# Fireye Local/Remote Firing Rate Adapter for the NXF4000 and PPC4000

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For applications where switching between a remote analog firing rate and internal PID control is desired, using the Mirius™ from Industrial Control Communications, Inc. (ICC) makes this possible. See the following link for more detail about the Mirius™: http://www.iccdesigns.com/protocol-gateways/66-mirius.html.

The Mirius™ is a programmable device from a third-party – this is not sold by Fireye. Fireye can provide a device update file for loading into the Mirius™ using the Network Parameter Utility software, also available from ICC. All the programming required for this application to work properly is contained in the device update file.

## METHOD OF CONTROL

The Mirius™ connects to the sequencing bus on the NXF4000 or PPC4000 via the RS485 connection. The Mirius™ has an analog input for the remote firing rate, and two dry-contact digital inputs: remote mode and remote disable. If the Mirius™ is disconnected for any reason, the NXF4000 or PPC4000 will revert to local operation following a communication timeout.

If the NXF4000 or PPC4000 is used with a steam boiler, hot standby can be enabled if a water temperature sensor is installed in the boiler shell. This will keep the water temperature to a minimum setpoint anytime the remote disable is active.

The analog input on the Mirius™ can be configured for 0-20mA, 0-10V or 0-5V. The input is scaled so that the first 20% of the signal is ignored, effectively making the input 4-20mA, 2-10V or 1-5V. Note that this application shows jumpers for 0-20mA – see *Mirius User's Manual* (available from ICC) for 0-10V or 0-5V jumper settings.

## MIRIUS SETUP

The Mirius™ is a DIN-rail mounted device. It is compact, only requiring 30mm (1.18in) of space on the DIN-rail. The Mirius™ can accept input voltage from 9-24VAC/DC and only requires 1.8W of power. The NXF4000 or PPC4000 can provide the necessary power for the Mirius™.

There are 10 jumpers on the Mirius™ that must be configured for this application. To access the jumpers, the plastic cover must be removed from the Mirius™. Gently pry the white cover from the tabs on the black base to lift off. Once the cover is removed, set the jumpers as shown in the figure below. Note that two of the jumpers are only set on one pin – this indicates that these jumpers are not set to either position.
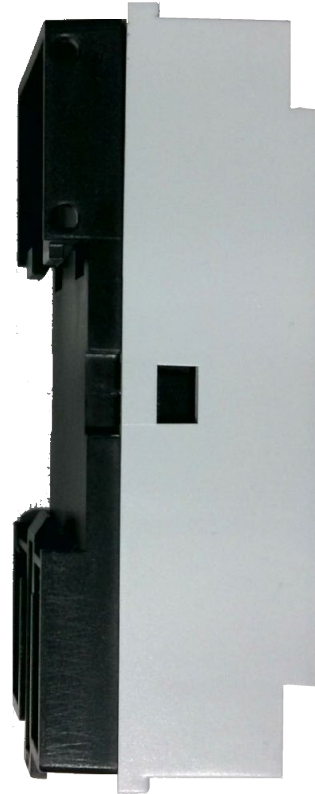
*Mirius™*



*Cover clips*
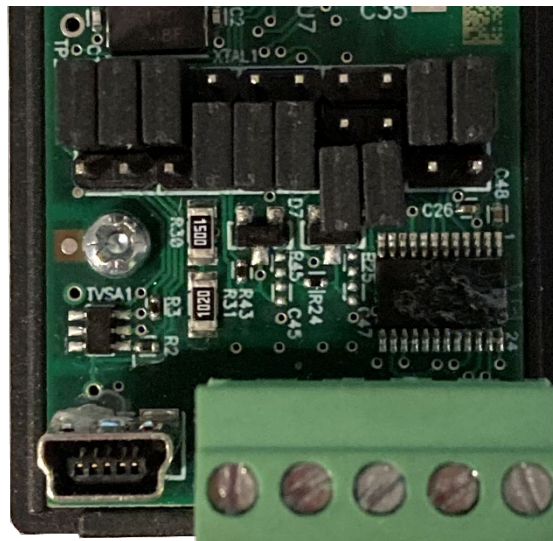


*Jumpers, left to right (USB port on bottom)*

To program the Mirius™ a "Mini USB" cable is required. The USB connection provides the power required for programming. Download and install the *Network Parameter Utility* (NPU) from ICC (http://www.iccdesigns.com/software/65-network-parameter-utility.html). Also make sure to obtain the file *Fireye Local Remote Adapter.duf* from the Fireye website (http://www.fireye.com).

Connect the Mirius™ to the PC using the USB cable. Run the NPU application. If connected properly, the program will indicate that it is connected to a Mirius™.

From the File menu, select "Update Device…". Find and select the file *Fireye Local Remote Adapter.duf*. The file will load into the device. The device may also require a firmware update – this is normal and will happen automatically. Once the device is loaded, it will be ready to install and wire.

**NXF4000 or PPC4000 CONFIGURATION**

Sequencing must be enabled for this application to work. Peer-to-peer lead/lag sequencing cannot be used simultaneously. If Modbus is used for BMS, set the desired address prior to enabling sequencing as sequencing must be disabled to allow access to changing the node address.

Although sequencing is enabled, the NXF4000 and/or PPC4000 units will not be connected to each other so there will never be a master selected.

*SEQUENCING SETUP → MASTER SLCT → KEYPAD*
*SEQUENCING SETUP → SLAVES AVAILABLE → 0*
*KEYPAD SETUP → LEAD LAG KEY → UNUSED*

Additionally, standby can be set up using sensor 2 and setpoint 2 if desired. If standby is configured, whenever the input for remote mode is active and remote disable is active, standby will be enabled to maintain the standby setpoint.
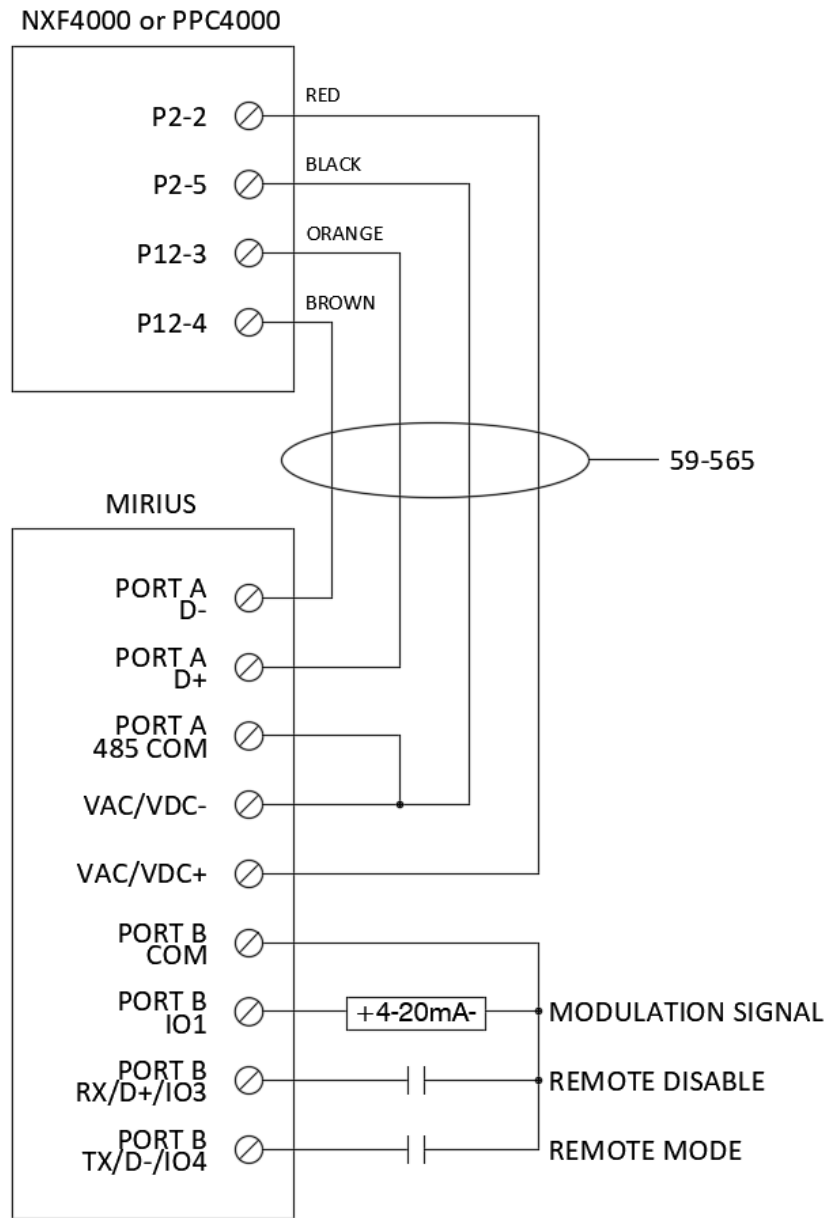
**WIRING**

Fireye part number 59-565 cable (available by the foot) can be used to wire the Mirius™ to the NXF4000 or PPC4000. The Mirius™ should be located within 50 feet of the control to avoid voltage drop on the 24VDC supply.

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**OPERATION**

The analog input requires that the signal and the reference voltage are both connected. The digital inputs are dry contacts, connecting the common voltage reference to the inputs via switches or relay contacts.

**Remote mode input open:** Control will run using the internal sensor and PID output. The remote disable input is ignored.

**Remote mode input closed:** Control will follow remote disable input and remote modulation input.

**Remote disable input open:** Control will enable operation using remote modulation input. Display will read "SEQUENCED SLAVE". If the PCV exceeds the setpoint, the display will read "NO CALL FOR HEAT".

**Remote disable input closed:** Control will disable operation. Display will read "SEQUENCED OFF". If hot standby function is enabled, the internal PID control will enable using the water temperature sensor and setpoint 2.

**Modulation analog input:** Modulation rate will scale from 0% (4mA) to 100% (20mA).

If the Mirius™ loses communication with the NXF4000 or PPC4000, any remote settings will be ignored, and the control will revert to local operation following a 15 second timeout.

Manual modulation and low fire hold both have priority over the remote modulation signal.

## STATUS LEDs

There are three status LEDs.



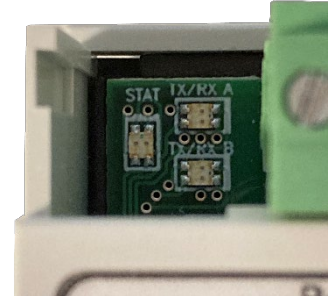*Status LEDs*

**STAT:** This LED will be solid green when the Mirius™ application is running. Note that this LED will flash green if a USB cable is connected.

**TX/RX A:** This LED will flash green when the Mirius™ application is running. This indicates that the communication port is sending data to the NXF4000 or PPC4000. Note that this does not necessarily indicate that the configuration is correct, see *TROUBLESHOOTING* section.

**TX/RX B:** This LED has multiple color states.

- **Off:** Output is local operation
- **Red:** Remote disable is active, but output is local operation
- **Green:** Output is remote operation, using remote modulation (operator interface message is SEQUENCED SLAVE)
- **Orange:** Output is remote operation and remote disable is active (operator interface message is SEQUENCED OFF)

## TROUBLESHOOTING

It is recommended that every remote command is tested to work correctly to ensure that the wiring and configuration are correct. Check that the required messages (SEQUENCED OFF, SEQUENCED SLAVE) appear when remote enable or disable are applied. Also check that the remote modulation signal is being applied correctly.

If operation is not as intended, check the following:

- The Mirius™ has been loaded with the *Fireye Local Remote Adapter.duf* application.
- The wiring between the Mirius™ and NXF4000 or PPC4000 is correct (matches wiring diagram).
- The wiring from the switches or relays to the digital inputs are correct. Note that a dry contact is required (no voltage present).
- The analog 4-20mA input is active and requires that the signal and a reference are provided. There is no voltage provided for the current input.

- Check that all NXF4000 or PPC4000 settings are entered, particularly that sequencing is enabled and that the control is not trying to be a master.

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