Power over Ethernet and network range extender

Power over Ethernet (POE) greatly simplifies the deployment of IP cameras, wireless access points & equipment more than 100m from network points

- Instantly doubles cable range to 200 metres
- Extends up to 800 metres with multiple units
- No local power required
- Full unrestricted network bandwidth
- Universal 10/100 compatibility
- Extends POE and POE Plus up to 60 watts
Cable lengths in Ethernet networks are limited to 100 metres (328 ft), which is a serious restriction for many security installations.

OUTREACH Max enables installers to overcome this network limitation. Simply connecting an OUTREACH Max in line with the network cable instantly doubles the range from 100 to 200 metres (656 ft).

**Simple to install**

Fitting OUTREACH Max is simple because no set-up is required. Its only connections are two RJ45 network ports, both of which immediately self-configure for 10 or 100BASE-T operation. POE power is automatically transferred between connected equipment. No local power supply connection is needed, because OUTREACH Max is powered by POE.

OUTREACH Max can easily be located anywhere along the network cable, as long as no single length of cable is greater than 100 metres. For example, to extend the network connection between a POE switch and an IP camera to 170 metres, an OUTREACH Max could be installed 90 metres from the switch. A further 80 metres of cable would run from the OUTREACH Max to the camera.

**Max POE power**

OUTREACH Max enables network range extension to all POE devices that are compatible with IEEE 802.3af, which is the universal POE standard for low power network devices such as fixed IP cameras.

In addition, OUTREACH Max is also compatible with high-power standards such as POE Plus (IEEE 802.3at), and even “4-pair” POE for devices of 60 watts or more.

Note that OUTREACH Max is designed for connection to POE-compatible equipment only. If POE power is not required, Veracity’s OUTREACH Lite should be specified instead.

**No restrictions**

Because OUTREACH Max simply restores the network connection every 100 metres, the full (200Mbit/s) bandwidth of 100BASE-T Ethernet is maintained across the entire link. This maximises performance and transparency, with no risk of a reduced or unpredictable bandwidth, even at distances of several hundred metres.

Or a 5 watt IP camera may be located up to 800 metres away, using seven OUTREACH Max units and Veracity’s OUTSOURCE POE injector.

The maximum extension distance depends on how much power is required and which POE source is used. See the tables on the next page or read Veracity’s “Long Range Ethernet Extension” white paper on our website.

**Diagram 1. A single OUTREACH Max doubles the cable range to a POE IP Camera. Each cable segment can be up to 100 metres.**
If only Ethernet extension is required, use OUTREACH Lite

OUTREACH Lite extends Ethernet only and does not forward POE.

If POE forwarding is also required, use OUTREACH Max

OUTREACH Max supports all standards of POE forwarding, but does not support data-only extension.

Maximum Extension Distance

By installing an OUTREACH Max for every extra 100 metres of cable, POE and Ethernet can be extended for considerable distances with no loss of network bandwidth. The limit depends on which POE Source is used and on how much power the IP camera or other device requires:

<table>
<thead>
<tr>
<th>POE Source</th>
<th>POWER REQUIRED BY CAMERA</th>
</tr>
</thead>
<tbody>
<tr>
<td>No POE</td>
<td>6W</td>
</tr>
<tr>
<td>POE Switch</td>
<td>800m</td>
</tr>
<tr>
<td>OUTSOURCE</td>
<td>1150m</td>
</tr>
<tr>
<td>OUTSOURCE Plus</td>
<td>1150m</td>
</tr>
</tbody>
</table>

These are strict limits for installations using regular 24AWG Cat 5e cable. Distance is limited by the peak power required by the device; its POE “power class” is not used. Use of OUTSOURCE or OUTSOURCE Plus injectors is recommended for extension beyond 300 metres.

For example, installing a 5 watt IP camera 500 metres (1640 ft) from its power source would require four OUTREACH Max units and an OUTSOURCE injector. The table shows that OUTSOURCE can deliver 6 watts at 700 metres, so this is safely within the maximum range that is permitted.

*No POE* distances are for Ethernet extension only, and the last device in the chain must be an OUTREACH Lite. See the OUTREACH Lite datasheet for details, or consult Veracity’s application notes for more in-depth information on long-range Ethernet extension.
### POWER

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>1.3 watts via POE</td>
</tr>
</tbody>
</table>

### FORWARDED POE POWER

- Up to 70 watts depending on standard
- Maximum current 0.7 amps on data pairs
- Maximum current 1.5 amps on spare pairs

### POE STANDARDS

- IEEE 802.3af POE
- IEEE 802.3at POE Plus (2-event signature)
- Custom POE (incl. "always-on 48V" and "4-pair")

### ETHERNET INTERFACE

- Two independently auto-configuring 10/100 ports
- (10BASE-T/100BASE-TX, half/full duplex)
- Patch or crossover cables supported

### LEDs

- Status Indicators
  - Power good, network link/activity (both ports)

### PHYSICAL/ENVIRONMENTAL

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>L105mm W 40mm H 22mm</td>
</tr>
<tr>
<td>Weight</td>
<td>45g (1.6 oz)</td>
</tr>
<tr>
<td>Mounting</td>
<td>Two 7mm diameter mounting holes, centres 89mm apart</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10°C to 50°C [-14°F to 122°F]</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>Up to 85%, non-condensing</td>
</tr>
<tr>
<td>Compliance</td>
<td>CE, FCC, RoHS</td>
</tr>
</tbody>
</table>

### PRODUCT CODES

- **VOR-ORM** OUTREACH Max Ethernet and POE extender
- **VOR-ORL** OUTREACH Lite Ethernet extender
- **VOR-ORM-XT** OUTREACH Max XT Outdoor Ethernet & POE extender
- **VOR-ORL-XT** OUTREACH Lite XT Outdoor Ethernet extender
- **VOR-OS** OUTSOURCE POE injector
- **VOR-OSP** OUTSOURCE Plus POE Plus injector