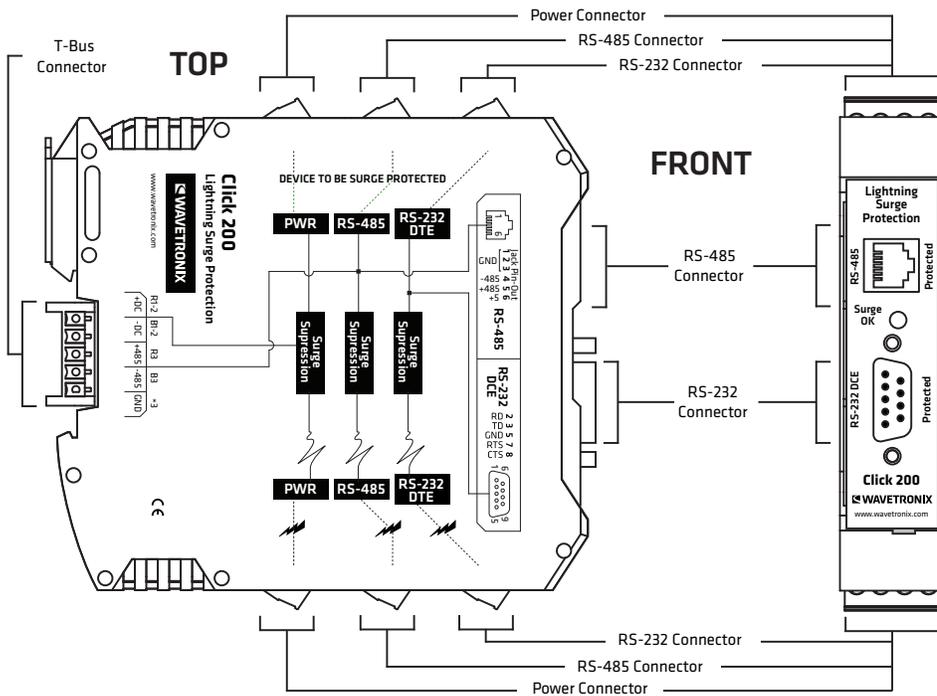
The Click 200 module is designed to protect SmartSensors from surges on all power and communication connections, suppressing power surges for DC power, half-duplex RS-485 communication, and full-duplex RS-232 communication with CTS and RTS.

The Click 200 can also be used to protect any device from surges from the SmartSensor or any other device with 9–28 VDC power or RS-485 or RS-232 communication.



Physical Features

The physical features of the Click 200 include communication and power connections.



Communication Ports

There are six screw terminal blocks on the Click 200, each containing four screw terminals. The three blocks on the top of the module are protected (check for the PROTECTED label to be sure you have the correct side) and the three on the bottom of the module are unprotected. These screw terminal blocks are for wiring power, ground, and communication (RS-232 and RS-485) between the Click 200 and the sensor (or the sensor block, which is in turn connected to the sensor). They will be discussed in greater detail in the Installation section of this document.

There are also two other ways to wire RS-485. The back of the Click 200 features a 5-position connector that plugs into a T-bus connector and provides power and RS-485 communication to the device. It also passes that RS-485 communication to all other devices on the T-bus. In addition, the faceplate of the Click 200 features an RJ-11 jack for RS-485 communication. This jack can be used to connect a jumper cable from the Click 200 to contact closure cards or to another device that uses RS-485 communication.

The front of the device also features a DB-9 connector for RS-232 communication.

Note. *The Click 200 does not convert RS-232 to RS-485 or vice versa. Connecting to the DB-9 connector will allow you to communicate with the sensor using RS-232 protocol, but not using RS-485 protocol. You will also not be able to use the DB-9 connector to communicate with other devices over the T-bus. If you need to convert RS-232 to RS-485, use another Click module such as the Click 304.*

A pinout diagram is provided on each individual unit as a reference in the field.

Note. *Certain newer Click 200 devices also have an LED on the faceplate. This LED, if present, lights up to indicate power is present and surge protection is okay. If the light is off, either there is no power to the device or surge protection is currently not ready.*

Power Connections

The Click 200 receives power from the T-bus via the T-bus connection on the back of the module. Additionally, if the power supply is not wired directly into the T-bus, power can be connected to the +DC and -DC screw terminals on the UNPROTECTED side of the module. In this case, the Click 200 will then pass power through the T-bus to all other devices connected to it.

Installation

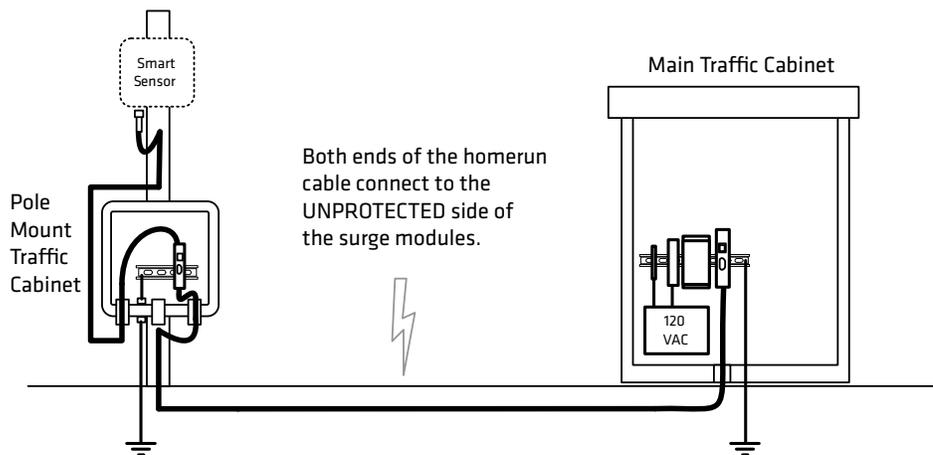
To install the Click 200 in a pole-mount cabinet, simply mount it on the DIN rail and wire the service end of the sensor cable into the PROTECTED side (see the section on wiring for how to do this).

In many installations, the pole-mount cabinet is also connected to a main traffic cabinet via an underground homerun cable. To protect the traffic cabinet, a second surge device is required.

Note. *If any part of the cable goes underground, it's necessary to have a Click 200 on each end of the cable to protect the traffic cabinet and pole-mount box from electrical surges.*

Follow the steps below to include surge protection using Click 200 devices (see the figure below):

1. Install a Click 200 device in a pole-mount box on the same pole as the sensor being protected.
2. Install another Click 200 in the main traffic cabinet.
3. Connect the cable from the sensor to the PROTECTED side of the Click 200 in the pole-mount cabinet. The SmartSensor cable should be kept as short as possible.
4. Connect a cable from the UNPROTECTED side of the Click 200 on the pole to the UNPROTECTED side of the Click 200 in the main traffic cabinet (see the section on wiring for how to do this).

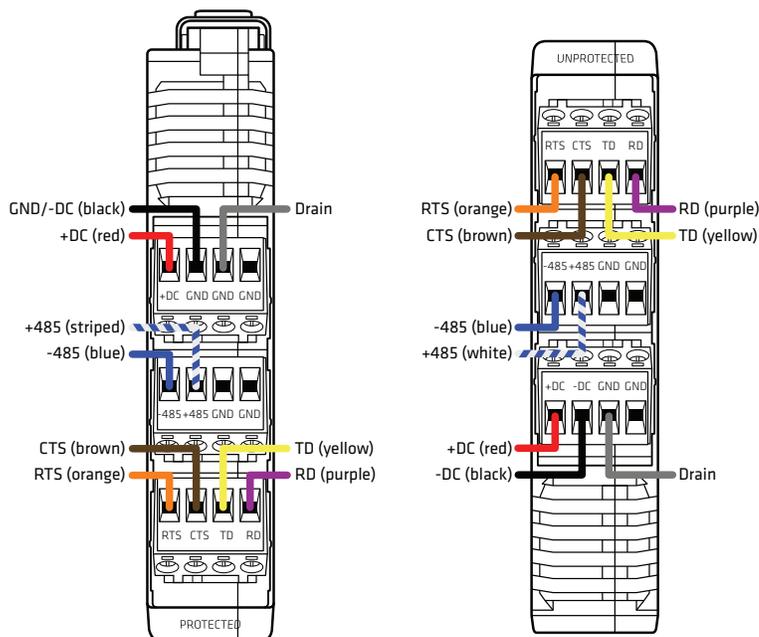


Wiring the Cable

The figure below shows how to wire the two sides of the Click 200. The UNPROTECTED side of the Click 200 is not surge protected and is designed to be connected to the source(s) from which power surges may come.

Note. It is important to note that there are two different cables that could be used with the Click 200. All SmartSensor HD and V sensors are sold with the 8-conductor cable. Older installations, however, may still have the 9-conductor cable, often just called the SmartSensor cable. Differences in the wiring of the 9-conductor cable are noted below.

Note. If you have a 9-conductor cable, there is a ground (gray) wire and a total of three drains; these can all be wired into any of the GND terminals. Also, the +485 wire will not have a blue stripe.



Wiring to Earth Ground

All Click 200 devices should be mounted on a DIN rail that is connected to earth ground, either through an earth-grounded chassis or a 16 AWG or larger grounding wire attached to a 7-foot grounding rod. Follow the steps below to correctly wire to earth ground:

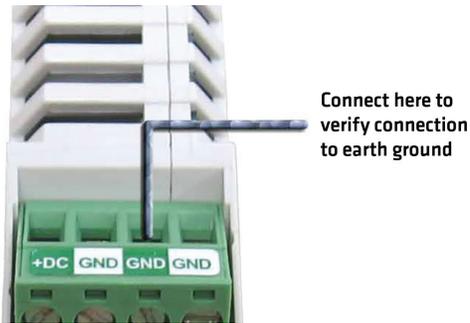
1. Connect the grounding wire from either the DIN rail or a GND screw terminal on the UNPROTECTED side of the Click 200 to the lug bolt on the inside of the pole-mount box.

2. Connect another grounding wire from the exterior lug bolt to earth ground.

Verify Connections to Earth Ground

If there is not a good connection to ground, the Click 200 cards will not protect any equipment. After all connections have been wired, verify that a good connection is made between the Click 200 cards and earth ground by following the steps below:

1. Use a multimeter that is able to measure resistance in increments of less than one ohm.
2. Connect one probe to the drain on the unprotected side of the Click 200 (see Figure 11.5); connect the other probe on the multimeter to earth ground.



3. The resistance should measure less than one ohm. If not, the most likely problem is the DIN rail is not making connection to earth ground through the chassis of the cabinet.

The Click 200 cards have a connector on the bottom that snaps on the DIN rail that provides the connection to earth ground. If the DIN rail is not making a good connection to earth ground, connect a 16 AWG (or larger) wire to the DIN rail with a bolt and run that wire directly to an earth ground terminal.

Verify Communication

Follow the steps below to verify the communication connections:

1. Check the RS-232 connection by plugging a straight-through RS-232 cable between a laptop and the DB-9 connector on the Click 200.
2. Launch SmartSensor Manager and connect via a serial connection. If there are problems connecting, verify that the cabling is set up correctly.
3. Check the RS-485 connection to the SmartSensor using a Click 304 RS-232 to RS-485 converter. Attach the Click 304 to the T-bus (see knowledge base article *0513 T-bus Basics* for more on T-buses) and then plug a straight-through RS-232 cable between a laptop and the DB-9 connector on the faceplate of the Click 304.
4. Launch SmartSensor Manager and connect via a serial connection. If there are problems connecting, verify that the cabling is set up correctly.

Once communication and ground connections have been verified, the installation of the Click 200 is complete.