MConn
Connected Display

CONNECTING A SMARTER WORLD

OUR DISPLAY PROVIDES THE CONNECTION PEOPLE ARE NEEDING TO SUCCEED IN THIS EVER-GROWING, FAST-PACED TECH WORLD.

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MConn

MConn is our new generation of ***Connected Displays*** with a powerful 32-bit multi-core ARM Cortex-A9 processor, with 2D, 3D, and Vector Graphics hardware acceleration. Featuring a multi-touch PCAP touchscreen, operators can take advantage of many gestures found on tablets today, including pinch-to-zoom, rotation, flick, and many more. It can be programmed to run on Embedded Linux, Android, or QNX, depending on the user requirements. The display comes packed with a rich set of wired and wireless interfaces, including CAN (2x), LIN, Ethernet, USB (2x), audio, camera inputs (4x), I/O (22), 4G LTE, GPS, WiFi, and Bluetooth.

A NEW CONNECTED WORLD

The internet is one of the most important and transformative technologies ever invented. It is like a fabric that is woven into the lives of all of us in a multitude of ways. This well-known and well-used internet of people has changed our experience of the world, our access to information, and our interaction with each other. But now there is a new internet emerging that will have an even greater impact. A connection between things has been created, producing an Internet of Things (IoT). And by having the internet of things interact with the internet of people we are able to revolutionize our world even more.

This connectivity revolution has become possible thanks to recent technological advances. These advances have led to the production of the most innovative, intelligent, and cost effective electronics available. The ground breaking changes to the Internet of Things provide the ability to sense the world around them and the ability to communicate with the world around them. Combined with pre-existing features such as memory and controls we now create the new situation where objects can interact, exchange experiences, optimize, and collaborate.
This behavior is not unlike ourselves being able to see, smell, hear, create and share memories and join together for a cause.

Almost everyone would agree that humans are quite complicated and despite our many senses it took us some time to figure out how things work and how to communicate with others.
In a way, we are facing a similar situation in the “Internet of Things”. Evolution of technology has given us very sophisticated machines and equipment, that can’t wait to get connected. Only this time it is up to engineers to find out how to get it done.

The key is to collaborate with advanced partners like MRS Electronic who understand the new machine-to-machine (M2M) world, its language, and its principles. By creating Connected Subsystems for our customers they are instantly enabled to take their highly complex equipment and machines into the IoT world, knowing they have a strong team behind them. One of these new IoT enabling subsystems is the Connected Display described in more detail in this document.

SPECIFICATION

PROCESSOR	
MAIN PROCESSOR	NXP i.MX6, 32-bit Cortex-A9 ARM processor Single, Dual, or Quad core 1.2 GHz (commercial grade) 1 GHz (automotive grade)
COPROCESSOR	Watchdog, analog inputs, and CAN functions. CAN ready in < 0.5s from cold boot
RAM	1 GB DDR3 4 GB DDR3 (optional)
GPU	2D, 3D, Vector Graphics Hardware Acceleration
VIDEO	1080p, 30fps, encoding and decoding
STORAGE	4 GB eMMC for OS and user application. Up to 64 GB available on micro SD card for additional applications or logging
BOOT TIME	< 8 second boot (default), 2 seconds to splash screen CAN ready in < 0.5s on coprocessor < 2 second boot possible, dependent on OS requirements

DISPLAY	
SCREEN SIZE	7” WSVGA is Standard (10.1”,12.3” Extra-Wide, & 15” Extra-Wide available)
RESOLUTION	1024 x 600 pixels (for 7”) 1280 x 800 pixels (for 10.1”) 1920 x 720 pixels (for 12.3 “Extra-Wide)
BRIGHTNESS	1000 NITS
COLOR DEPTH	24 bit
CONTRAST RATIO	560:1 (7” & 10”) 1000:1 (Extra-Wide)
VIEWING ANGLE	θL = 75° for 7”, 80° for 10.1” θR = 75° for 7”, 80° for 10.1” θT = 70°for 7”, 80° for 10.1” θB = 75° for 7”, 80° for 10.1”
BACKLIGHT	User programmable, 0-100%
TOUCHSCREEN	PCAP, 5-point multi-touch (optional)
MULTI-SCREEN CAPABILITY	Dual Screen output available on HDMI receptacle (can be mirrored or independent)

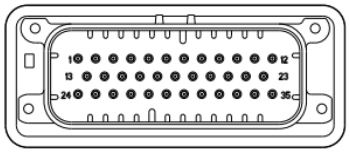
ENCLOSURE	
MATERIAL	Polycarbonate + ABS, with Gore membrane vent
MOUNTING	VESA 50, optional mounting bracket
CONNECTORS	1x TE 1-776231-1 (Power, GND, CAN, LIN, I/O) 1x TE 776261-1, 14-position (4x camera, audio) 1x HDMI Type A (secondary display) 2x SMA connectors (optional, GPS, Radio) 2x USB connector with optional dust cap 1x Gigabit Ethernet connector
IP CLASS	IP54 IP65 (optional)
EMC/EMI	ISO 10605, CISPR 25
IMMUNITY	ISO 7637-2, ISO 16750-2
SHOCK	ISO 16750-3, 20G
VIBRATION	ISO 16750-3, Test VII
TEMPERATURE RANGE (for 7”)	Operating: -30 to 70C Storage: -40 to 85C
SIZE (w/o connectors)	200.6mm x 139.1mm x 35mm (7”) 263.7mm x 237.5mm x 45mm (10.1”)

SENSORS	
ACCELEROMETER	3-axis, ±2/±4/±8/±16 g acceleration range. Selectable full scales
GYROSCOPE	3-axis, ±125/±245/±500/±1000/±2000 dps angular range. Selectable full scales
COMPASS	3-axis, used in conjunction with accelerometer to provide accurate heading information
BUZZER	2.3kHz Tone, PWM Capable
Real Time Clock	Onboard battery to keep track of time while unit is powered off

SOFTWARE	
OPERATING SYSTEM	Linux, Android, QNX
SOFTWARE IDE	Qt5, Crank Software, Altia
SOFTWARE UPDATES	USB, Ethernet, WiFi, Cellular, CAN

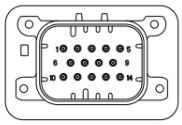
INTERFACES	
CAN	2x CAN, 20 kbps – 1Mbps
LIN	1x LIN, 1 kbps – 20 kbps
ETHERNET	Gigabit Ethernet, 10/100/1000 Base-T
USB	2x USB 2.0 with optional dust cap
CAMERA	4x Analog video inputs NTSC or PAL, Single-Ended or Differential
AUDIO	Stereo out, Mic in
INPUTS	12 digital inputs 6 analog inputs 2 Thermistor inputs 2 frequency counter inputs
OUTPUTS	4 digital high side drivers (2A each)
CELLULAR	3G fallback (UMTS/HSPA) 4G LTE
GPS	NMEA data, dedicated GPS antenna connection
WIFI	802.11 bgn, +20 dBm TX, -97 dBm RX
BLUETOOTH	Bluetooth 4.0, +20 dBm TX, -94 dBm RX
RADIO TUNER	AM/FM/WX Tuner with RDS decoder
POWER SUPPLY	9-32 VDC. CPU operational down to 7 VDC
IGNITION	Ignition input for CPU

I/O INTERFACE



Mating Connector: AMPSEAL 776164-1

Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Digital In	**7**	Digital Out	**13**	VCC_LIN	**19**	Analog In	**25**	Digital In	**31**	Digital In
2	Digital In	**8**	Digital In	**14**	LIN	**20**	Analog In	**26**	CAN1_L	**32**	CAN2_L
3	Digital Out	**9**	Analog In	**15**	GND	**21**	GND	**27**	CAN1_H	**33**	CAN2_H
4	Digital Out	**10**	Analog In	**16**	VCC	**22**	Analog In	**28**	Digital In	**34**	Digital In
5	Digital In	**11**	Digital In	**17**	Analog In	**23**	VCC	**29**	Digital In	**35**	Digital In
6	Digital Out	**12**	Digital In	**18**	GND	**24**	GND	**30**	Ignition		

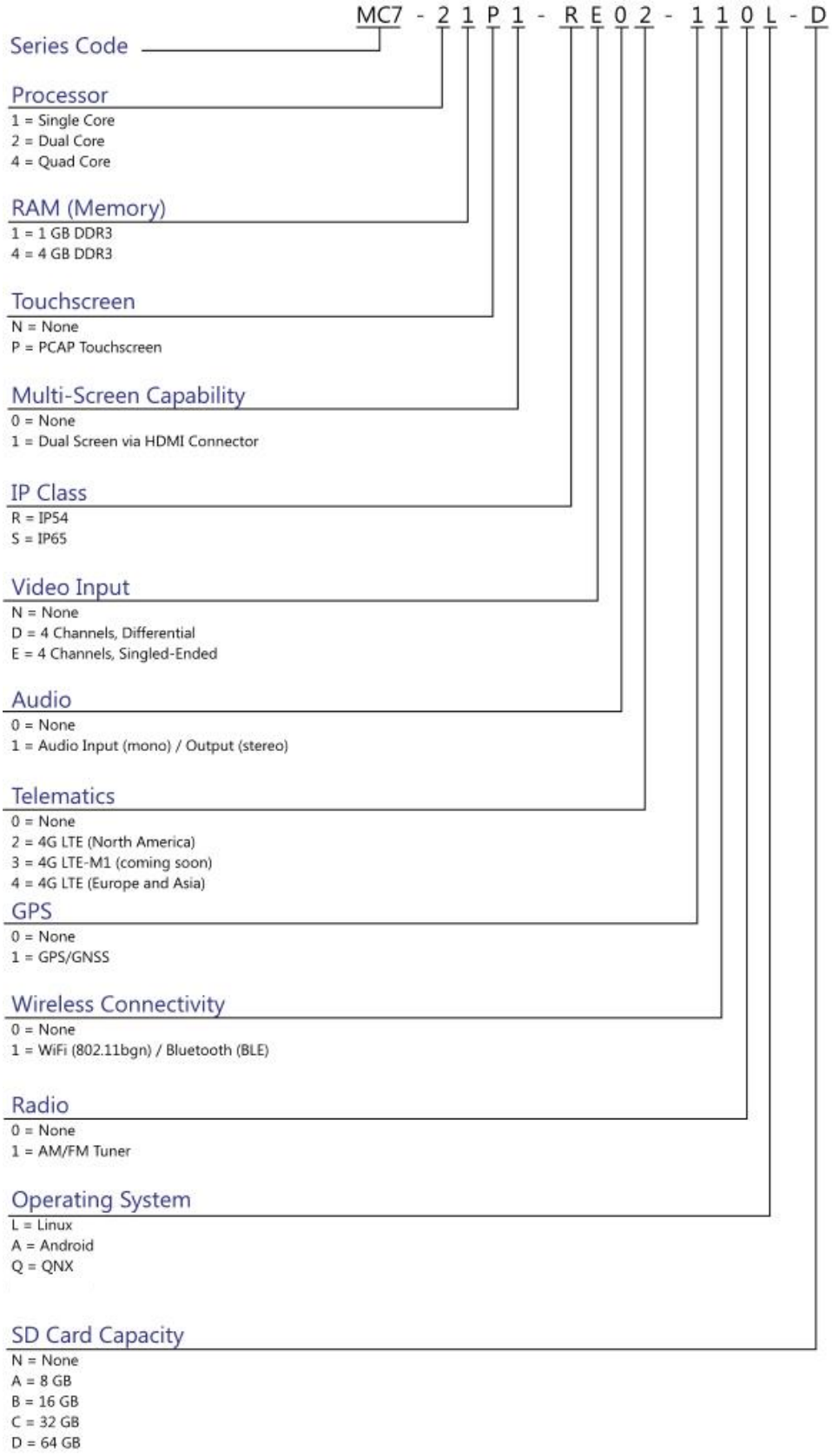


Mating Connector: AMPSEAL 776273-1

Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	Video1+	**4**	Audio L	**7**	Video3-	**10**	Video4+	**13**	Audio Mic
2	Video1-	**5**	Audio R	**8**	Video2+	**11**	Video4-	**14**	GND
3	Video3+	**6**	GND	**9**	GND	**12**	Video2-		

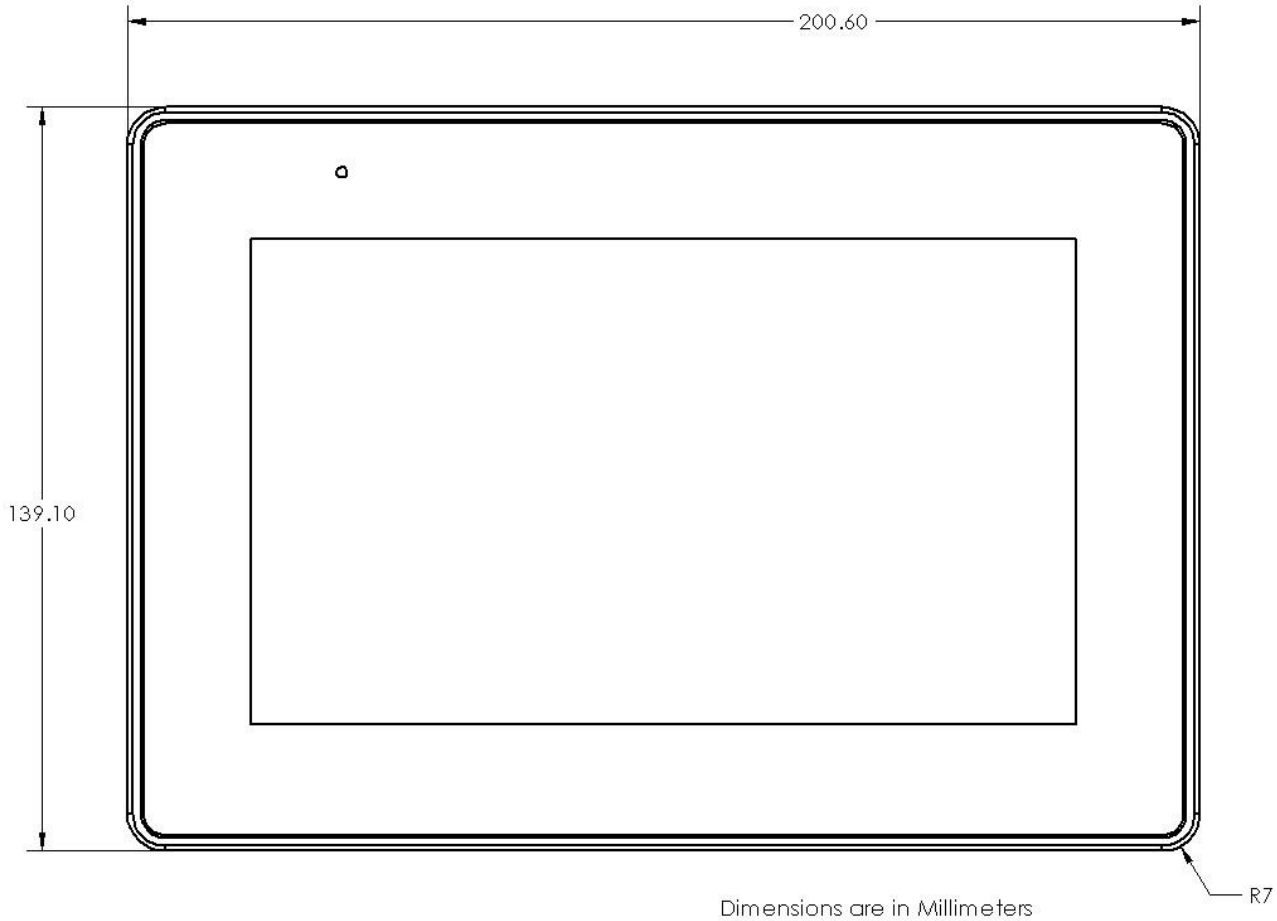
OPTIONS / ACCESSORIES	
POWER INDICATOR	RGB LED on front bezel of display (user programmable)
TERMINATING RESISTOR	CAN1, CAN2
LCD SURFACE TREATMENT	Anti-Glare Anti-Reflection Optically Bonded (standard on larger LCD sizes)
LCD BACKLIGHTING	IPS Backlight (standard on larger LCD sizes), to improve viewing angle to 80° all sides
BEZEL	Custom bezels or connectors available upon request
MOUNTING	Bracket for panel mounting VESA 50 type mount for pedestal mounting

ORDERING INFORMATION



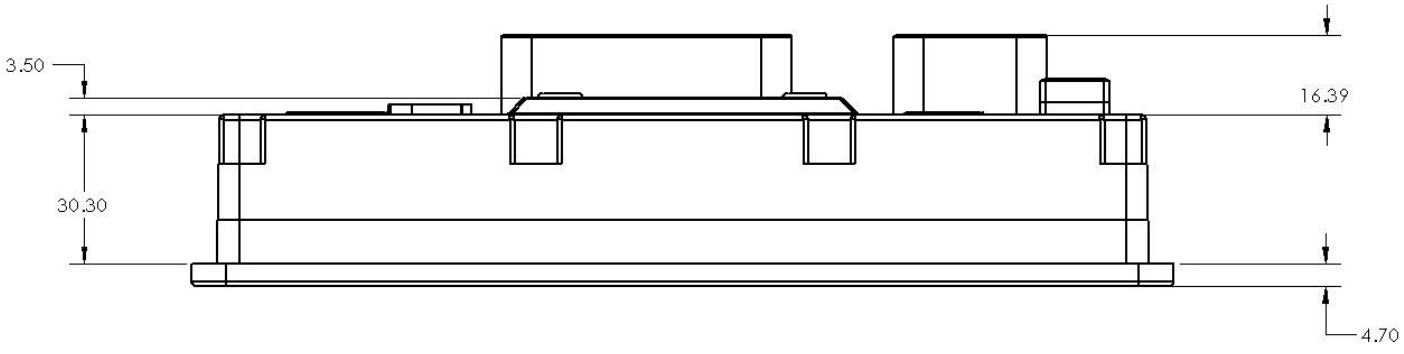
DIMENSIONS (standard 7" version shown)

Front View



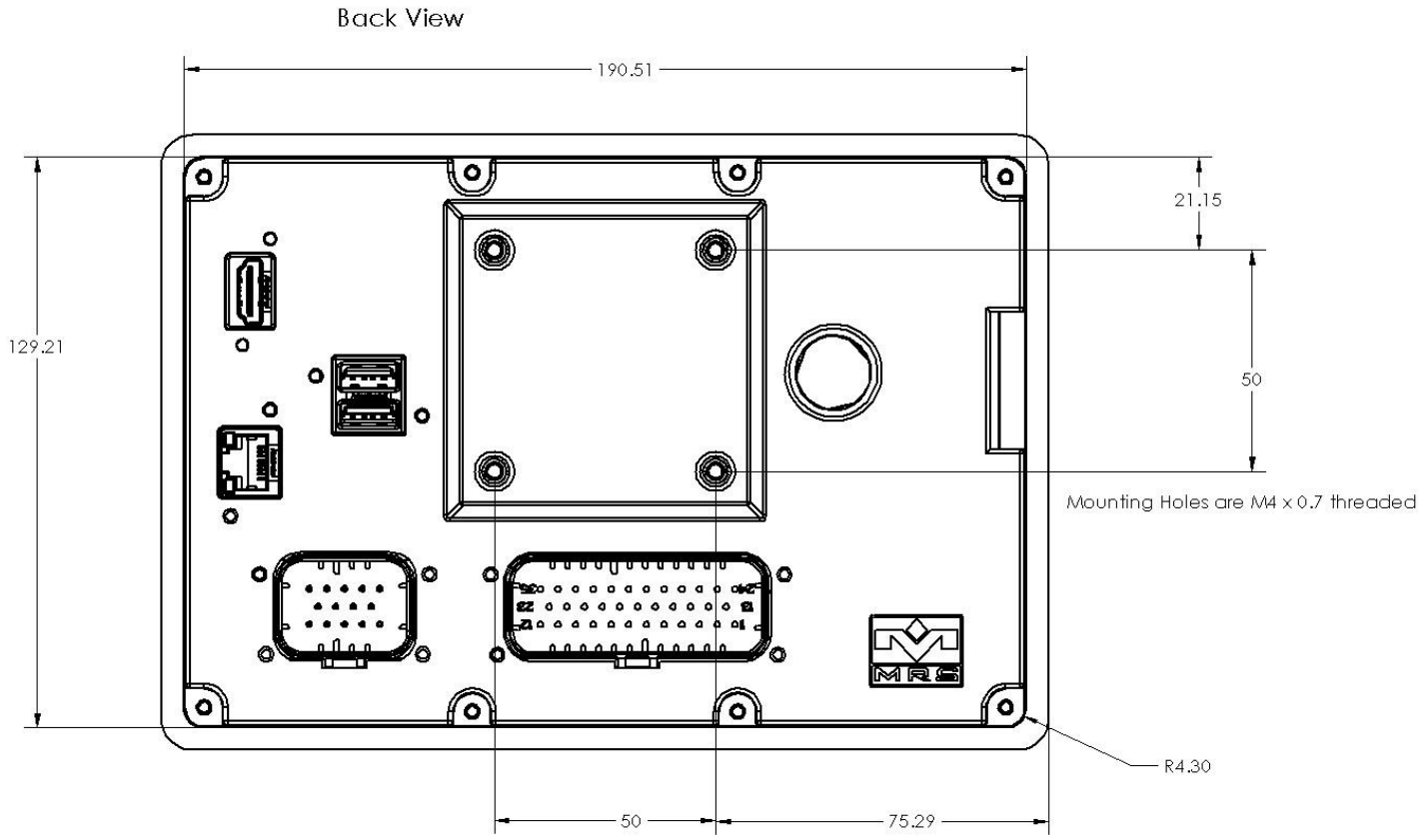
Dimensions are in Millimeters

Top View



Dimensions are in Millimeters

DIMENSIONS


Back View
190.51
129.21
21.15
50
Mounting Holes are M4 x 0.7 threaded
R4.30
50
75.29