

## IMG STAGELINE FLY-16

### Wireless System for Line Level Transmission

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Since December 2018, FLY-16, a system for wireless transmission of line level audio signals, has been part of the IMG STAGELINE product portfolio. We have examined the system.

### Concept and Technology

Transmission with FLY-16 is analog and thus without latency; the transmission range is 823 to 832 MHz (LTE middle gap). In Germany and other countries too, this 9 MHz frequency range does not require any registration and can therefore be used free of charge.

A set, consisting of a transmitter FLY-16T and a receiver FLY-16R, transmits an audio channel. Consequently, two sets are required for the transmission of stereo signals. According to the manufacturer, the transmission range is 30Hz to 17kHz. 16 channels can be selected. The output power is 10mW.



For simultaneous usage of multiple paths, two frequency groups with seven (0, 2, 4, 9, C, E, F) or nine (0, 1, 2, 3, 6, 7, 8, B, C) intermodulation-free channels are recommended. The first instruction manuals specify other frequency groups.

The components are of equal size (width 22mm, height 23mm, length of transmitter 116mm, length of receiver 102mm). The only optical difference is that the transmitter is equipped with an XLR jack and the receiver with an integrated XLR plug. The maximum input level allowed at the transmitter is 0.775V. The inputs and outputs are electronically balanced.

Power is provided by means of a battery (size AAA) or a micro USB port (5V). This offers the advantage that the battery will provide power in case of failure of the USB voltage supply. The maximum power consumption of the components is 350mA

when switched on.

### Handling



The components are operated by means of a pushbutton (SET). The seven-segment LED located at the top shows the channel designation. The LED indicates the status of the component: green = switched on and battery okay; red = the battery must be replaced; LED flashing on the receiver = no transmitter signal detected. The components will be switched on when the pushbutton is pressed for a longer period of time; they will be switched off when the pushbutton is briefly tapped and then kept pressed. The channels are sequentially changed by brief taps on the pushbutton. This is all you need to know about operation.

### Practical Application

At first, we analyzed the transmitter signal by means of a RF spectrum analyzer. The bandwidth is approx. 125kHz. The distance to the selectable channels differs, but is always at least 300kHz. Using a GPS based frequency standard, we also checked the precision of frequency. The carrier frequencies always differed only by a few hundred Hertz from the rated frequency, i.e. were always definitely within the tolerance range. The AF output level at the receiver matches the input level at the transmitter. The difference we measured for the sample system was far below 1 dB. So, all the values we measured were fine.

Now, let's turn to the sound quality. The FLY-16 system is designed for audio transmission in PA applications. Therefore, we first conducted a test, reproducing sound via a speaker with the receiver output of the RF path on one channel and the original signal on the other channel. The sound quality of the FLY-16 system is fine. For exact sound evaluation, we listened to songs of different music styles, using headphones, namely an SPL Phonitor 2 headphone monitoring amplifier where you can switch between two sources. You will of course notice sound differences when using headphones: the low bass frequencies are less distinct and appear to be softer than the original. This is particularly significant for very low bass frequencies, bass drums and low frequency transient sound. Also, the transparency of the higher frequencies is slightly restricted which, however, is to be expected because the transmission range is up to 17 kHz according to the manufacturer specifications. This effect will of course be substantially less significant for sound reproduction via a speaker.

For the reproduction of speech, the FLY-16 system can easily be used without any hesitation. For the reproduction of music, the system meets requirements up to the lower professional level. Demanding users will prefer wire-connected transmission systems anyway. As with any wireless transmission, analog transmission and frequency modulation are bound to change the signal.

However, the quality is more than sufficient for many applications. Especially for small-scale gigs where you do not want to use cables from FOH to the PA monitors or, if applicable, to the stage monitors, the FLY-16 system is a most reasonable solution, offering major practical benefits. Also for other applications where you want or have to do without any cables in the conference or event area, the wireless line level transmission system comes in handy.

Handling is most convenient. Practical tests definitely confirm the range of 90 m as specified by the manufacturer for transmissions where there are no obstacles - or to put it in other words, the range proved to be much longer in our tests. However, as with any wireless transmission, interference must be taken into account which may, for example, be due to LED walls or other objects that produce noise level or to LTE mobile phones that are very close to the receiver. The FLY-16 system uses the LTE middle gap; therefore, it is important to pay attention to mobile phones: Modern mobile phones have a high output power; an LTE mobile phone able to emit signals

at full power may, when in close proximity to the receiver, impair the wireless transmission path in the LTE middle gap. If this issue is taken care of, there will be nothing to worry about.

### **Conclusion**

The set FLY-16SET, consisting of a transmitter FLY-16T and a receiver FLY-16R, costs about 179 € which would be 358 € for a stereo set. The price of an individual transmitter or receiver is about 100 € each. IMG STAGELINE grants a warranty of three years for the products.

For users who only want or have to transmit audio signals by wireless line level transmission, the FLY-16 system is a most reasonable alternative to wire-connected transmission systems. Users whose quality requirements do not preclude the general restrictions of analog wireless transmission, will be happy with the FLY-16 system from IMG STAGELINE. The product is reliable and easy to handle and provides an excellent price-performance ratio.

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