



Guidelines for Setting System Data Rate and RF Bandwidth

The SkyWay 7000 system allows a variety of data rate and RF bandwidth settings. There is no single, correct setting as each wireless network has a unique physical layout and unique requirements. In general, there is a tradeoff between distance and throughput. There are two reasons for this: first, with increased distance, a reduction of throughput occurs simply due to the time it takes the RF signal to travel between radios. Second, higher RF data rate settings require more power (actually, SNR) at the receiver. Thus the higher RF data rate, the closer the radios need to be located to each other.

The SkyWay 7000 system provides an option to mitigate the effect of distance on throughput. The amount of radio spectrum or bandwidth can be used to offset the effects described above. A standard OFDM channel is approximately 20 MHz wide. The SkyWay 7000 provides the option to double this bandwidth, to 40 MHz. This yields two benefits – for a given data rate setting, say 36 Mbps, this allows the link to operate almost 40% farther. Or, if a link requires higher throughput, the wider bandwidth allows a higher data rate at the same distance. The tradeoff for using a wide bandwidth setting is that fewer non-overlapping channels are available, making it more difficult to avoid interference sources or co-locating multiple radios on a single tower or rooftop.

The choice of data rate and RF bandwidth settings depends on a variety of factors unique to each installation. However, Solectek recommends that customers begin by using the 36 Mbps/ Normal bandwidth settings. These defaults provide well balanced performance: good throughput at moderate distance. From there, you may want to experiment with other settings to achieve different performance goals. Refer to Figure 1 below for recommended migrations from the default settings and detailed range information. Keep in mind that radios also have a required minimum distance, necessary to prevent overloading of the receiving side.

distances in Miles		Point-to-Point			MultiPoint, Sectoral Base			MultiPoint, Omni Base		
<u>Data Rate</u>	<u>Bandwidth</u>	Model:			Subscriber Model:			Subscriber Model:		
		7101	7301	7501	7100	7300	7500	7100	7300	7500
108 Mbps	40 MHz	1.1	2.7	5	0.4	1.0	1.4	--	0.5	0.8
72 Mbps	40 MHz	3.1	11	22	1.1	3.9	5.5	0.6	2.2	3.1
54 Mbps	20 MHz	1.5	3.9	8	0.5	1.4	1.9	0.3	0.8	1.1
36 Mbps	20 MHz	4.3	15	30+	1.5	5	8	0.9	3.1	4.3
6 Mbps	20 MHz	22	30+	30+	8	27	30+	4.3	15	22
Minimum Distance:		100 ft	0.9	1.7	450 ft	0.3	0.4	250 ft	0.2	0.25

Figure 1: Minimum and Maximum Link Distances for SkyWay 7000 product family. Unless otherwise noted, all distances shown in miles.