

1-LINK GIGABIT ETHERNET COPPER TAPS

C1R-1G C1P-1G C1D-1G C1R-1G-48V C1R-1G-BAT

PRODUCT MANUAL

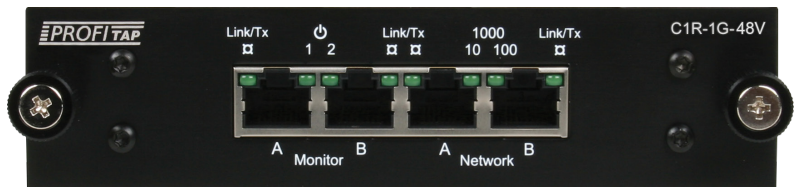
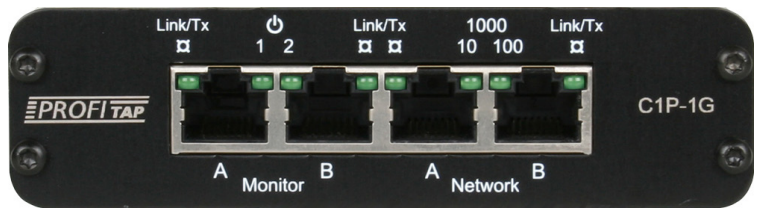
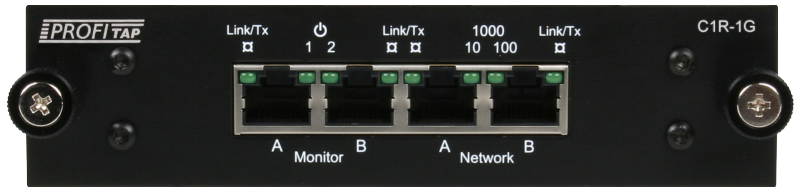


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This package includes:

- 1 x Main TAP Unit (C1R-1G/C1P-1G/C1D-1G/C1R-1G-48V/C1R-1G-BAT)
 - 1 x 90-240 VAC to 12 VDC/0.5 A PSU (C1R-1G/C1P-1G/C1R-1G-BAT only)
 - 2 x -48 VDC Terminal block connectors (C1R-1G-48V only)
 - 2 x 20-30 VDC Terminal block connectors (C1D-1G only)
 - 1 x Carrying pouch (C1P-1G only)
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or by email:

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For the latest documentation and software, visit our Resource Center:

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1. FUNCTIONAL DESCRIPTION

1.1 Interface Connectors

C1-1G TAPs feature 4 RJ45 ports. Network ports A and B are connected to the network, monitor ports A and B are connected to the analyzer.

1.2 Link / Activity

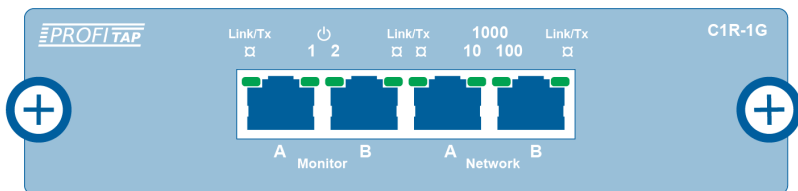
Four LEDs (Link/Tx) indicate Activity and Link for each of the four ports. The LEDs light up when a link is detected on the port. The LEDs blink when traffic activity is detected on the port.

1.3 Speed LEDs

Two LEDs indicate the speed at which the network link is currently operating at. If only the left LED is on, the link is operating at 10 Mbps. If only the right LED is on, the link is operating at 100 Mbps. If both LEDs are on, the link is operating at 1 Gbps.

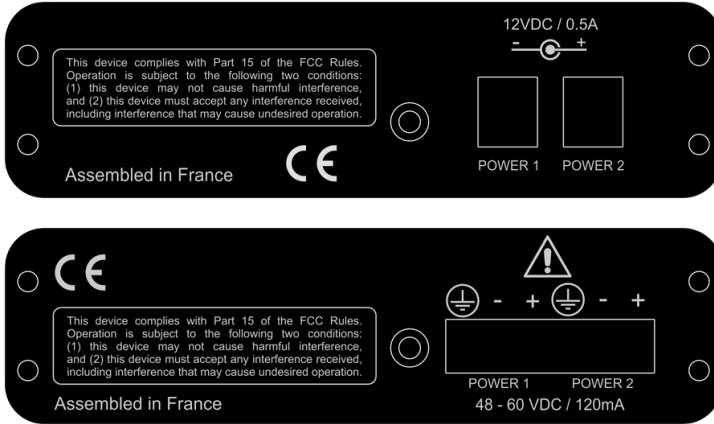
1.4 Link Failure Propagation

Profitap Gigabit Copper TAPs transmit link failure errors between ports, allowing the network to activate a redundant path, while the TAP stays available for autonegotiation. LFP ensures less downtime, and is essential for high availability networks.



1.5 Power

C1-IG TAPs can use redundant powering, guaranteeing continued operation in case power from one of the power inputs were to become unavailable. Two LEDs show the presence of power.



To connect the -48 VDC power to the TAP, do the following:

1. Ensure the DC terminal block connectors are plugged into the TAP.
2. Connect the wires to the power supply in this order:
 - A. Connect the ground wire to the ground connection on the TAP. The connection is located on the bottom of the connector. Tighten the screw located on the front of the connector to attach the cable.
 - B. Connect the 0V wire to the V+ terminal on the terminal block. The connection is located on the bottom of the connector. Tighten the screw located on the front of the connector to attach the cable.
 - C. Connect the -48V wire to the V- terminal on the terminal block. The connection is located on the bottom of the connector. Tighten the screw located on the front of the connector to attach the cable.
3. For redundant power, repeat steps 1 and 2 using the second power supply and cables.

1.6 Power Failure

When the TAP becomes unpowered, it activates its bypass circuits, connecting network ports A and B together. Monitor ports are disabled when the TAP is unpowered.

1.6.1 Fast Failover (C1P-1G, C1R-1G, C1D-1G, C1R-1G-48V)

When a power transition event occurs, the network devices renegotiate the link. This operation can take up to 5 seconds depending on network configuration and can cause a network topology reconfiguration. The Fast Failover feature helps to reduce this time by trying to keep the link up without renegotiation during the power change event.

With Fast Failover, the network path unavailability lasts between 30 and 300 ms.

1.6.2 Battery Failover (C1R-1G-BAT)

When a power transition event occurs, the battery enables the network link to stay up without interruption, preventing any risk of topology reconfiguration, and avoiding any loss of packets.

1.7 Battery (C1R-1G-BAT)

BATT LED states:

Steady Green: Battery Charging (1.7.1)

Steady Orange: Battery Checking / Charging (1.7.1)

Blink Green: Battery Discharging (1.7.2)

Blink Orange: Battery Discharging (1.7.2)
or Maintenance (1.7.3)

Steady Red: Battery life suboptimal. Replace the battery for optimal performance. (1.7.4.2)

Off: No Battery (1.7.4.1)

1.7.1 Charging

Battery charging is indicated by a steady orange state on the BATT LED. This LED state also indicates a maintenance operation (1.7.3). The BATT LED is steady green when the battery is fully charged. The battery takes about 2 hours to charge.

Overcharging protections:

- Temperature Limit: Battery temperature over 55°C
- Voltage Limit: Battery voltage over 9V
- ΔT : Battery temperature increasing too quickly
- $-\Delta V$: Battery voltage decreasing too quickly

If any of these conditions occurs, the charge is interrupted.

1.7.2 Discharging

During battery discharge, the BATT LED blinks:

- Green: when the remaining capacity is over 50%
- Orange: when the remaining capacity is under 50%

Overdischarging protection:

The battery controller shuts down the TAP if the battery voltage goes below 6.5V.

1.7.3 Maintenance

Cold battery

If the battery's temperature is below 10°C, the TAP slowly heats up the battery (with medium rate charging) to prevent potential thermal shock damage.

Deep discharge recovery

If the battery's voltage is too low, the TAP charges the battery at medium rate, until the voltage reaches an appropriate level.

1.7.4 Battery Error

No battery

The BATT LED is off if the battery is invalid or not present.

Battery life suboptimal

If the battery takes less than 1 hour to discharge (measured at a full discharge cycle), the BATT LED turns red after the reboot. The TAP keeps that state until the battery is replaced. In this error state, the TAP and battery still operate normally.

Replace the battery to ensure optimal performance.

Refer to the *Battery replacement* chapter (1.7.6).

1.7.5 TAP

The Battery TAP is similar to other C1-1G TAPs. It provides the same features and is based on the same hardware and software.

1.7.6 Battery Replacement

THE TAP MUST BE POWERED ON DURING THIS OPERATION.

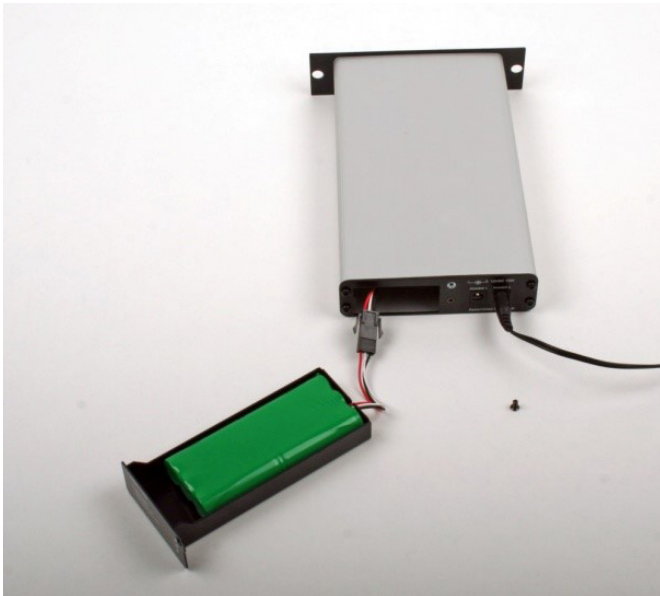
1. Remove the battery drawer screw at the back of the TAP



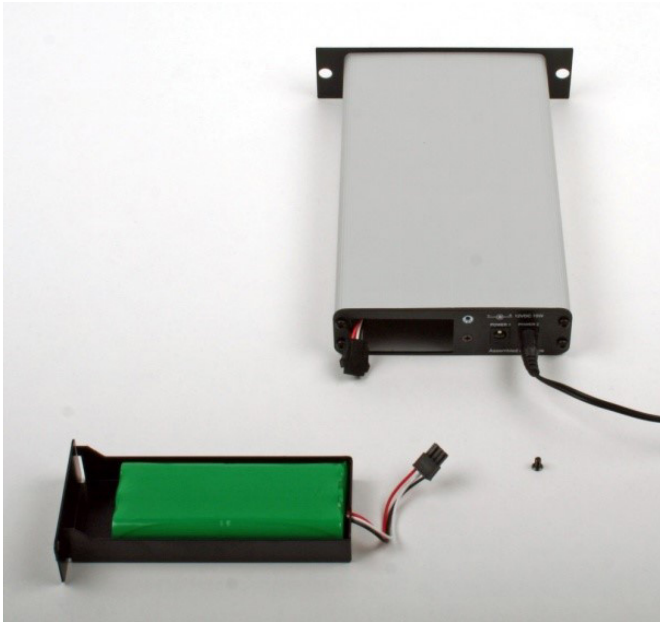
2. Move drawer to the right
3. Pull drawer out of the TAP



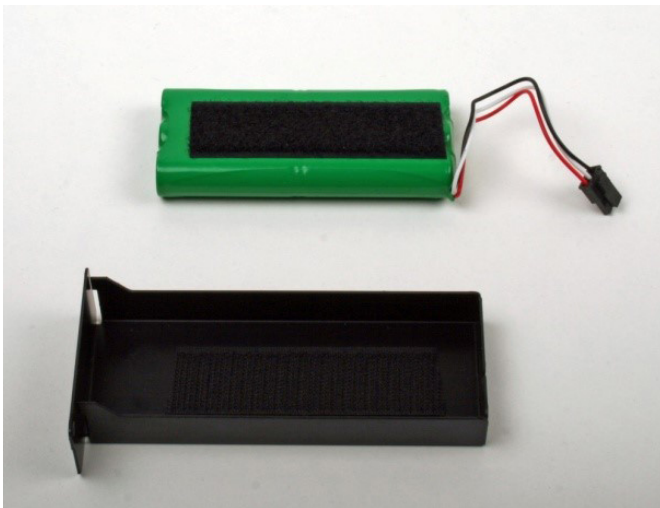
4. Pull connector out of the TAP



5. Disconnect the battery



6. Install the new battery by following these steps in the reverse order



1.7.7 Switch the TAP off

In cases in which the TAP needs to be powered off completely (e.g. for transportation), the procedure is as follows:

- 1.** Power the TAP on
- 2.** Take the battery out and disconnect it (see chapter *1.7.6 Battery replacement*)
- 3.** Disconnect the power supply
- 4.** Connect the battery
- 5.** Put the battery back in the TAP

2. INSTALLATION

1. Power both network devices. Do NOT power the TAP. Connect the network devices to the TAP using category 5e UTP cables.
 - If one of the network devices is of DTE type, and the other one of DCE type, use straight cables.
 - If both network devices are of the same type (both DTE or both DCE) use one straight cable and one cross-over cable.

The connected network devices should show a link, or traffic activity. If there is no link, change one of the cables by a cable of opposite type.

2. Power the TAP. If two network devices are connected on the network ports, the Speed LEDs blink to indicate the negotiation of the highest mutual speed. When the connection is established, the Speed LEDs indicate the network speed:
 - Left LED only for 10 Mbps
 - Right LED only for 100 Mbps
 - Both LEDs for 1 Gbps

If no mutual speed is detected, the two Speed LEDs blink alternatively.

Network activity is shown by the Link/Tx LEDs of Network A and Network B.

3. Connect the Monitor ports to the analyzer using straight or cross-over CAT5e cables. The Monitor ports operate at the same speed as the Network ports. The Monitor ports' Link/Tx LEDs are on when a link is found. Traffic received by Network A and Network B will be mirrored to Monitor A and Monitor B respectively, and the Link/Tx LEDs will blink as traffic passes through. The maximum distance between any of the connected devices is 100 meters.

3. TECHNICAL SPECIFICATIONS

| <i>C1R-1G</i> | |
|-------------------------------------|--|
| <i>Connectors</i> | <i>4 x RJ45 8-pin gold plated</i> |
| <i>LEDs</i> | <i>4 x Link/Activity, 2 x Network speed, 2 x Power</i> |
| <i>Power Input</i> | <i>2 x 12 VDC (1 required for operation, 2 for redundancy)</i> |
| <i>Power Consumption</i> | <i>4 W</i> |
| <i>Dimensions (WxDxH)</i> | <i>113 x 128 x 30 mm — 4.4 x 5 x 1.2 in</i> |
| <i>Front Panel Dimensions (WxH)</i> | <i>143 x 35 mm — 5.6 x 1.4 in</i> |
| <i>Accessories</i> | <i>1 x 90-240 VAC PSU</i> |
| <i>MTBF</i> | <i>250,000 hours</i> |
| <i>Operating Temperature</i> | <i>0°C to 50°C</i> |
| <i>Storage Temperature</i> | <i>-22°C to 70°C</i> |
| <i>Humidity</i> | <i>10 to 90%, non-condensing</i> |
| <i>Certifications</i> | <i>RoHS, CE, FCC class A, IEEE 802.3</i> |

| <i>C1P-1G</i> | |
|-------------------------------------|--|
| <i>Connectors</i> | <i>4 x RJ45 8-pin gold plated</i> |
| <i>LEDs</i> | <i>4 x Link/Activity, 2 x Network speed, 2 x Power</i> |
| <i>Power Input</i> | <i>2 x 12 VDC (1 required for operation, 2 for redundancy)</i> |
| <i>Power Consumption</i> | <i>4 W</i> |
| <i>Dimensions (WxDxH)</i> | <i>113 x 128 x 30 mm — 4.4 x 5 x 1.2 in</i> |
| <i>Front Panel Dimensions (WxH)</i> | <i>—</i> |
| <i>Accessories</i> | <i>Zipper Pouch — 2 x RJ45 Cables — 1 x 90-240 VAC PSU</i> |
| <i>MTBF</i> | <i>250,000 hours</i> |
| <i>Operating Temperature</i> | <i>0°C to 50°C</i> |
| <i>Storage Temperature</i> | <i>-22°C to 70°C</i> |
| <i>Humidity</i> | <i>10 to 90%, non-condensing</i> |
| <i>Certifications</i> | <i>RoHS, CE, FCC class A, IEEE 802.3</i> |

| C1D-1G | |
|-------------------------------------|---|
| <i>Connectors</i> | <i>4 x RJ45 8-pin gold plated</i> |
| <i>LEDs</i> | <i>4 x Link/Activity, 2 x Network speed, 2 x Power</i> |
| <i>Power Input</i> | <i>2 x 20–30 VDC (1 required for operation, 2 for redundancy)</i> |
| <i>Dimensions (WxDxH)</i> | <i>113 x 128 x 30 mm — 4.4 x 5 x 1.2 in</i> |
| <i>Front Panel Dimensions (WxH)</i> | <i>—</i> |
| <i>Accessories</i> | <i>2 x 20–30 VDC Terminal Block Connectors</i> |
| <i>Operating Temperature</i> | <i>0°C to 70°C</i> |
| <i>Storage Temperature</i> | <i>-40°C to 120°C</i> |
| <i>Humidity</i> | <i>10 to 90%, non-condensing</i> |

| C1R-1G-48V | |
|-------------------------------------|---|
| <i>Connectors</i> | <i>4 x RJ45 8-pin gold plated</i> |
| <i>LEDs</i> | <i>4 x Link/Activity, 2 x Network speed, 2 x Power</i> |
| <i>Power Input</i> | <i>2 x -48 VDC (1 required for operation, 2 for redundancy)</i> |
| <i>Dimensions (WxDxH)</i> | <i>113 x 128 x 30 mm — 4.4 x 5 x 1.2 in</i> |
| <i>Front Panel Dimensions (WxH)</i> | <i>143 x 35 mm — 5.6 x 1.4 in</i> |
| <i>Accessories</i> | <i>2 x -48 VDC Terminal Block Connectors</i> |
| <i>MTBF</i> | <i>250,000 hours</i> |
| <i>Operating Temperature</i> | <i>0°C to 50°C</i> |
| <i>Storage Temperature</i> | <i>-22°C to 70°C</i> |
| <i>Humidity</i> | <i>10 to 90%, non-condensing</i> |

C1R-1G-BAT

| | |
|-------------------------------------|--|
| <i>Connectors</i> | <i>4 x RJ45 8-pin gold plated</i> |
| <i>LEDs</i> | <i>6 x Link/Activity, 2 x Network speed, 2 x Power, 1 x BATT</i> |
| <i>Power Input</i> | <i>2 x 12 VDC (1 required for operation, 2 for redundancy)</i> |
| <i>Dimensions (WxDxH)</i> | <i>113 x 210 x 30 mm — 4.4 x 8.3 x 1.2 in</i> |
| <i>Front Panel Dimensions (WxH)</i> | <i>143 x 35 mm — 5.6 x 1.4 in</i> |
| <i>Accessories</i> | <i>1 x 90-240 VAC PSU</i> |
| <i>Operating Temperature</i> | <i>0°C to 50°C</i> |
| <i>Storage Temperature</i> | <i>-22°C to 70°C</i> |
| <i>Humidity</i> | <i>10 to 90%, non-condensing</i> |

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PROFITAP HQ B.V. – High Tech Campus 84
5656AG Eindhoven – The Netherlands

sales@profitap.com
www.profitap.com

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