





































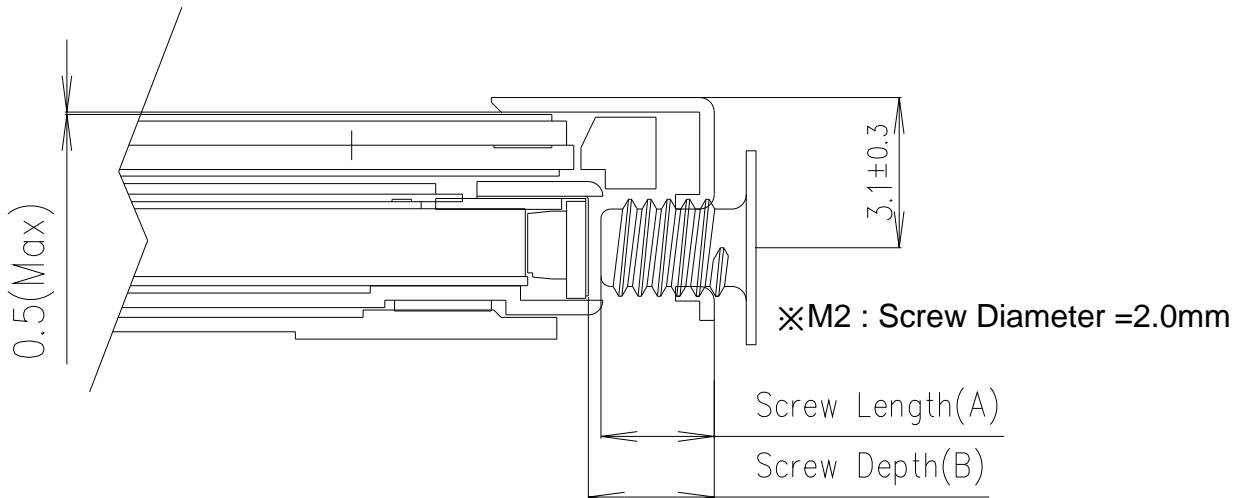






Product Specification

[ DETAIL DESCRIPTION OF SIDE MOUNTING SCREW ]



- \* Mounting Screw Length (A)  
= 2.0(Min) / 2.5(Max)
- \* Mounting Screw Hole Depth (B)  
= 2.5(Min)
- \* Mounting hole location : 3.1(Typ)
- \* Torque : 2.0 kgf.cm(Max)  
(Measurement gauge : torque meter)

Notes : 1. Screw plated through the method of non-electrolytic nickel plating is preferred to reduce possibility that results in vertical and/or horizontal line defect due to the conductive particles from screw surface.

## Product Specification

## 6. Reliability

Environment test condition

No.	Test Item	Conditions
1	High temperature storage test	Ta= 60°C, 240h
2	Low temperature storage test	Ta= -20°C, 240h
3	High temperature operation test	Ta= 50°C, 50%RH, 240h
4	Low temperature operation test	Ta= 0°C, 240h
5	Vibration test (non-operating)	Sine wave, 5 ~ 150Hz, 1.5G, 0.37oct/min 3 axis, 1hour/axis
6	Shock test (non-operating)	Half sine wave, 180G, 2ms one shock of each six faces(l.e. run 180G 2ms for all six faces)
7	Altitude operating storage / shipment	0 ~ 10,000 feet (3,048m) 24Hr 0 ~ 40,000 feet (12,192m) 24Hr

{ Result Evaluation Criteria }

There should be no change which might affect the practical display function when the display quality test is conducted under normal operating condition.

## 7. International Standards

### 7-1. Safety

- a) UL 60950-1, Second Edition, Underwriters Laboratories Inc.  
Information Technology Equipment - Safety - Part 1 : General Requirements.
- b) CAN/CSA C22.2 No.60950-1-07, Second Edition, Canadian Standards Association.  
Information Technology Equipment - Safety - Part 1 : General Requirements.
- c) EN 60950-1:2006 + A11:2009, European Committee for Electrotechnical Standardization (CENELEC).  
Information Technology Equipment - Safety - Part 1 : General Requirements.
- d) IEC 60950-1:2005, Second Edition, The International Electrotechnical Commission (IEC).  
Information Technology Equipment - Safety - Part 1 : General Requirements.

### 7-2. EMC

- a) ANSI C63.4 "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz." American National Standards Institute (ANSI), 2003.
- b) CISPR 22 "Information technology equipment – Radio disturbance characteristics – Limit and methods of measurement." International Special Committee on Radio Interference (CISPR), 2005.
- c) CISPR 13 "Sound and television broadcast receivers and associated equipment – Radio disturbance characteristics – Limits and method of measurement." International Special Committee on Radio Interference (CISPR), 2006.

### 7-3. Environment

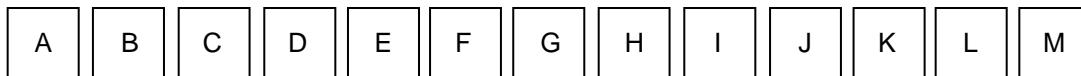
- a) RoHS, Directive 2002/95/EC of the European Parliament and of the council of 27 January 2003

Product Specification

## 8. Packing

### 8-1. Designation of Lot Mark

a) Lot Mark



A,B,C : SIZE(INCH)  
E : MONTH

D : YEAR  
F ~ M : SERIAL NO.



Note

1. YEAR

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Mark	A	B	C	D	E	F	G	H	J	K

2. MONTH

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mark	1	2	3	4	5	6	7	8	9	A	B	C

b) Location of Lot Mark

Serial No. is printed on the label. The label is attached to the backside of the LCD module.  
This is subject to change without prior notice.

### 8-2. Packing Form


a) Package quantity in one box : 22 pcs

b) Box Size :478 x 365 x 288

Product Specification

# APPENDIX-1

■ Box Label


LP156WH2	
TLH2	
22 PCS	001/12-30
MADE IN CHINA	RoHS Verified
 XXXXXXXXXXXXXXXX XXX	

Quantity

Shipping date  
(12-30 : 月-日)

LGD Lot Mark

■ Pallet Label

LP156WH2	
TLH2	
396 PCS	001/12-30
MADE IN CHINA	RoHS Verified
 XXXXXXXXXXXXXXXX XXX	

Quantity

Shipping date  
(12-30 : 月-日)

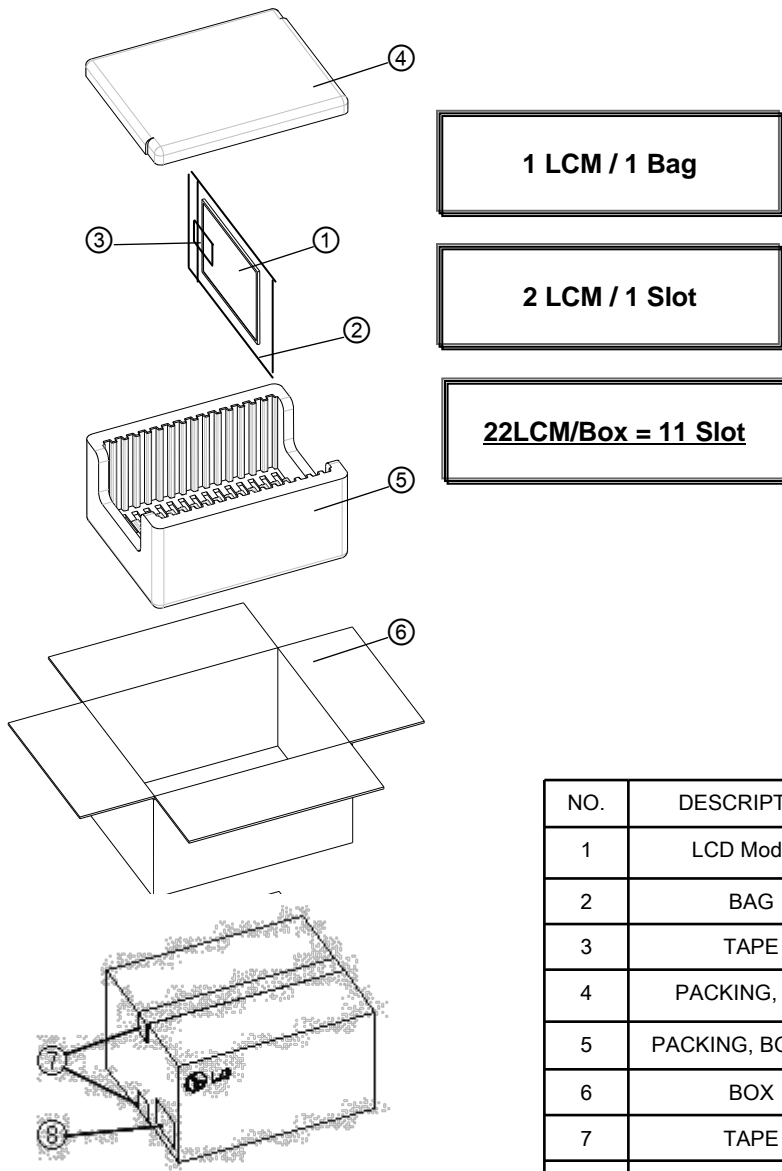
LGD Lot Mark



**Product Specification**

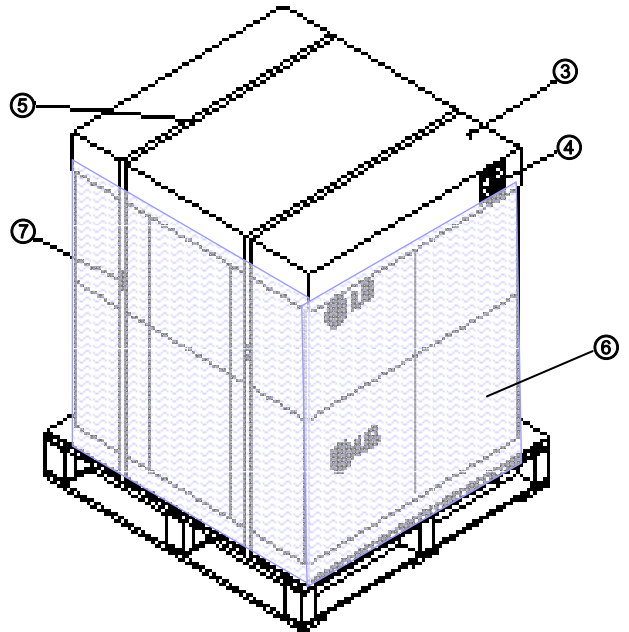
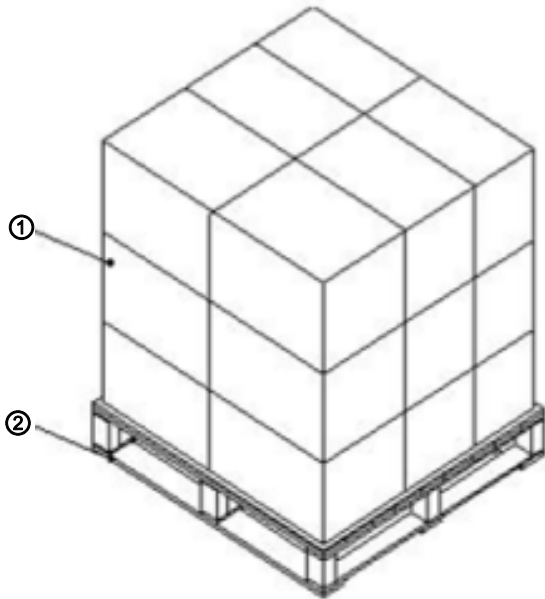
# APPENDIX-2

■ Packing Assembly



# APPENDIX-3

■ Pallet Assembly



NO.	DESCRIPTION	MATERIAL
1	Packing AssY	
2	Pallet	Plywood
3	Angle Cover	SWR4
4	Label	ART 100X70
5	Band	PP
6	Wrap	LLDPE
7	CLIP	Steel

## 9. PRECAUTIONS

Please pay attention to the followings when you use this TFT LCD module.

### 9-1. MOUNTING PRECAUTIONS

- (1) You must mount a module using holes arranged in four corners or four sides.
- (2) You should consider the mounting structure so that uneven force (ex. Twisted stress) is not applied to the module. And the case on which a module is mounted should have sufficient strength so that external force is not transmitted directly to the module.
- (3) Please attach the surface transparent protective plate to the surface in order to protect the polarizer. Transparent protective plate should have sufficient strength in order to resist external force.
- (4) You should adopt radiation structure to satisfy the temperature specification.
- (5) Acetic acid type and chlorine type materials for the cover case are not desirable because the former generates corrosive gas of attacking the polarizer at high temperature and the latter causes circuit break by electro-chemical reaction.
- (6) Do not touch, push or rub the exposed polarizers with glass, tweezers or anything harder than HB pencil lead. And please do not rub with dust clothes with chemical treatment. Do not touch the surface of polarizer for bare hand or greasy cloth.(Some cosmetics are detrimental to the polarizer.)
- (7) When the surface becomes dusty, please wipe gently with absorbent cotton or other soft materials like chamois soaks with petroleum benzene. Normal-hexane is recommended for cleaning the adhesives used to attach front / rear polarizers. Do not use acetone, toluene and alcohol because they cause chemical damage to the polarizer.
- (8) Wipe off saliva or water drops as soon as possible. Their long time contact with polarizer causes deformations and color fading.
- (9) Do not open the case because inside circuits do not have sufficient strength.

### 9-2. OPERATING PRECAUTIONS

- (1) The spike noise causes the mis-operation of circuits. It should be lower than following voltage :  
 $V = \pm 200\text{mV}$ (Over and under shoot voltage)
- (2) Response time depends on the temperature.(In lower temperature, it becomes longer.)
- (3) Brightness depends on the temperature. (In lower temperature, it becomes lower.)  
And in lower temperature, response time(required time that brightness is stable after turned on) becomes longer.
- (4) Be careful for condensation at sudden temperature change. Condensation makes damage to polarizer or electrical contacted parts. And after fading condensation, smear or spot will occur.
- (5) When fixed patterns are displayed for a long time, remnant image is likely to occur.
- (6) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimized the interference.

### **9-3. ELECTROSTATIC DISCHARGE CONTROL**

Since a module is composed of electronic circuits, it is not strong to electrostatic discharge. Make certain that treatment persons are connected to ground through wrist band etc. And don't touch interface pin directly.

### **9-4. PRECAUTIONS FOR STRONG LIGHT EXPOSURE**

Strong light exposure causes degradation of polarizer and color filter.

### **9-5. STORAGE**

When storing modules as spares for a long time, the following precautions are necessary.

- (1) Store them in a dark place. Do not expose the module to sunlight or fluorescent light. Keep the temperature between 5°C and 35°C at normal humidity.
- (2) The polarizer surface should not come in contact with any other object.  
It is recommended that they be stored in the container in which they were shipped.

### **9-6. HANDLING PRECAUTIONS FOR PROTECTION FILM**

- (1) When the protection film is peeled off, static electricity is generated between the film and polarizer.  
This should be peeled off slowly and carefully by people who are electrically grounded and with well ion-blown equipment or in such a condition, etc.
- (2) The protection film is attached to the polarizer with a small amount of glue. If some stress is applied to rub the protection film against the polarizer during the time you peel off the film, the glue is apt to remain on the polarizer.  
Please carefully peel off the protection film without rubbing it against the polarizer.
- (3) When the module with protection film attached is stored for a long time, sometimes there remains a very small amount of glue still on the polarizer after the protection film is peeled off.
- (4) You can remove the glue easily. When the glue remains on the polarizer surface or its vestige is recognized, please wipe them off with absorbent cotton waste or other soft material like chamois soaked with normal-hexane.

Product Specification

APPENDIX A. Enhanced Extended Display Identification Data (EEDID™) 1/3

	Byte (Dec)	Byte (Hex)	Field Name and Comments	Value (Hex)	Value (Bin)
<b>Header</b>	0	00	Header	00	00000000
	1	01	Header	FF	11111111
	2	02	Header	FF	11111111
	3	03	Header	FF	11111111
	4	04	Header	FF	11111111
	5	05	Header	FF	11111111
	6	06	Header	FF	11111111
<b>Vendor / Product Version</b>	7	07	Header	00	00000000
	8	08	EISA manufacture code ( 3 Character ID ) LGD	30	00110000
	9	09	EISA manufacture code (Compressed ASCII )	E4	11100100
	10	0A	Panel Supplier Reserved - Product Code 036Eh	6E	01101110
	11	0B	( Hex, LSB first )	03	00000011
	12	0C	LCD Module Serial No - Preferred but Optional ("0" If not used)	00	00000000
	13	0D	LCD Module Serial No - Preferred but Optional ("0" If not used)	00	00000000
	14	0E	LCD Module Serial No - Preferred but Optional ("0" If not used)	00	00000000
	15	0F	LCD Module Serial No - Preferred but Optional ("0" If not used)	00	00000000
	16	10	Week of Manufacture 00 weeks	00	00000000
	17	11	Year of Manufacture 2011 years	15	00101010
<b>Display Parameter</b>	18	12	EDID structure version # = 1	01	00000001
	19	13	EDID revision # = 3	03	00000011
	20	14	Video input Definition = Digital signal	80	10000000
	21	15	Max H image size (Rounded cm) = 34 cm	22	00100010
	22	16	Max V image size (Rounded cm) = 19 cm	13	00100111
	23	17	Display gamma = (gamma*100)-100 = Example:(2.2*100)-100=120 = 2.2 Gamma	78	01111000
	24	18	Feature Support (no_DPMS, no_Active Off/Very Low Power, RGB color display, Timing BLK 1,no_GTF)	0A	00001010
	<b>Panel Color Coordinate</b>	25	19	Red/Green Low Bits (RxRy/GxGy)	0F
26		1A	Blue/White Low Bits (BxBY/WxWy)	95	10010101
27		1B	Red X Rx = 0.617	9E	10011110
28		1C	Red Y Ry = 0.371	5F	01011111
29		1D	Green X Gx = 0.347	58	01011000
30		1E	Green Y Gy = 0.608	9B	10011011
31		1F	Blue X Bx = 0.150	26	00100110
32		20	Blue Y By = 0.106	1B	00011011
33		21	White X Wx = 0.313	50	01010000
34		22	White Y Wy = 0.329	54	01010100
<b>Established</b>	35	23	Established timing 1 (00h if not used)	00	00000000
	36	24	Established timing 2 (00h if not used)	00	00000000
	37	25	Manufacturer's timings (00h if not used)	00	00000000
<b>Standard Timing ID</b>	38	26	Standard timing ID1 (01h if not used)	01	00000001
	39	27	Standard timing ID1 (01h if not used)	01	00000001
	40	28	Standard timing ID2 (01h if not used)	01	00000001
	41	29	Standard timing ID2 (01h if not used)	01	00000001
	42	2A	Standard timing ID3 (01h if not used)	01	00000001
	43	2B	Standard timing ID3 (01h if not used)	01	00000001
	44	2C	Standard timing ID4 (01h if not used)	01	00000001
	45	2D	Standard timing ID4 (01h if not used)	01	00000001
	46	2E	Standard timing ID5 (01h if not used)	01	00000001
	47	2F	Standard timing ID5 (01h if not used)	01	00000001
	48	30	Standard timing ID6 (01h if not used)	01	00000001
	49	31	Standard timing ID6 (01h if not used)	01	00000001
	50	32	Standard timing ID7 (01h if not used)	01	00000001
	51	33	Standard timing ID7 (01h if not used)	01	00000001
	52	34	Standard timing ID8 (01h if not used)	01	00000001
	53	35	Standard timing ID8 (01h if not used)	01	00000001

HY-LINE Computer Components / www.hy-line.de/computer

Product Specification

**APPENDIX A. Enhanced Extended Display Identification Data (EEDID™) 2/3**

	Byte (Dec)	Byte (Hex)	Field Name and Comments	Value (Hex)	Value (Bin)
<b>Timing Descriptor #1</b>	54	36	Pixel Clock/10,000 (LSB) 69.3 MHz @ 60Hz	12	00010010
	55	37	Pixel Clock/10,000 (MSB)	1B	00011011
	56	38	Horizontal Active (lower 8 bits) 1366 Pixels	56	01010110
	57	39	Horizontal Blanking(Thp-HA) (lower 8 bits) 118 Pixels	76	01110110
	58	3A	Horizontal Active / Horizontal Blanking(Thp-HA) (upper 4:4bits)	50	01010000
	59	3B	Vertical Active 768 Lines	00	00000000
	60	3C	Vertical Blanking (Tvp-HA) (DE Blanking typ.for DE only panels) 10 Lines	0A	00001010
	61	3D	Vertical Active : Vertical Blanking (Tvp-HA) (upper 4:4bits)	30	00110000
	62	3E	Horizontal Sync. Offset (Thfp) 36 Pixels	24	00100100
	63	3F	Horizontal Sync Pulse Width (HSPW) 48 Pixels	30	00110000
	64	40	Vertical Sync Offset(Tvfp) : Sync Width (VSPW) 3 Lines : 5 Lines	35	00110101
	65	41	Horizontal Vertical Sync Offset/Width (upper 2bits)	00	00000000
	66	42	Horizontal Image Size (mm) 344 mm	58	01011000
	67	43	Vertical Image Size (mm) 194 mm	C2	11000010
	68	44	Horizontal Image Size / Vertical Image Size	10	00010000
	69	45	Horizontal Border = 0 (Zero for Notebook LCD)	00	00000000
	70	46	Vertical Border = 0 (Zero for Notebook LCD)	00	00000000
71	47	Non-Interlace, Normal display, no stereo, Digital Separate ( Vsync_NEG, Hsync_NEG ), DE only note : LSB is set to '1' if panel is DE-timing only. H/V can be ignored.	19	00011001	
<b>Timing Descriptor #2</b>	72	48	Flag	00	00000000
	73	49	Flag	00	00000000
	74	4A	Flag	00	00000000
	75	4B	Data Type Tag (Descriptor Defined by manufacturer )	00	00000000
	76	4C	Flag	00	00000000
	77	4D	Descriptor Defined by manufacturer	00	00000000
	78	4E	Descriptor Defined by manufacturer	00	00000000
	79	4F	Descriptor Defined by manufacturer	00	00000000
	80	50	Descriptor Defined by manufacturer	00	00000000
	81	51	Descriptor Defined by manufacturer	00	00000000
	82	52	Descriptor Defined by manufacturer	00	00000000
	83	53	Descriptor Defined by manufacturer	00	00000000
	84	54	Descriptor Defined by manufacturer	00	00000000
	85	55	Descriptor Defined by manufacturer	00	00000000
	86	56	Descriptor Defined by manufacturer	00	00000000
	87	57	Descriptor Defined by manufacturer	00	00000000
	88	58	Descriptor Defined by manufacturer	00	00000000
89	59	Descriptor Defined by manufacturer	00	00000000	
<b>Timing Descriptor #3</b>	90	5A	Flag	00	00000000
	91	5B	Flag	00	00000000
	92	5C	Flag	00	00000000
	93	5D	Data Type Tag ( ASCII String )	FE	11111110
	94	5E	Flag	00	00000000
	95	5F	ASCII String L	4C	01001100
	96	60	ASCII String G	47	01000111
	97	61	ASCII String	20	00100000
	98	62	ASCII String D	44	01000100
	99	63	ASCII String i	69	01101001
	100	64	ASCII String s	73	01110011
	101	65	ASCII String p	70	01110000
	102	66	ASCII String l	6C	01101100
	103	67	ASCII String a	61	01100001
	104	68	ASCII String y	79	01111001
	105	69	Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASCII code 0Ah,set rem	0A	00001010
	106	6A	Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASCII code 0Ah,set re	20	00100000
107	6B	Manufacturer P/N(If<13 char--> 0Ah, then terminate with ASCII code 0Ah,set rem	20	00100000	

## Product Specification

**APPENDIX A. Enhanced Extended Display Identification Data (EEDID™) 3/3**

	Byte (Dec)	Byte (Hex)	Field Name and Comments	Value (Hex)	Value (Bin)
<i>Timing Descriptor #4</i>	108	6C	Flag	00	00000000
	109	6D	Flag	00	00000000
	110	6E	Flag	00	00000000
	111	6F	Data Type Tag ( ASCII String )	FE	11111110
	112	70	Flag	00	00000000
	113	71	ASCII String L	4C	01001100
	114	72	ASCII String P	50	01010000
	115	73	ASCII String 1	31	00110001
	116	74	ASCII String 5	35	00110101
	117	75	ASCII String 6	36	00110110
	118	76	ASCII String W	57	01010111
	119	77	ASCII String H	48	01001000
	120	78	ASCII String 2	32	00110010
	121	79	ASCII String -	2D	00101101
	122	7A	ASCII String T	54	01010100
123	7B	ASCII String L	4C	01001100	
124	7C	ASCII String H	48	01001000	
125	7D	ASCII String 2	32	00110010	
<i>Checks</i>	126	7E	Extension flag (# of optional 128 panel ID extension block to follow, Typ = 0)	00	00000000
	127	7F	Check Sum (The 1-byte sum of all 128 bytes in this panel ID block shall = 0)	3A	00111010