Colorlight

i8

Receiving Card

Specification

Overview

i8 is a high-end receiving card developed for fine-pitch LED screens featuring a large load capacity and up to 32 parallel data groups or 128 serial data groups. Due to its small form factor, i8 is best fit into concise cabinets. With DDR2 SODIMM interface, it can be effortlessly integrated into the HUBs and the display modules, allows for flexible screen design.

i8 not only has all the functions of mainstream receiving cards, but also a series of practical and powerful features helping high-end displays to maximize video performance with stunning clarity. i8 can be perfectly used in high-end rentals as well as fine-pitch fix-installed LED screens.

Features

Display effect

- 8bit/10bit video source input.
- HDR10 and HLG.
- Full gamma independent adjustment.
- Infi-bit grayscale compensation technology.
- Low latency.
- Color temperature adjustment.
- Grayscale refinement.
- Better gray at low brightness.

Correction processing

- High precise per-pixel calibration in brightness and chromaticity.

Easy maintenance

- Seam correction.
- Highlight and OSD.
- Color gamut adjustment.
- Screen rotation.
- Prestore picture.
- Firmware upgrade without power restart.
- 8-way, up to 16 intelligent modules.
- Quick firmware upgrade and calibration coefficients download.
- Cabinet temperature, humidity, voltage and power monitoring.

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- Irregular module, 4 modules with different wiring.

Stable and reliable

- Loop redundancy.
- Dual receiving card hot backup.
- PSU redundancy.
- Configuration parameter redundancy.
- Calibration coefficient redundancy.
- Firmware redundancy and readback.
- Ethernet cable status monitoring.
- 7×24h uninterrupted work.

Feature details

Display effect	
10bit	Maximum 10bit color depth video input and output, it presents a grayscale 4 times the normal 8bit video source, which offers smoother screen grayscale transition.
HDR	With the support of HDR master control, HDR display of various HDR10 / HLG standards can be realized, presenting images with high dynamic range, high contrast and wide color gamut.
Frame rate	Supports not only conventional and non-integer frame rates such as 23.98/24/29.97/30/50/59.94/60Hz, but also outputs and displays 120/144/240Hz high frame rate images, greatly improving picture smoothness and reducing smearing. (This feature affects the load capacity).
Better gray at low brightness	By optimizing the gamma meter algorithm, the display screen can maintain the integrity and perfect display of gray scale when reducing the brightness, showing the display effect of low brightness and high gray scale.
14bit calibration	Supports the 14bit calibration coefficients, and real-time processing of the calibration coefficient according to the actual playback content to improve the uniformity and consistency of the screen body at different gray levels.
Infi-bit	The use of dynamic compensation grayscale technology can significantly increase the grayscale of the LED display, effectively improving the details of the low-gray picture, making the grayscale transition smoother and the display effect more perfect.
Shortcuts	
Cabinet highlight	Mark quickly a target cabinet, by displaying a flashing rectangle indicator on the cabinet screen, which greatly facilitates front and rear maintenance.
Quick OSD	Mark quickly the index of a receiving card corresponding to a specific Ethernet port, allow for setting up the connection relationship of the screen easily.

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Seam correction	Quickly and efficiently eliminate the perceptible bright and dark lines caused by physical screen splicing. It can be used repeatedly in rental scenarios, thanks to its advanced one-click reset feature.
Color adjustment	Allow you to quickly and easily adjust the color gamut of individual cabinet or screen. Support customized adjustment and one-click restore. Achieve high-precision color reproduction in combination with the use of the photometer.
Image rotation	Support the single cabinet image to be rotated at 90°/180°/270° angles, and with part of the main control, the single cabinet image can be rotated and displayed at any angle.
Prestore picture	Offering customizable picture display on the LED screen when there is no video signal.
Irregular module	It supports 4 modules with different wiring, which is convenient for users to use modules heterogeneously. Restriction: 1 scan (including cascade) supports a maximum of 1024 pixels, and the scan lines in the same data group must be consistent. When using 1~2 types of routing tables, a single set of data sets supports a maximum of 1024 pixels per scan; when using 3~4 types of routing tables, a single set of data sets supports a maximum of 512 pixels per scan.
Hardware monitoring	
Bit error detection	Quickly identify the cabinet with abnormal connection, thanks to the feature of data transmission quality detection between receiving card and LED sender.
Temperature monitoring	Monitor the cabinet (need the support from the cabinet design), and send to the computer in real-time the running cabinet temperature. With the software, users can monitor current temperature and be alerted on any abnormal condition.
Humidity monitoring	Monitor the cabinet (need the support from the cabinet design), and send to the computer in real-time the running cabinet humidity. With the software, users can monitor current humidity and be alerted on any abnormal condition.
Power supply monitoring	It supports the monitoring of 4-way power supply of the cabinet (requires cabinet design), which can be sent back to the upper computer in real time, can be viewed on the software, and supports the reminder of abnormal power status.
Voltage monitoring	It supports the monitoring of the power supply voltage of the box (requires cabinet design), which can be sent back to the host computer in real time. It can monitor the voltage status of 3-way of external power supply at the same time and monitor the voltage of 1-way of the receiving card itself. It supports software to check the voltage monitoring value.
Pixel-by-pixel monitoring	Monitoring cabinet pixel health (need the support from the cabinet design), and send to the computer in real-time each pixel status. With the software, users can check current pixels status and be alerted on the amount of bad pixels above a predefined threshold.
LCD monitoring	Display on the cabinet LCD screen the temperature, voltage, running time and other status, support one-click self-test.
Redundancy	

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Loop redundancy	The receiving card switches signal source to the other Ethernet port, when one receiving channel fail, maintaining the normal display of the LED screen.
Receiving card hot backup	Two receiving cards connect to the HUB board to control a single cabinet at the same time. When the main receiving card is abnormal, the backup card will take over the display immediately.
Firmware redundancy	Support firmware backup. Users can safely upgrade firmware without worrying about losing firmware due to cable disconnections or power failure during the upgrade process.
Configuration parameter redundancy	Provide two sets of configuration parameters in the receiving card, one of them serves as backup parameter.
Calibration coefficient redundancy	The calibration coefficient is stored both in the factory area and user area of the receiving card simultaneously. The coefficient in the user area is used by default, but users can restore the calibration coefficient from the factory area to the user area at any time.

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Basic parameters

Control System Parameters	
Load Capacity	Maximum 512x384 pixels.[1]
Ethernet Port Exchange	Supported, arbitrary use
Grayscale	Up to 65536 grayscale.
Display Module Compatibility	
Chip Support	PWM chips
Scan Type	Up to 128 scan lines.
Module Dimension	Up to 1024 pixels per data group.
Cable Direction	Route from left to right, from right to left, from top to bottom, from bottom to top.
Data Group	32 groups of parallel RGB full color data and 128 groups of serial RGB data, data groups can be exchanged freely
Data Fold	Horizontal or vertical 2~12 folds.
Module pumping point, row and column	Any pumping point and any pumping row and any pumping column.
Monitoring Function (work with the module with corresponding sensor)	
Temperature Monitoring	Temperature of receiver cards: -25°C~75°C, no need for peripherals. 1 port for each card
Humidity Monitoring	Measuring range: 25%~95%RH. 1 port for each card.
Power Supply Monitoring	Monitor the working status of the power supply. 4 ports for each card.
Voltage Monitoring	Monitoring the voltage of the cabinet power supply, 3 monitoring ports available each card. Monitor receiving card's own voltage is built-in.
Net cable Monitoring	Operating total number of packets, error packets and network quality.
Pixel-by-Pixel Calibration	
Brightness Calibration	Up to 14bit calibration accuracy.
Chromaticity Calibration	Up to 14bit calibration accuracy.
Other features	
Redundancy	Loop redundancy, receiving card redundancy, PSU redundancy, firmware redundancy, configuration parameter redundancy and calibration coefficient redundancy.
Optional functions	Cabinet LCD display, module hot swap, irregular screen design etc.

[1] The load capacity may vary on some feature enabled.

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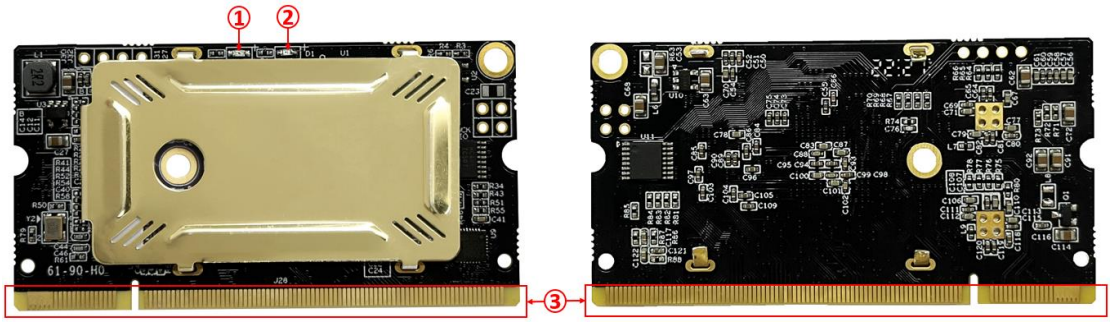
Hardware

Appearance



Interface

S/N	Name	Function	
1	Signal indicator	Flashes once per second	Receiving card: normal. Ethernet cable connection: normal.
		Flashes 10 times per second	Receiving card: normal. Cabinet: Highlight.
		Flashes 4 times per second	Receiving card: working with back up channel (Loop redundancy status).
2	Power indicator	Red indicator always on: the power supply is normal.	
3	Gold finger interface	Used to connect with the HUB or unit board. From the diagram above, the left side of the guide plate is first pin (Viewing from the front of card).	

* i8 uses DDR2 SODIMM socket, please refer to the connector specification for details. The product photos in this article are for reference only.

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Equipment Specifications

Physical specifications	
Hardware interface	DDR2 SODIMM socket
Ethernet port transmission rate	1Gb/s
Communication Distance	Recommended: CAT5e cable≤100m
Compatible with Transmission Equipment	Gigabit switch, Gigabit fiber converter, Gigabit fiber switch
Size	L×W×H / 67.6mm(2.7")×35.5mm(1.4")×4.5mm(0.2")
Weight	10g / 0.02lbs, with heat sink.
Electrical specification	
Voltage	DC 3.8~5.5V, 0.6A
Rated power	3.0W
Body Static Resistance	2KV
Operating environment	
Temperature	-25°C~75°C (-13°F~167°F)
Humidity	0%RH-80%RH, no condensation
Storage and transport environment	
Temperature	-40°C~125°C (-40°F~257°F)
Humidity	0%RH-90%RH, no condensation
Packing information	
Packaging rules	Standard blister box device, 6 cards per box, 600 cards per carton
Package size	L×W×H / 550.0mm (21.7")×398.0mm(15.7")×180.0mm(7.1")
Certification	
* RoHS certification, EMC Class A certification, EMC needs to work with the cabinet design, please contact technical support for assistance.	

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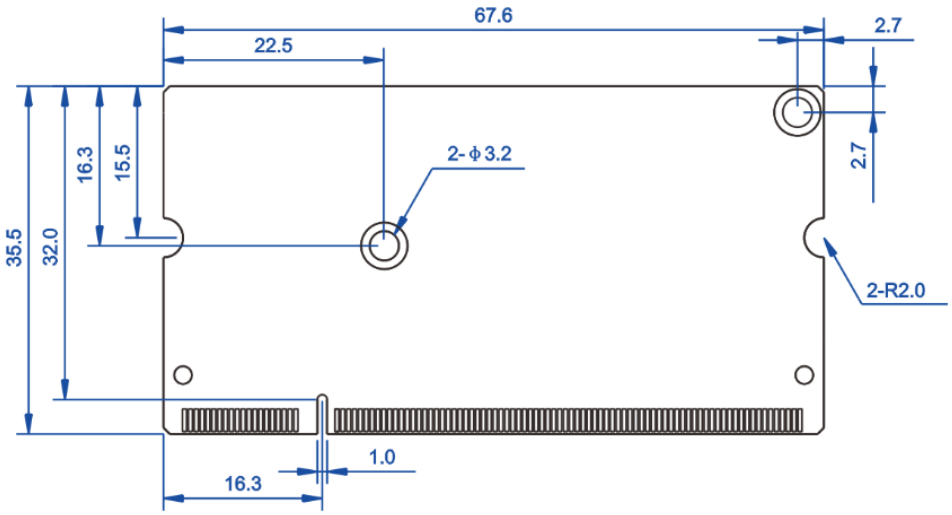
Reference dimensions

Unit: mm

Tolerance: ±0.3mm



*Studs are not recommended for further fixing.

*If you need to use studs, please contact technical support.

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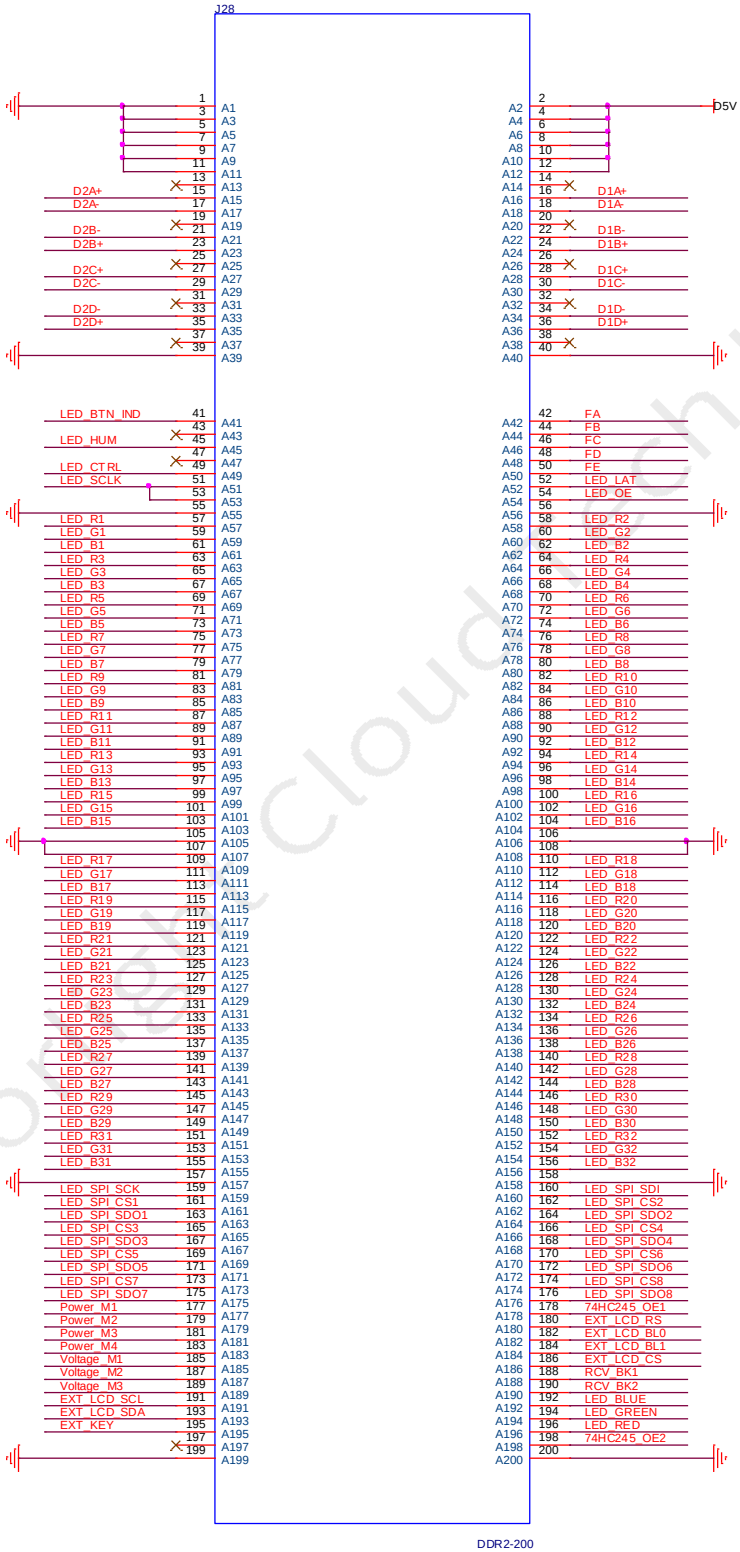
Definition of Pins

32 groups of parallel data interfaces



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Instructions	Definition	Pin No.		Definition	Instructions
Ground connection	GND	1	2	D5V	Power supply
	GND	3	4	D5V	
	GND	5	6	D5V	
	GND	7	8	D5V	
	GND	9	10	D5V	
	GND	11	12	D5V	
Empty	NC	13	14	NC	Empty
Ethernet port 2 signal pin	D2A+	15	16	D1A+	Ethernet port 1 signal pin
	D2A-	17	18	D1A-	
	NC	19	20	NC	
	D2B-	21	22	D1B-	
	D2B+	23	24	D1B+	
	NC	25	26	NC	
	D2C+	27	28	D1C+	
	D2C-	29	30	D1C-	
	NC	31	32	NC	
	D2D-	33	34	D1D-	
	D2D+	35	36	D1D+	
Empty	NC	37	38	NC	Empty
Ground connection	GND	39	40	GND	Ground connection
Indicator, reuse button	LED_BTN_IND	41	42	FA	Row decoding signal
Empty	NC	43	44	FB	
Humidity monitoring	LED_HUM	45	46	FC	
Empty	NC	47	48	FD	
Blanking	LED_CTRL	49	50	FE	
Serial clock	LED_SCLK	51	52	LED_LAT	Latch
		53	54	LED_OE	Display enable, it is GCLK when the LED display use PWM chips
Ground connection	GND	55	56	GND	Ground connection
RGB output	LED_R1	57	58	LED_R2	RGB output
	LED_G1	59	60	LED_G2	
	LED_B1	61	62	LED_B2	
	LED_R3	63	64	LED_R4	
	LED_G3	65	66	LED_G4	
	LED_B3	67	68	LED_B4	
	LED_R5	69	70	LED_R6	

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	LED_G5	71	72	LED_G6	
	LED_B5	73	74	LED_B6	
	LED_R7	75	76	LED_R8	
	LED_G7	77	78	LED_G8	
	LED_B7	79	80	LED_B8	
	LED_R9	81	82	LED_R10	
	LED_G9	83	84	LED_G10	
	LED_B9	85	86	LED_B10	
	LED_R11	87	88	LED_R12	
	LED_G11	89	90	LED_G12	
	LED_B11	91	92	LED_B12	
	LED_R13	93	94	LED_R14	
	LED_G13	95	96	LED_G14	
	LED_B13	97	98	LED_B14	
	LED_R15	99	100	LED_R16	
	LED_G15	101	102	LED_G16	
	LED_B15	103	104	LED_B16	
Ground connection	GND	105	106	GND	Ground connection
	GND	107	108	GND	
RGB output	LED_R17	109	110	LED_R18	RGB output
	LED_G17	111	112	LED_G18	
	LED_B17	113	114	LED_B18	
	LED_R19	115	116	LED_R20	
	LED_G19	117	118	LED_G20	
	LED_B19	119	120	LED_B20	
	LED_R21	121	122	LED_R22	
	LED_G21	123	124	LED_G22	
	LED_B21	125	126	LED_B22	
	LED_R23	127	128	LED_R24	
	LED_G23	129	130	LED_G24	
	LED_B23	131	132	LED_B24	
	LED_R25	133	134	LED_R26	
	LED_G25	135	136	LED_G26	
	LED_B25	137	138	LED_B26	
	LED_R27	139	140	LED_R28	
	LED_G27	141	142	LED_G28	
	LED_B27	143	144	LED_B28	
	LED_R29	145	146	LED_R30	
	LED_G29	147	148	LED_G30	
	LED_B29	149	150	LED_B30	
	LED_R31	151	152	LED_R32	
	LED_G31	153	154	LED_G32	
	LED_B31	155	156	LED_B32	

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Ground connection	GND	157	158	GND	Ground connection
Smart module (Save calibration coefficients in module)	LED_SPI_SCK	159	160	LED_SPI_SDI	Smart module (Save calibration coefficients in module)
	LED_SPI_CS1	161	162	LED_SPI_CS2	
	LED_SPI_SDO1	163	164	LED_SPI_SDO2	
	LED_SPI_CS3	165	166	LED_SPI_CS4	
	LED_SPI_SDO3	167	168	LED_SPI_SDO4	
	LED_SPI_CS5	169	170	LED_SPI_CS6	
	LED_SPI_SDO5	171	172	LED_SPI_SDO6	
	LED_SPI_CS7	173	174	LED_SPI_CS8	
	LED_SPI_SDO7	175	176	LED_SPI_SDO8	
Power supply monitoring	Power_M1	177	178	75HC245_OE1	Extension of 16-channel of smart module, 245 enable
	Power _M2	179	180	EXT_LCD_RS	LCD screen interface
	Power _M3	181	182	EXT_LCD_BL0	
	Power _M4	183	184	EXT_LCD_BL1	
Power Voltage monitoring	Voltage_M1	185	186	EXT_LCD_CS	
	Voltage_M2	187	188	RCV_BK1	Dual card backup identification signal
	Voltage_M3	189	190	RCV_BK2	Dual card backup connection signal
LCD screen interface	EXT_LCD_SCL	191	192	LED_BLUE	LED RGB indicator
	EXT_LCD_SDA	193	194	LED_GREEN	
	EXT_KEY	195	196	LED_RED	
Empty	NC	197	198	75HC245_OE2	Extension of 16-channel smart module, 245 enable
Ground connection	GND	199	200	GND	Ground connection

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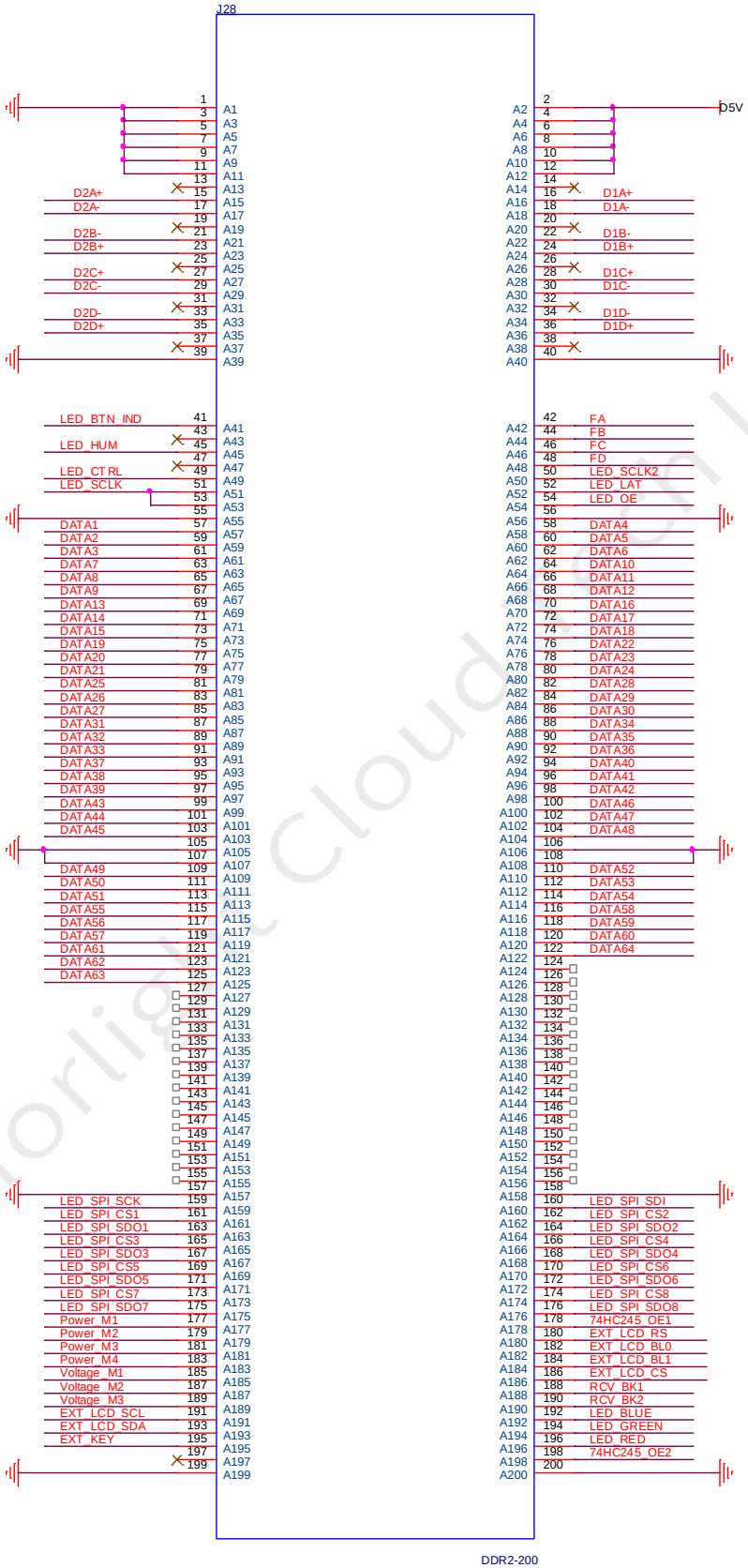
128 groups of serial data interfaces



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Instructions	Definition	Pin No.		Definition	Instructions
Ground connection	GND	1	2	D5V	Power supply
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	GND	7	8	D5V	
	GND	9	10	D5V	
	GND	11	12	D5V	
Empty	NC	13	14	NC	Empty
Ethernet port 2 signal pin	D2A+	15	16	D1A+	Ethernet port 1 signal pin
	D2A-	17	18	D1A-	
	NC	19	20	NC	
	D2B-	21	22	D1B-	
	D2B+	23	24	D1B+	
	NC	25	26	NC	
	D2C+	27	28	D1C+	
	D2C-	29	30	D1C-	
	NC	31	32	NC	
	D2D-	33	34	D1D-	
	D2D+	35	36	D1D+	
Empty	NC	37	38	NC	Empty
Ground connection	GND	39	40	GND	Ground connection
Indicator, reuse button	LED_BTN_IND	41	42	FA	Row decoding signal
Empty	NC	43	44	FB	
Humidity monitoring	LED_HUM	45	46	FC	
Empty	NC	47	48	FD	
Blanking	LED_CTRL	49	50	LED_SCLK2	Serial clock 2
Serial clock 1	LED_SCLK	51	52	LED_LAT	Latch
		53	54	LED_OE	Display enable, it is GCLK when the LED display use PWM chips
Ground connection	GND	55	56	GND	Ground connection
RGB output	DATA1	57	58	DATA4	RGB output
	DATA2	59	60	DATA5	
	DATA3	61	62	DATA6	
	DATA7	63	64	DATA10	
	DATA8	65	66	DATA11	
	DATA9	67	68	DATA12	
	DATA13	69	70	DATA16	

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	DATA14	71	72	DATA17	
	DATA15	73	74	DATA18	
	DATA19	75	76	DATA22	
	DATA20	77	78	DATA23	
	DATA21	79	80	DATA24	
	DATA25	81	82	DATA28	
	DATA26	83	84	DATA29	
	DATA27	85	86	DATA30	
	DATA31	87	88	DATA34	
	DATA32	89	90	DATA35	
	DATA33	91	92	DATA36	
	DATA37	93	94	DATA40	
	DATA38	95	96	DATA41	
	DATA39	97	98	DATA42	
	DATA43	99	100	DATA46	
	DATA44	101	102	DATA47	
	DATA45	103	104	DATA48	
Ground connection	GND	105	106	GND	Ground connection
	GND	107	108	GND	
RGB output	DATA49	109	110	DATA52	RGB output
	DATA50	111	112	DATA53	
	DATA51	113	114	DATA54	
	DATA55	115	116	DATA58	
	DATA56	117	118	DATA59	
	DATA57	119	120	DATA60	
	DATA61	121	122	DATA64	
	DATA62	123	124	NC	Empty
	DATA63	125	126	NC	
Empty	NC	127	128	NC	
	NC	129	130	NC	
	NC	131	132	NC	
	NC	133	134	NC	
	NC	135	136	NC	
	NC	137	138	NC	
	NC	139	140	NC	
	NC	141	142	NC	
	NC	143	144	NC	
	NC	145	146	NC	
	NC	147	148	NC	
	NC	149	150	NC	
	NC	151	152	NC	
	NC	153	154	NC	

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	NC	155	156	NC	
Ground connection	GND	157	158	GND	Ground connection
Smart module (Save calibration coefficients in module)	LED_SPI_SCK	159	160	LED_SPI_SDI	Smart module (Save calibration coefficients in module)
	LED_SPI_CS1	161	162	LED_SPI_CS2	
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	LED_SPI_CS3	165	166	LED_SPI_CS4	
	LED_SPI_SDO3	167	168	LED_SPI_SDO4	
	LED_SPI_CS5	169	170	LED_SPI_CS6	
	LED_SPI_SDO5	171	172	LED_SPI_SDO6	
	LED_SPI_CS7	173	174	LED_SPI_CS8	
	LED_SPI_SDO7	175	176	LED_SPI_SDO8	
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	Voltage_M2	187	188	RCV_BK1	Dual card backup identification signal
	Voltage_M3	189	190	RCV_BK2	Dual card backup connection signal
Extension port LCD screen interface	EXT_LCD_SCL	191	192	LED_BLUE	LED RGB indicator
	EXT_LCD_SDA	193	194	LED_GREEN	
	EXT_KEY	195	196	LED_RED	
Empty	NC	197	198	75HC245_OE2	Extension of 16-channel smart module, 245 enable
Ground connection	GND	199	200	GND	Ground connection

* FE and LED_SCLK2 are signal multiplexing pins, which are used as row decoding signals in parallel data and as the second serial clock in serial data to achieve 128 sets of serial data expansion, DATA65~DATA128 correspond to multiplexing DATA1 Interface data for ~DATA64.

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