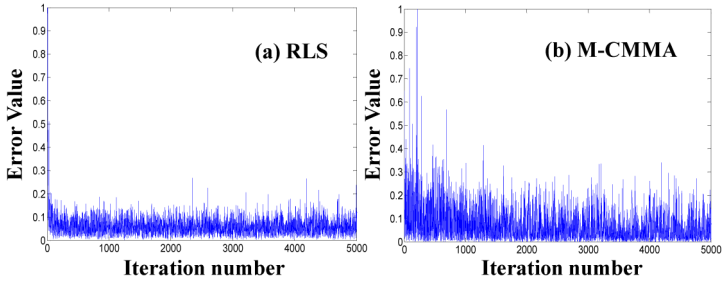

Fig. 2. The error value vs. different iteration number of (a) RLS, (b) M-CMMA

Table 1. The required computation of M-CMMA and RLS in one interation.

Algorithm	M-CMMA	RLS
Multiplier	8N + 16	$4N^2 + 4N + 1$
Adder	8N + 20	$3N^2 + N$
Comparator	28	0
Required interation	All the symbols	About 200

3. Experimental setup

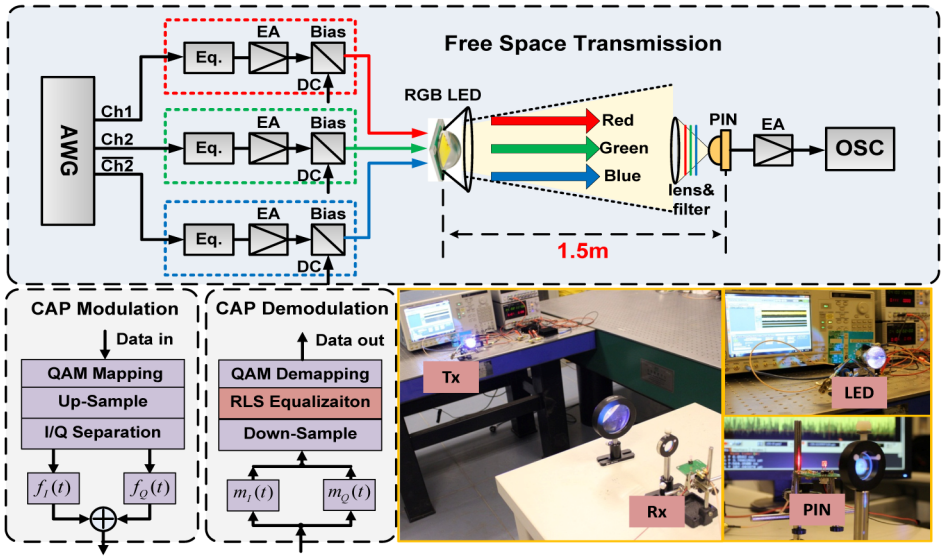

Fig. 3. The experimental setup of the WDM VLC system employing CAP and RLS

Figure 3 shows the experimental setup of the RGB-LED based WDM VLC system employing CAP modulation and RLS adaptive equalization. At the transmitter, the original bit sequence is firstly mapped into complex symbols for 64QAM. Then the QAM signals are sent for CAP modulation. The detail of the CAP modulation and demodulation has been well described in [12]. Here $f_I(t)$ and $f_Q(t)$ are the orthogonal shaping filter pair. The roll-off coefficient of the square-root raised-cosine function for CAP modulation is set to 0.02 for a high spectral efficiency. Although the energy efficiency of CAP modulation is lower than OFDM, the advantage of CAP modulation is that no electrical or optical complex-to-real-value conversion is necessary. Neither does it require the discrete Fourier transform (DFT) that utilized in OFDM signal generation and demodulation. The CAP signal can be generated by employing a digital filter with several taps and detected by a matching digital filter. So it can reduce the complexity of computation and system structure considerably.

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