

Pixel Protocols Cheat Sheet

Note: all ENTTEC Pixel Controllers —[OCTO](#), [DIN PIXIE](#), [PIXELATOR MINI](#), [PIXELATOR MINI MK2](#), [PLINK INJECTOR](#) & [IP PLINK INJECTOR](#) — use the protocols listed below.

Protocol	Clock Type	Color Resolution	Physical Package	RGB	RGBW	Voltage	PWM Rate	Suitable Camera	Redundancy
APA102	Clocked	8 Bits	SMD5050 with integrated LEDs	✓	✗	5V	1920Hz	Up to 67fps	✗
APA102C	Clocked	8 Bits	SMD5050 with integrated LEDs	✓	✗	5V	1920Hz	Up to 67fps	✗
APA104	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5 - 12V	400Hz	Unsuitable for cameras	✗
APA105	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5 - 24V	1200Hz	Up to 40fps	✗
APA109	Data-Only	8 Bits	SMD5050 with integrated LEDs	✗	✓	5V	1200Hz	Up to 40fps	✗
Adafruit Pixie	Data-Only	8 Bits	-	✓	✓	5 - 24V	500Hz	Unsuitable for cameras	✗
CS8812	Data-Only	8 Bits	SOP8 or SMD5050 with integrated LEDs	✓	✗	12V	8000Hz	Up to 267fps	✓
DM412	Clocked	16 Bits	SOP16	✓	✓	5V	-	-	✗
FW1906	Data-Only	8 Bits	SOP10	✓	✗	5 - 24V	2600Hz	Up to 86fps	✗
GS8206	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	8000Hz	Up to 267fps	✓
GS8208	Data-Only	8 Bits	SOP8	✓	✗	12V	8000Hz	Up to 267fps	✓
HD107S	Clocked	8 Bits	SMD5050 with integrated LEDs	✓	✗	5V	2600Hz	Up to 87fps	✗
HD108	Clocked	16 Bits	SMD5050 with integrated LEDs	✓	✗	5V	27,000Hz	Up to 900fps	✗
ICND2110	Clocked	16 Bits	QFN20	✓	✗	5 - 10V	3840Hz	Up to 128fps	✗
INK1003	Data-Only	8 Bits	SOP8	✓	✗	5 - 12V	400Hz	Unsuitable for cameras	✗
LB1908	Data-Only	8 Bits	SOP8	✓	✗	12V	8000Hz	Up to 266fps	✓
LPD6803	Clocked	5 Bits	SOP16	✓	✗	5 - 12V	1000Hz	Up to 34fps	✗
LPD8803	Clocked	8 Bits	SOP16	✓	✗	5 - 12V	4000Hz	Up to 134fps	✗
LPD8806	Clocked	8 Bits	SOP16	✓	✗	5 - 12V	4000Hz	Up to 134fps	✗
MBI6020	Clocked	10 Bits	SOP16	✓	✗	5 - 12V	9766Hz	Up to 326fps	✗
MBI6023	Clocked	10 Bits	SOP24	✓	✗	5 - 12V	11,718Hz	Up to 391fps	✗
MY9221	Clocked	16 Bits	SOP24	✓	✗	5 - 24V	1000Hz	Up to 34fps	✗
MY9231	Clocked	16 Bits	SOP16	✓	✗	5 - 24V	2000Hz	Up to 67fps	✗
MY9291	Clocked	16 Bits	SOP20	✓	✓	5 - 24V	2000Hz	Up to 67fps	✗
NS108E	Clocked	16 Bits	SMD5050 with integrated LEDs	✓	✗	5V	4000Hz	Up to 134fps	✗

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Protocol	Clock Type	Color Resolution	Physical Package	RGB	RGBW	Voltage	PWM Rate	Suitable Camera	Redundancy
P9412	Data-Only	8 Bits	SMD5050 with integrated LEDs	✗	✓	5 - 24V	1200Hz	Up to 40fps	✗
P943	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5 - 17V	1600Hz	Up to 53fps	✓
P9813	Clocked	8 Bits	SOP14	✓	✗	5 - 24V	4500Hz	Up to 150fps	✗
P9883	Data-Only	8 Bits	ESOP8	✓	✗	5 - 17V	1600Hz	Up to 53fps	✓
QED3001	Data-Only	12 Bits	SOP8/10/14	✓	✗	5 - 32V	1000Hz	Up to 34fps	✓ (SOP14 only)
SK6805	Data-Only	8 Bits	SMD2427/5050 with integrated LEDs	✓	✓	5V	1200Hz	Up to 40fps	✗
SK6812	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✓	5V	1200Hz	Up to 40fps	✗
SK6813	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5V	1200Hz	Up to 40fps	✗
SK6818	Data-Only	8 Bits	SMD5050 with integrated LEDs	✗	✓	5V	1200Hz	Up to 40fps	✗
SK6822	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5V	1200Hz	Up to 40fps	✓
SK9822	Clocked	8 Bits	SMD5050 with integrated LEDs	✓	✗	5V	4600Hz	Up to 154fps	✗
SM16703	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	1200Hz	Up to 40fps	✗
SM16704	Data-Only	8 Bits	SOP8	✗	✓	5 - 24V	1200Hz	Up to 40fps	✗
SM16712	Data-Only	8 Bits	SOP16	✓	✗	5 - 24V	1200Hz	Up to 40fps	✗
SM16714	Data-Only	8 Bits	SOP8	✗	✓	5 - 15V	1000Hz	Up to 34fps	✗
SM16716	Clocked	8 Bits	SOP16	✓	✗	5 - 24V	2500Hz	Up to 84fps	✗
SM16803	Data-Only	8 Bits	SOP8	✓	✗	5 - 30V	4000Hz	Up to 133fps	✗
SM16804	Data-Only	8 Bits	SOP8	✗	✓	5 - 30V	4000Hz	Up to 133fps	✗
TLS3001	Data-Only	12 Bits	SOP8/10/14	✓	✗	5 - 17V	1000Hz	Up to 34fps	✓ (SOP14 only)
TM1803	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	400Hz	Unsuitable for cameras	✗
TM1804	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	400Hz	Unsuitable for cameras	✗
TM1809	Data-Only	8 Bits	SOP14	✓	✗	5 - 24V	400Hz	Unsuitable for cameras	✗
TM1814	Data-Only	8 Bits	SOP8	✗	✓	5 - 32V	1000Hz	Up to 34fps	✗
TM1824	Data-Only	8 Bits	SOP8	✗	✓	5 - 24V	1000Hz	Up to 33fps	✗
TM1829	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	7000Hz	Up to 234fps	✗

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Protocol	Clock Type	Color Resolution	Physical Package	RGB	RGBW	Voltage	PWM Rate	Suitable Camera	Redundancy
TM1903	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	666Hz	Up to 23fps	✗
TM1914	Data-Only	8 Bits	SOP10	✓	✗	5 - 24V	666Hz	Up to 23fps	✓
TM1934	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	666Hz	Up to 23fps	✓
TX1818	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	12V	8000Hz	Up to 266fps	✓
UCS1903	Data-Only	8 Bits	SOP8	✓	✗	5 - 12V	400Hz	Unsuitable for cameras	✗
UCS1904	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	1500Hz	Up to 50fps	✗
UCS2603	Data-Only	8 Bits	SOP8	✓	✗	5 - 28V	8000Hz	Up to 267fps	✓
UCS2903	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	1600Hz	Up to 54fps	✗
UCS2904	Data-Only	8 Bits	SOP8	✗	✓	5 - 24V	1800Hz	Up to 60fps	✗
UCS2912	Data-Only	8 Bits	SOP16	✓	✗	5 - 24V	1600Hz	Up to 54fps	✗
UCS5603	Data-Only	12 Bits	SOP8	✓	✗	5 - 30V	1000Hz	Up to 34fps	✓
UCS7604	Data-Only	16 Bits	SOP10	✓	✓	5 - 30V	16,000Hz	Up to 533fps	✓
UCS7804	Data-Only	8 Bits	SOP8	✓	✓	5 - 30V	16,000Hz	Up to 533fps	✗
UCS8903	Data-Only	16 Bits	SOP8	✓	✗	5 - 24V	1000Hz	Up to 34fps	✗
UCS8904	Data-Only	16 Bits	SOP8	✗	✓	5 - 24V	UCS8904A: 1000Hz UCS8904B: 4000Hz	UCS8904A: Up to 34fps UCS8904B: Up to 133fps	✗
UCS9812	Data-Only	16 Bits	SOP16	✓	✗	5 - 24V	1024Hz	Up to 35fps	✗
WS2801	Clocked	8 Bits	SOP14	✓	✗	5V	2500Hz	Up to 84fps	✗
WS2808	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	12V	2000Hz	Up to 67fps	✓
WS2811	Data-Only	8 Bits	SOP8	✓	✗	5 - 12V	400Hz	Unsuitable for cameras	✗
WS2811 V1.4	Data-Only	8 Bits	SOP8	✓	✗	5 - 12V	2000Hz	Up to 67fps	✗
WS2812	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5 - 12V	400Hz	Unsuitable for cameras	✗
WS2812B	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5 - 12V	400Hz	Unsuitable for cameras	✗
WS2813	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	5 - 12V	2000Hz	Up to 67fps	✓
WS2814	Data-Only	8 Bits	SOP12	✗	✓	5 - 12V	2000Hz	Up to 67fps	✓

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WS2815	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	12V	2000Hz	Up to 67fps	✓
WS2815B	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✓	12V	2000Hz	Up to 67fps	✓
WS2816A	Data-Only	16 Bits	SMD5050 with integrated LEDs	✓	✗	5V	10,000Hz	Up to 333fps	✓
WS2816B	Data-Only	16 Bits	SMD5050 with integrated LEDs	✓	✗	5V	10,000Hz	Up to 333fps	✓
WS2816C	Data-Only	16 Bits	SMD5050 with integrated LEDs	✓	✗	5V	10,000Hz	Up to 333fps	✓
WS2818	Data-Only	8 Bits	SOP8	✓	✗	5 - 24V	2000Hz	Up to 67fps	✓
WS2818A	Data-Only	8 Bits	SOP8	✓	✗	5V	2000Hz	Up to 67fps	✓
WS2818B	Data-Only	8 Bits	SOP8	✓	✗	5 - 12V	2000Hz	Up to 67fps	✓
WS2851	Data-Only	8 Bits	SMD5050 with integrated LEDs	✓	✗	12V	400Hz	Unsuitable for cameras	✗