MATRIX

Power and Technology Requirements

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Power Requirements - 120 VAC

WARNING: Failure to follow these specifications can cause damage to your product, void the warranty, and/or cause damage to your facility if wiring cannot handle the inrush current and causes a fire.

- All video and power outlets must be functional on the day of delivery/assembly of the product. The client is responsible for any additional installation charges associated with return visits.
- Do not modify the power cord provided with this product. If the plug will not fit your electrical outlet, have a proper outlet installed by a qualified electrician. The electrician will also know if your current breakers will support the product requirements. Matrix is willing and able to speak directly with your preferred electrician if supplied with the information.
- Matrix Treadmills require the following copper wiring gauges based on the distance between the unit and the panel: 100 ft or less = 12-gauge wire; 101–125 ft = 10-gauge wire, 126–150 ft = 8-gauge wire; a run over 150 ft is not recommended.
- GFCI outlets cannot be used to power Matrix Treadmills.

IMPORTANT: Please refer to the Matrix Power Cord Guide for details on what power cord comes with each modality and what cords are available for purchase.

Matrix Treadmills

- Each treadmill requires a dedicated 120 VAC 20A circuit.
  - Treadmills require dedicated ground and dedicated neutral wires (i.e., dedicated circuit). This means that the ground and neutral wires that are fed to the electrical outlet utilized by the treadmill are not shared or otherwise connected to other circuits or appliances.
- Please refer to NEC Article 210-21 and 210-23 for additional information.
- The treadmill receptacle must be a NEMA 5-20R receptacle.
  - Outlets must be compatible with the included power cord; adapters or extension cords cannot be used.
- The power cord on treadmills uses a NEMA 5-20P plug.

Matrix Non-Treadmill Product

Powered

- Up to 4 non-treadmill units can be powered by a single 120 VAC 15A circuit.
  - Outlets must be compatible with the included power cord; adapters or extension cords cannot be used.
- ClimbMills, Virtual Training Cycles, and any frame using Touch or Touch XL consoles require external power.
- Onyx cardio requires external power.
- All non-treadmill cardio equipment uses a 5-15P plug.

Self-Powered

- Cardio bikes, Ascent/Ellipticals, and Stepper frames may be self-powered depending on the console type.
  - Frames with Touch and Touch XL consoles can NOT be self-powered.
  - All Onyx frames can NOT be self-powered.
  - Frames using self-power require a minimum RPM/SPM to power the console. A battery in the frame supplies the power.

Consoles attached to powered frames are configured with the ability to enter an energy saving/low-power mode when the unit has not been in use for a specified period. Additional time may be required to fully

reactivate this unit once it has entered the low-power mode. This energy-saving feature may be enabled or disabled. Contact Matrix Customer Technical Support for more information.

Matrix Group Training Product

Powered

- S-DriveP and RXP require external power.
- Group Training cardio equipment uses a 5-15P plug.
- The equipment requires a 120 VAC 15A circuit. Multiple units may be on the same circuit, up to four units per 15A circuit.

Self-Powered

- CXC, CXM, CXP, S-DriveC, S-DriveM, S-Force, and Rowers (except RXP) may be self-powered.
  - Units using self-power require a minimum RPM/SPM to power the console. A battery in the frame supplies the power. An additional power cord can be purchased to recharge the battery. Contact your local Customer Technical Support for more details.
  - Units with an optional console (ANT+) have 2 AA batteries in the console that can be replaced.

Matrix Strength (ITC Consoles)

Powered

- Up to 4 units can be powered by a single 120 VAC 15A circuit.
  - Outlets must be compatible with the included power cord; adapters or extension cords cannot be used.
- ITC equipment uses a 5-15P plug.

See the Quick Reference – 120 VAC Power Requirements at the end of this document for a recap.

Power Requirements - 220-240 VAC

WARNING: Failure to follow these specifications can cause damage to your product, void the warranty, and/or cause damage to your facility if wiring cannot handle the inrush current and causes a fire.

- All video and power outlets must be functional on the day of delivery/assembly of the product. The client is responsible for any additional installation charges associated with return visits.
- Do not modify the power cord provided with this product. If the plug will not fit your electrical outlet, have a proper outlet installed by a qualified electrician. The electrician will also know if your current breakers will meet the product requirements. Matrix is willing and able to speak directly with your preferred electrician if supplied with the information.
- All units must use electrical outlets with secure ground connections. Do not use adapters or other means to bypass a proper and secure ground connection. If necessary, contact a qualified electrician for assistance.

Matrix Treadmills

- Each treadmill requires a dedicated 220-240 VAC 16A circuit.
  - A dedicated circuit means that means that there is only a single electrical outlet wired to a circuit breaker.
  - Treadmills also require dedicated ground and dedicated neutral wires. This means that the ground and neutral wires that are fed to the electrical outlet utilized by the treadmill are not shared or otherwise connected to other circuits or appliances.

Matrix Non-Treadmill Product

Powered

- Up to 4 non-treadmill units can be powered by a single 220-240 VAC 10A circuit.
  - Outlets must be compatible with the included power cord; adapters or extension cords cannot be used.
- ClimbMills, Virtual Training Cycles, and any frame using a Touch or Touch XL console require external power.
- Onyx cardio requires external power.

Self-Powered

- Cardio bikes, Ascent/Ellipticals, and Stepper frames may be self-powered depending on the console type.
  - Frames with Touch and Touch XL consoles can NOT be self-powered.
  - All Onyx frames can NOT be self-powered.
  - Frames using self-power require a minimum RPM/SPM to power the console. A battery in the frame supplies the power.

Consoles attached to powered frames are configured with the ability to enter an energy saving/low-power mode when the unit has not been in use for a specified period. Additional time may be required to fully reactivate this unit once it has entered the low-power mode. This energy-saving feature may be enabled or disabled. Contact Matrix Customer Technical Support for more information.

Matrix Group Training Product

Powered

- S-DriveP and RXP require external power.
- Up to 4 units can be powered by a single 220-240 VAC 10A circuit.

Self-Powered

- CXC, CXM, CXP, S-DriveC, S-DriveM, S-Force, and Rowers (except RXP) may be self-powered.
  - Units using self-power require a minimum RPM/SPM to power the console. A battery in the frame supplies the power. An additional power cord can be purchased to recharge the battery. Contact your local Customer Technical Support for more details.
  - Units with an optional console (ANT+) have 2 AA batteries in the console that can be replaced.

Matrix Strength (ITC Consoles)

Powered

- Up to 4 units can be powered by a single 220-240 VAC 10A circuit.
  - Outlets must be compatible with the included power cord; adapters or extension cords cannot be used.

See the Quick Reference – 220-240 VAC Power Requirements at the end of this document for a recap.

Internet Requirements

Touchscreen Consoles

Matrix strongly recommends customers using touchscreen consoles have a dedicated network for their fitness equipment due to bandwidth requirements. If bandwidth requirements are not met, interactive apps such as Netflix and other streaming services will not perform as intended. For standard definition, **the download speed requirement is 3mbps per console; however, for high-definition streaming, the download speed requirement is 5mbps per console.**

During setup, touchscreen consoles will search for available networks, and you can choose the connection; however, all consoles should be connected to the same network.

Wireless Connections

- Facilities will need 1 commercial grade access point per 20 consoles. Access points can be configured to allow more than 20 consoles to connect to it if the minimum bandwidth requirements are met. An example of an acceptable access point is:
  - Xirrus XR-630: Dual radio 3x3 MIMO 802.11ac AP with up to 2.6Gbps Wi-Fi bandwidth
- Matrix touchscreen consoles will require communication between each other, as well as the outside network using the following protocols:
  - UDP - Used to broadcast the console configuration to other consoles
  - TCP - Used to intercept the UDP broadcast and perform configuration pull requests
  - HTTP / HTTPS - Used for any external communication via Port 80 and 443

Supported Wireless Security Encryptions

- WPA2 + AES
- WPA + AES
- WPA + TKIP/AES (TKIP is there as a fallback method)
- WPA + TKIP
- WEP
- Open Network (no security at all)

Not Supported

- Any networks that have a landing page or portal configuration, even if it is to accept the terms and conditions.
- Any networks that require user logins to gain access to the network, as these are not exposed on our UI.
- WPA Enterprise.

Wired Connections

- Wired connections require a CAT5e or CAT6 cable with RJ45 fittings.
- NIC (Network Interface Controller) card; the console ethernet port is rated to 10/100Mbps.

LED Consoles (PLED, LED, GTLED)

Matrix LED consoles can be connected to the internet for Asset Management, Community 360, and Engage 360 reporting. The Premium LED console can stay up to date with console software releases by connecting to the internet. Since there are no streaming entertainment features with LED consoles, **the bandwidth requirement is 0.5mbps**.

Matrix strongly recommends that customers using LED consoles create a wireless network in their facilities that matches the default wireless network preconfigured on non-touch screen consoles. (Wi-Fi board configuration shown below.)

PLED consoles come standard with Wi-Fi boards installed in them while LED and GTLED consoles can have a Wi-Fi board purchased and added to the console. The Wi-Fi boards have the configuration file preloaded on it allowing it to automatically connect to SSID “MXWireless” if the network is available in the facility. If this network is not available, the Wi-Fi board configuration file will need to be manually updated to an available network.

Default Wi-Fi board configuration file:
[WIFI AP]
SSID=MXWireless
Security=WPA2-PSK
Encryption=AES
Key=FuWxzbbocf0t
KeyIndex=1
TimeZone=21

Wireless Connections

- All consoles can connect to an access point if it is within 50-ft sq. radius. Examples of acceptable access point are:
  - Xirrus X2: 2x2 AP 802.11ac AP with one 5GHz & one 2.4GHz radio
  - Xirrus XR-620: Dual radio 2x2 MIMO 802.11ac AP with up to 1.7Gbps Wi-Fi bandwidth

Supported Wireless Security Encryptions

- WPA2 + AES
- WPA + AES
- WPA + TKIP/AES (TKIP is there as a fallback method)
- WPA + TKIP
- WEP
- Open Network (no security at all)

Not Supported

- Any networks that have a landing page or portal configuration, even if it is to accept the terms and conditions.
- Any networks that require user logins to gain access to the network, as these are not exposed on our UI.
- WPA Enterprise

Wired Connections

- Wired connections require a CAT5e or CAT6 cable with RJ45 fittings.

Network Firewall Exceptions

If your network has a firewall, the following URL's must be able to pass through for console content to work as intended:

www.surveymonkey.com	maxcdn.bootstrapcdn.com	b-tiles.locationiq.org
facebook.com	www.google-analytics.com	c-tiles.locationiq.org
m.facebook.com	www.googleapis.com	myfitnesspal.jfit.co
m.twitter.com	fonts.gstatic.com	https://instagram.com
m.youtube.com	s.ytimg.com	https://web.wechat.com
instagram.com	i.ytimg.com	a-tiles.locationiq.org
youku.com	youtube.jfit.co	unpkg.com
v.qq.com	https://www.hulu.com	dapi.jfit.co
iqiyi.com	https://www.pressreader.com	fonts.googleapis.com
rscu.jfit.co	console-event-service.jfit.co	
console-event-service-prod.jfit.co	console-event-service-staging.jfit.co	
console-settings-store.jfit.co	dev-console-settings-store.jfit.co	
npr7a00dlb.execute-api.us-west-2.amazonaws.com		
https://s3-us-west-2.amazonaws.com/jhtsoftware		
https://smartcardio.gui.egym.com/work/#/		
https://preview.gui.partner.api.egym.com/work/#/		
https://gui.partner.ed.ts.egym.coffee/work/#/		

If the organization's firewall permits wildcard rules (most up-to-date ones do), they should wildcard whitelist *.jfit.co, *.jhtassets.com, and *.matrixfitness.com. If they cannot do that, these also need to be whitelisted:

mwtn.jfit.co	images.jhtassets.com	config.jhtassets.com
www.jhtassets.com	frontend-config.jfit.co	staging-mwtn.jfit.co
pt-client.jfit.co	staging-pt-client.jfit.co	orion.jfit.co
staging-orion.jfit.co	qa-orion.jfit.co	dev-orion.jfit.co
facilitycalendar.jfit.co	staging-facilitycalendar.jfit.co	location-ip.jfit.co
www-weather-console.jfit.co	staging-weather-console.jfit.co	
www-myfitnesspal-console.jfit.co		

If the facility will be using Asset Management, the following URL's must not be blocked:

am4.matrixfitness.com	am4-api.jfit.co	

TV Cabling and Signal Requirements

All cabling necessary to run from the wall and/or floor outlet to the Matrix product must be provided by the facility. The cabling must be installed prior to installation of the equipment. If cabling is not installed prior to installation, a Matrix-Certified technician can come after installation to connect the cabling from the wall/floor outlet and perform channel scans for a fee. All cabling internal to the Matrix equipment will be supplied by Matrix.

Embedded Matrix TV (coaxial distributed signal)

- Unencrypted (standard console) and encrypted (Pro: Idiom console) TV signals are supported.
- Tuner supports ATSC, NTSC, and QAM signals.
- Coaxial cable must be, at minimum, dual-shielded RG6 cable with F-Type compression fittings.
- Splitters or taps are acceptable for signal distribution. Signal distribution must be balanced through the cable run and meet the requisite levels at the base of equipment.
- Pre-2020 consoles: If Cable TV provider supplies set top boxes, you will need a Cable SAT or CAB device for channel changing. For 2020 and newer consoles, a facility prep document should be filled out. Contact your sales rep for more details.

North America Tuner Specifications					
Aver Media H837O Tuner (75Ω)			**Swift Tuner** (75Ω)		
Signal Type	**Min**	**Max**	**Signal Type**	**Min**	**Max**
Digital			Digital		
ATSC (8VSB)	-15dBmV	+15dBmV	ATSC (8VSB)	-15dBmv	+15dBmV
QAM 256	-12dBmV	15dBmV	QAM 256	-15dBmV	+15dBmV
QAM 64	-15dBmV	15dBmV	QAM 64	-15dBmV	+15dBmV
Analog			Analog		
NTSC	0dBmV	30dBmV	NTSC	-3dBmV	+17dBmV

MYE Attached TVs - North America only (coaxial distributed signal)

- Coaxial cable must be, at minimum, dual-shielded RG6 cable with F-Type compression fittings.
- Tuner supports ATSC, NTSC, and QAM signals.
- Pro: Idiom encrypted signal can be supported; however, Pro: Idiom enabled Attached TV's must be ordered.
- If Cable TV provider supplies set top boxes, you will need a Cable SAT or CAB device for channel changing.
- See the chart below for the signal strength measurement where the signal enters the equipment.

MYE Tuner (75Ω)		
Signal Type	**Min**	**Max**
Digital		
ATSC (8VSB)	-1.2dBmV	+8.8dBmV
QAM 256	-1.2dBmV	+8.8dBmV
QAM 64	-1.2dBmV	+8.8dBmV
Analog		
NTSC-M	-2dBmV	+2dBmV

Other TV Sources

The following sources can be supported. See your local Matrix sales representative for more information.

- Unencrypted IPTV
- Encrypted IPTV (Pro: Idiom)

Quick Reference – 120 VAC

Power Requirements

Cardio Equipment		100-120 VAC / 50-60Hz			
Model	**Series**	**Circuit Breaker Minimum**	**Number of Units per Circuit**	**External Power Required**	**Self-Power Capability**
Treadmill	Lifestyle	20A	1	Yes	No
	Endurance				
	Performance				
	Performance Plus				
	Onyx				
ClimbMill	Lifestyle	15A	4	Yes	No
	Endurance				
	Performance				
	Onyx				
Ascent	Performance			When paired with Touch/Touch XL Console	When paired with LED consoles
	Onyx			Yes	No
Elliptical	Lifestyle			When paired with Touch/Touch XL Console	When paired with LED consoles
	Endurance				
	Performance				
Stepper	Endurance				
Recumbent Bike	Lifestyle				
	Endurance				
	Performance				
	Onyx			Yes	No
Upright Bike	Lifestyle			When paired with Touch/Touch XL Console	When paired with LED consoles
	Endurance				
	Performance				
	Onyx			Yes	No
Hybrid Bike	Performance			When paired with Touch/Touch XL Console	When paired with LED consoles
Virtual Training Cycle	-			Yes	No

Group Training & Strength Equipment		100-120 VAC / 50-60Hz			
Type	**Model**	**Circuit Breaker Minimum**	**Number of Units per Circuit**	**External Power Required**	**Self-Power**
Training Cycles	CXM & CXC	-	-	No	Yes
	CXP				
Rowers	Rower				
	RXP	15A	4	Yes	No
S-Drive	S-DriveC & S-DriveM	-	-	No	Yes
	S-DriveP	15A	4	Yes	No
Strength	ITC				

Power Dissipation (120 VAC)

Model	Series	Energy Saver Dissipation, Watts	Standby Dissipation, Watts	Maximum Expected Power Dissipation Watts
Treadmill	Lifestyle	.45W	28W	2040W
	Endurance			
	Performance			
	Performance Plus	.44W	73W	
Elliptical	Lifestyle	.33W	27W	166W
	Endurance			
	Performance			
Ascent Trainer	Performance	.43W	29W	408W
ClimbMill	Lifestyle	.43W	37W	264W
	Endurance	.37W	39W	290W
	Performance			
Stepper	Endurance	.33W	27W	166W
Upright Cycle	Lifestyle	.43W	25W	160W
	Endurance			
	Performance			
Recumbent Cycle	Lifestyle			
	Endurance			
	Performance			
Hybrid Cycle	Performance			

Quick Reference – 220-240 VAC

Power Requirements

Cardio Equipment		220-240 VAC / 50-60Hz			
Model	**Series**	**Circuit Breaker Minimum**	**Number of Units per Circuit**	**External Power Required**	**Self-Power Capability**
Treadmill	Lifestyle	16A	1	Yes	No
	Endurance				
	Performance				
	Performance Plus				
	Onyx				
ClimbMill	Lifestyle	10A	4	Yes	No
	Endurance				
	Performance				
	Onyx				
Ascent	Performance			When paired with Touch/Touch XL Console	When paired with LED consoles
	Onyx			Yes	No
Elliptical	Lifestyle			When paired with Touch/Touch XL Console	When paired with LED consoles
	Endurance				
	Performance				
Stepper	Endurance				
Recumbent Bike	Lifestyle				
	Endurance				
	Performance				
	Onyx			Yes	No
Upright Bike	Lifestyle			When paired with Touch/Touch XL Console	When paired with LED consoles
	Endurance				
	Performance				
	Onyx			Yes	No
Hybrid Bike	Performance			When paired with Touch/Touch XL Console	When paired with LED consoles
Virtual Training Cycle	-			Yes	No

Group Training & Strength Equipment		220-240 VAC / 50-60Hz			
Type	**Model**	**Circuit Breaker Minimum**	**Number of Units per Circuit**	**External Power Required**	**Self-Power**
Training Cycles	CXM & CXC	-	-	No	Yes
	CXP				
Rowers	Rower				
	RXP	10A	4	Yes	No
S-Drive	S-DriveC & S-DriveM	-	-	No	Yes
	S-DriveP	10A	4	Yes	No
Strength	ITC				

Power Dissipation (220-240V VAC)

Model	Series	Energy Saver Dissipation, Watts	Standby Dissipation, Watts	Maximum Expected Power Dissipation Watts
Treadmill	Lifestyle	.45W	35W	2280W
	Endurance			
	Performance			
	Performance Plus	.44W	62W	3330W
Elliptical	Lifestyle	.33W	27W	166W
	Endurance			
	Performance			
Ascent Trainer	Performance	.43W	29W	408W
ClimbMill	Lifestyle	.43W	37W	264W
	Endurance	.37W	39W	290W
	Performance			
Stepper	Endurance	.33W	27W	166W
Upright Cycle	Lifestyle	.43W	25W	160W
	Endurance			
	Performance			
Recumbent Cycle	Lifestyle			
	Endurance			
	Performance			
Hybrid Cycle	Performance			