Extended reach installation guidelines

Evolving mobility and connectivity needs are often restricted by traditional cabling coverage boundaries. Network complexity and power requirements can also impose restrictions. To enable extended coverage and enhanced flexible network design, CommScope has carried out extensive testing to ensure reliable coverage beyond traditional 100 meter requirements. Combining carefully selected products from our leading SYSTIMAX® and RUCKUS® brands, CommScope is able to demonstrate flawless network functionality, offering customers the ability to leverage a closed PoE-based ecosystem that extends the length over which traditional switch/AP combinations will support Wi-Fi networks up to 180 meters or 600 feet (in real-life conditions).

Equipment covered

Multi-gigabit PoE switch—Ports 25 through 48 of the RUCKUS ICX7650-48ZP multi-gigabit PoE switch are 100 MbE/1 GbE/2.5 GbE/5 GbE/10 GbE POH capable and are authorized for use over the extended distances covered in this guideline.

Cabling—Category 6A channel configurations containing up to four connections that are constructed using GigaSPEED® X10D 2091B cable and 360GS10E cords are authorized to support extended lengths between the RUCKUS ICX7650-48ZP and either the RUCKUS R750 or R850 Wi-Fi 6 access points. Connections in the channel can be made using MGS600 information outlets or 1100GS6 patch panels. For ease of installation a CommScope Category 6A ceiling connector assembly can be used as one of the connections.

Access point—The RUCKUS R850 is a Wi-Fi 6 PoE enabled access point that supports 5GBASE-T and 2.5GBASE-T applications. The RUCKUS R750 is a 2.5GBASE-T capable Wi-Fi 6 PoE enabled access point. Both are authorized for use over the extended lengths described in this guideline.

Supported length between active devices

2.5GBASE-T applications are supported when the R750 access point is connected to ports 25 to 48 of the ICX7650-48ZP using up to 180 m of GigaSPEED X10D cabling.

2.5GBASE-T applications are supported when the R850 access point is connected to ports 25 to 48 of the ICX7650-48ZP using up to 180 m of GigaSPEED X10D cabling.
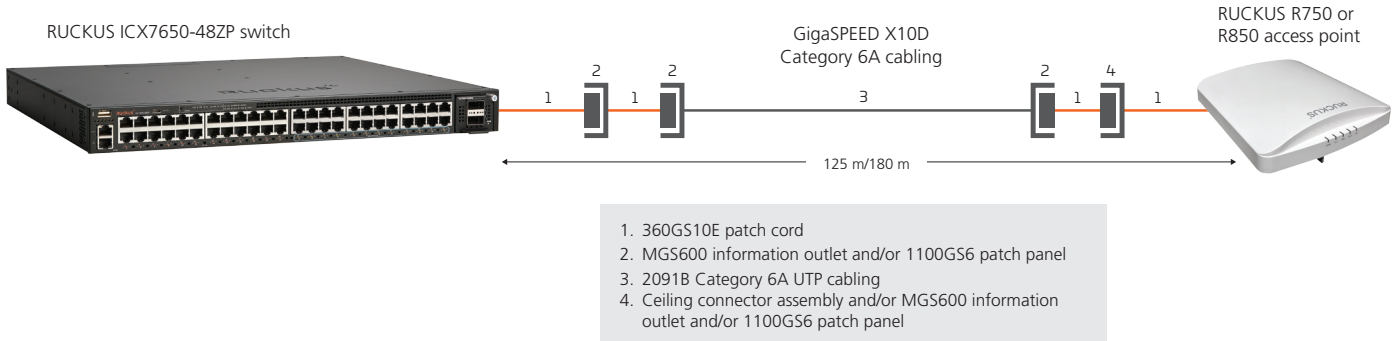
5GBASE-T applications are supported when the R850 access point is connected to ports 25 to 48 of the ICX7650-48ZP using up to 125 m of GigaSPEED X10D cabling.

Channel considerations

Number of connectors—GigaSPEED X10D cabling containing up to four connections (four-connector channel) is authorized for use in channels used to join the ICX7650-48ZP switch and R750 or R850 access points.

Length of cordage—Up to 15 meters of 360GS10E solid conductor cordage is authorized for use in channels joining the ICX7650-48ZP switch and R750 or R850 access points.

RUCKUS ICX7650-48ZP switch

GigaSPEED X10D
Category 6A cabling

RUCKUS R750 or
R850 access point

125 m/180 m

1. 360GS10E patch cord
2. MGS600 information outlet and/or 1100GS6 patch panel
3. 2091B Category 6A UTP cabling
4. Ceiling connector assembly and/or MGS600 information outlet and/or 1100GS6 patch panel

Overall length—The lengths identified above are permitted for channels operating in environments whose ambient temperature does not exceed 20°C. When the cabling is employed in environments that exceed 20°C the length of the channel may need to be reduced. This may mean limiting the length of the horizontal cabling supporting 5GBASE-T operation when used to connect to the R850 access point or the length of horizontal cabling supporting 2.5GBASE-T operation when used to connect to either the R850 or R750 access points. Guidance on limiting the length of horizontal components of cabling installed in higher temperature environments can be found in Annex I of TIA 568.2-D. The table below shows the maximum horizontal cable length de-rating at various temperatures when the channel includes 15 meters of patch and equipment cords at 20°C.

PoE bundling—CommScope recommends that customers follow the CommScope PoE installation guidelines when installing their cabling products. These guidelines were developed to ensure that the temperature rise of cable bundles used for PoE applications is limited to 15°C. With respect to this guideline, this is most easily accomplished by limiting the size of cables considered in this guideline to 24. If cables are bundled, the temperature rise introduced by PoE applications represents a rise in ambient temperature and may require that the length of the supported channel be reduced according to the guidance given above for cables operating in elevated temperature environments.

Alien crosstalk and bundling—GigaSPEED X10D cabling fully complies with the alien crosstalk requirements specified in TIA 568.2-D. Extended length cabling should limit the length over which alien crosstalk exposure occurs to 90 meters. As an example, a 125 m channel supporting 5GBASE-T operation when used to connect the ICX7650-48ZP and R850 access point should limit bundling with other channels to 90 meters.

Length derating guidance for elevated environmental temperature

Temperature (Celsius)	Maximum horizontal cable length (m)—125 m extended length support	Length de-rating (m)	Maximum horizontal cable length (m)—180 m extended length support	Length de-rating (m)
20	110	0	165	0
25	108	2	162	3
30	106	4	159	6
35	104	6	156	9
40	102	8	153	12
45	99	11	149	16
50	96	14	144	21
55	94	16	140	25
60	91	19	137	28