



Netpulse Gateway Installation

GETTING CONNECTED GUIDE: Follow the steps outlined in this guide to connect your club

Contents

INTRODUCTION	1
Network Overview	1
Wiring and Infrastructure Summary	1
Equipment Supplied by the Fitness Facility.....	2
Equipment Supplied by Netpulse	2
Map of Data Equipment Configuration	3
STEP 1: VERIFY YOUR INTERNET CONNECTION	4
Streaming Requirements.....	4
STEP 2: CONNECT YOUR CLUB	5
Wired or Wireless Options	5
STEP 3: INSTALL YOUR GATEWAY	10
Install the Networking Rack	10
Cabled Gateway	12
STEP 4: INSTALL YOUR NETPULSE COMPATIBLE EQUIPMENT.....	13
NETPULSE TROUBLESHOOTING GUIDE.....	14
APPENDIX A. GATEWAY TECHNICAL SPECIFICATION	16
APPENDIX B. TECHNICAL SPECIFICATIONS	17
APPENDIX C. TV SIGNAL SPECIFICATIONS.....	18
APPENDIX D. NETWORK SWITCHES	20

Introduction

The Netpulse Media Network installed in health and fitness clubs provides a rich, interactive entertainment experience for club members working out on cardiovascular fitness equipment. The Netpulse equipment is dependent on continuous electrical power and internet connectivity supplied by the club to function properly. This document sets forth Requirements and Best Practices that will ensure the highest availability and reliability of the Netpulse experience for club members and staff.

Network Overview

The Netpulse Media Network is comprised of three major elements that correspond to where components are installed and operate continuously:

1. Netpulse compatible screens: These are the interactive touch screen displays ***mounted on or inside the cardio equipment*** used by club members. They deliver interactive, on-demand content (music videos, TV shows, movie trailers, etc.), iPod integration, cable TV, and workout data.
2. Netpulse Gateway: This device connects the Netpulse compatible screens to the internet (for user login, workout data and playlist data transfer) and streams locally stored content on demand to the screens. It is generally located near the club's internet router in a ***secured server room or electrical closet***.
3. Club Network Infrastructure: This includes the physical plant of Ethernet cabling, wireless access points (if wireless option is selected), switches, electrical power, TV/coax cabling, and associated pathways and enclosures to ensure network connectivity and power to all Netpulse-related hardware. This is present ***throughout the club***.

The facility has to be wired correctly in order to connect and configure Netpulse-compatible machines so that they can deliver On Demand TV and Music Videos, regular TV, and iPod/iPhone compatibility to members, and to collect workout statistics. This document will show you how to best wire your facility. The wiring can be accomplished by facility staff or the facility can hire a subcontractor to do the wiring.

Wiring and Infrastructure Summary

Wiring the fitness facility for Netpulse connectivity will include providing part or all of the following based on the current infrastructure in place in the facility:

- Secure location for Netpulse Gateway and related network equipment
- Network cabling. Netpulse recommends **Cat-6** cabling.

Note: You can use Cat-5e cabling. Netpulse recommends Cat-6 because streaming media applications such as video and multi-media of 1Gb data push the boundaries of Cat5e and benefit from the higher bandwidth offered by Cat-6. Media analysts predict 80-90% of new installations will use Cat-6.

- Internet connectivity via a coaxial cable modem, DSL modem, etc.
- Coaxial cable for TV
- AC power

When completed, if the club does not choose wireless, then each Netpulse-compatible machine will be cabled to the server room or electrical closet, coaxial cabling from each unit will be cabled to the TV source, and there will be a power outlet for each Screen unit.

WIRED INSTALLS – Equipment Supplied by the Fitness Facility

- We suggest a 19” networking rack. The rack will contain a switch, a patch panel, and the Netpulse Gateway.
- You should have an unmanaged switch with the number of ports to accommodate the number of screens, plus at least 3 extra ports. A list of recommended switches is included in Appendix D.
- You should install a patch panel.
- You need patch cables to connect the switch to the patch panel. We suggest 3-ft long cables, one per port.
- You need patch cables for the Netpulse Media Gateway.
- Raceways for cable management. Note: you may have a system installed already.
- Face plates and connectors for electrical, coaxial, Ethernet outlets.

WIRED INSTALLS – Equipment Supplied by Netpulse

For wired installs, Netpulse supplies the Netpulse Media Gateway. The Gateway kit includes the following components. Please ensure these components are in the kit before installing the Gateway.

What’s in the kit:

- The Gateway itself
- The power brick and power cord
- A stand for the Gateway
- 2 Ethernet cables
- Gateway install & troubleshooting document

WIRELESS INSTALLS – Equipment Sourcing

See Step 2 of this Guide regarding Wireless compatibility and sourcing.

Map of Data Equipment Configuration

The following map describes the wiring configuration of a sample facility. It also identifies the contractor or staff responsibilities for wiring the facility.

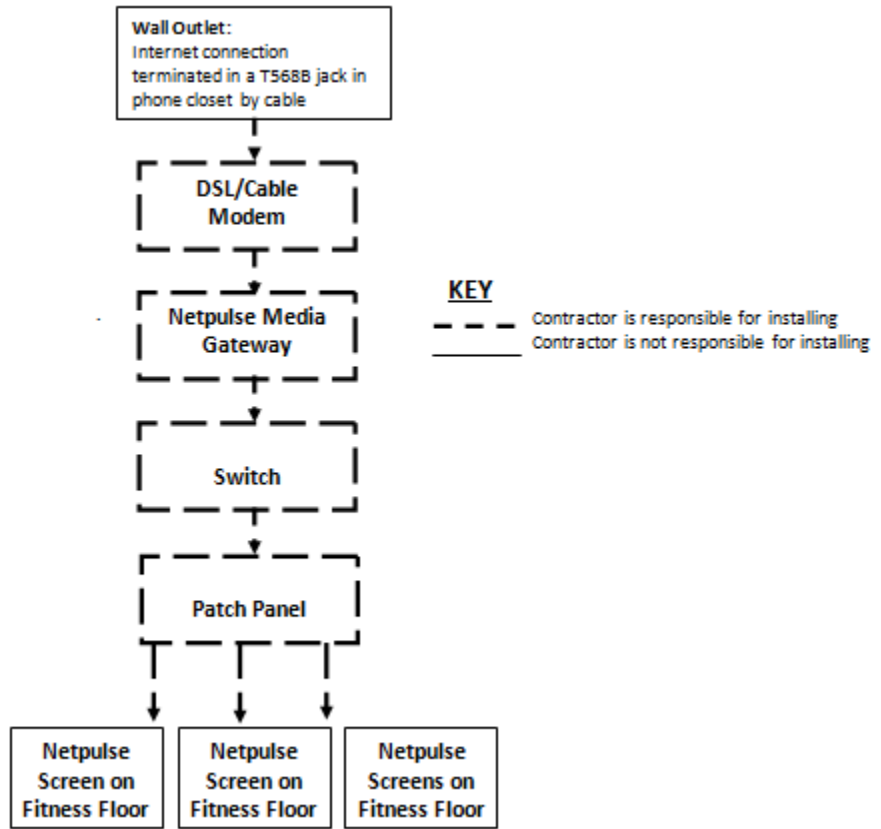


Figure 1. Map of Data Equipment Configuration

Step 1: Verify your Internet Connection

Streaming Requirements

Certain On Demand content available on the Netpulse Network requires to be streamed from the Internet. To enable streaming, each Netpulse-enabled screen should have a **dedicated 250 Kbps of bandwidth**.

Use the following formula (or refer to the table below) to determine the amount of bandwidth your facility will need:

Divide the number of Netpulse-enabled machines by 4 to get the required amount of bandwidth in Mbps. **For example, if your facility has 20 machines, they would need 5 Mb of bandwidth to enable streaming to all twenty machines.**

# of Netpulse Compatible Screens	Bandwidth Needed
1	250 kbps
2	500 kbps
3	750 kbps
4	1 Mb
5	1.25 Mb
6	1.5 Mb
7	1.75 Mb
8	2 Mb
9	2.25 Mb
10	2.5 Mb
11	2.75 Mb
12	3 Mb
13	3.25 Mb
14	3.5 Mb
15	3.75 Mb
16	4 Mb
17	4.25 Mb
18	4.5 Mb
19	4.75 Mb
20	5 Mb

Step 2: Connect your Club

Netpulse-compatible equipment requires 1) power and 2) Internet connectivity, either wireless or wired. TV connectivity is optional.

1. CONNECT POWER.

Ensure that every cardio fitness machine has power available to it.

TIP: Some cardio equipment models have an internal power source that could be used to provide power to the screen – such that the cardio machine and the screen can share the power source. Check with your cardio equipment manufacturer about this.

The **power lines** themselves are not required to be dedicated unless cardio equipment manufacturers specify as such in their equipment manuals.

2. CHOOSE EITHER WIRELESS OR WIRED.

Check this chart to determine whether wireless is an option for your brands of cardio fitness equipment:

Netpulse-Compatible Machine	Wireless Available?	
	Available Now	Not Available At This Time
Life Fitness Add-on Screen	✓	
Matrix Add-on Screen	✓	
Technogym Embedded Touchscreen	✓	
N5i Add-on Screen – installed on any cardio	✓	
Woodway Embedded Touchscreen	✓	
Octane Embedded Touchscreen		✓
Star Trac Embedded Touchscreen		✓

WIRELESS. Wireless service – from an industrial grade technology provider – is sold and installed by Accucode to Netpulse facilities. Accucode’s technicians will survey your facility to assess the exact needs for access points and will provide a custom quote. Simply go to www.getnetpulse.com/wireless to request a survey and quote.

WIRED. If you choose hard wiring, Cat-6 is recommended, and Cat-5e is an acceptable alternative.

If you choose Wired, and elect for your own electrician or staff to handle the work, the specification provides two options:

- A. Distribution Hubs on Fitness Floor.** Run one home-run Cat-6 or Cat-5e from the patch panel to a distribution hub (an 8-port switch is typically used, to serve each group of up to 7 cardio fitness machines to be installed with Netpulse). From the distribution hub, run Cat-6 or Cat-5e to the location of each cardio fitness machine. Terminate with Cat-6 or Cat-5e coupler.
- B. Home Runs.** Some facilities choose to run one Cat-5e or Cat-6 cable directly from the patch panel to each cardio fitness machine location (and terminate with Cat-6 or Cat-5e coupler).

Traditionally, fitness clubs have considered there to be a trade-off between installation cost and network reliability for the system:

- **Home runs to every cardio machine may be more costly than using distribution hubs** due to the additional cabling length required, depending on the number of machines and the size/layout of the fitness facility
- **Distribution hubs present additional opportunity for network disconnection,** should the hubs become unplugged or damaged for any reason.

The specific trade-off for your facility should be assessed based on your layout and environment.

IMPORTANT: Commercial-grade cable management systems must be used to protect all cabling and distribution hubs from foot traffic, tampering and accidental disconnects.

Examples include the Wiremold line by Legrand (such as the Wiremold 3000 or Wiremold 4000) or Panduit cable management. Whether home runs or distribution hubs are installed, a cable management system should be in place so that no cabling or hubs are exposed. Your electrician or cabling technician will be able to source a cable management system for you.

Cabling configurations are displayed in the **Figures below**.

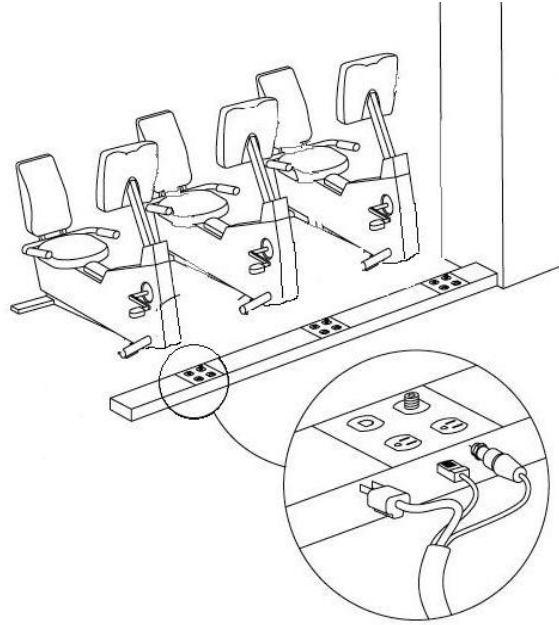


Figure 2. Near Column with Raceway Strip.

If using Distribution Hubs, choose a Raceway system that can accommodate the hubs and keep them fully secured.

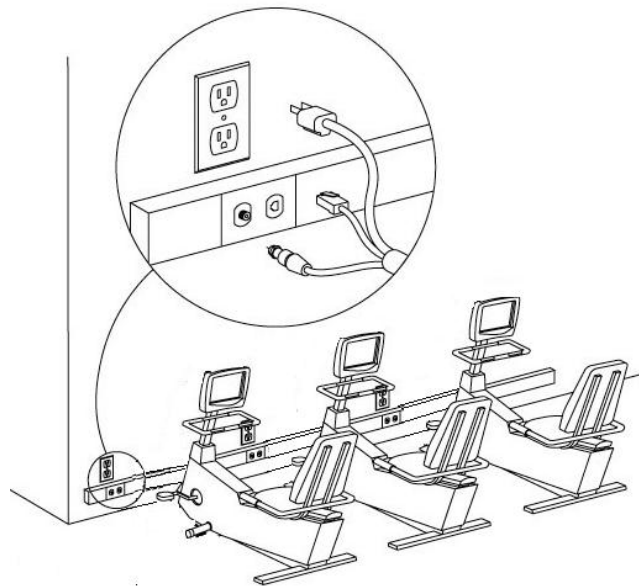


Figure 3. LCR Against a Mirrored Wall

If using Distribution Hubs, choose a Raceway system for the wall that can accommodate the hubs and keep them fully secured.

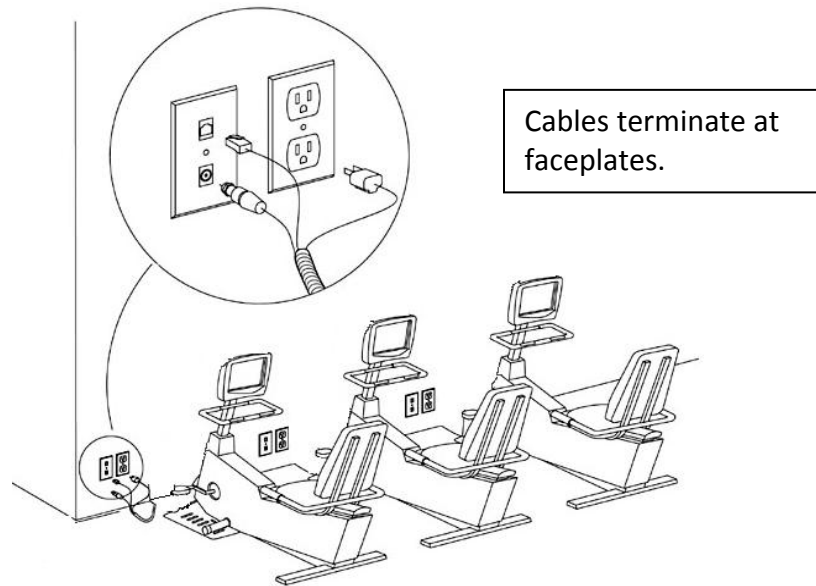


Figure 4. LCR with Faceplates

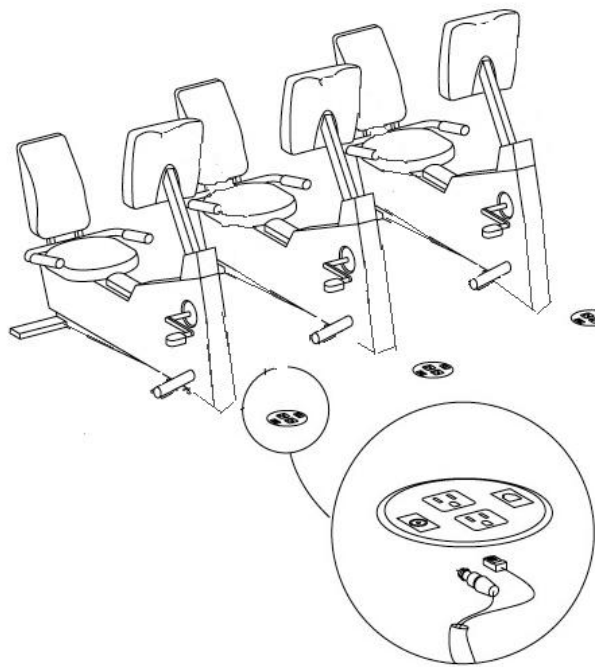


Figure 5. LCR with Floor Mounted Hubbel Jack

CONNECTING THE TV SIGNAL

Run coaxial cable from the fitness room entry to each cardio fitness machine's location. Terminate with coaxial coupler. (Note: Coaxial cable may already be installed at your facility.)

- Note that the RF signal loses strength as it passes down the cable and through combiners and splitters. To counter this loss (or "attenuation") your AV installer will may install an RF amplifier. In the ideal RF distribution system, the signal level at each wall-plate should be about the same as the signal level coming in from the cable TV system.
- Signal strength levels are measured in decibels (dB). Cable companies typically deliver around 20 dB for commercial installs, but you will see a range of 0 to well over 25 dB. If the AV closet is properly cabled, an appropriate amplifier used (if one is used at all), and appropriate splitters, combiners, and terminations are used, the result should be a clear signal to each coaxial drop to the cardio floor. Bad TV picture is often due to signal loss due to a pinched or bent coaxial cable along the run, inappropriate connections or incorrect amplification.

TIP: The higher the amplifier's dB rating, the greater the strength of the signal. Are you thinking: "I'll just get the biggest high-output amplifier available and that will solve all my problems"?

Unfortunately this can also cause a bad picture due to overload. To correctly deliver the "sweet-spot" of 3dB to 9dB to each Netpulse-compatible machine, try a simple 2-Port directional coupler or tap. If your facility has a good signal from the cable company, and your facility has less than 20 units, an amplifier may not even be needed.

Step 3: Install your Gateway

Install the Networking Rack

Preparing and properly labeling the networking rack for Netpulse connectivity will avoid many potential problems. The steps below should allow you ease in setting up the system.

1. Install networking rack on the wall in the phone closet. It should be near power and near the Internet connection. If you can't install a networking rack, place all equipment in a secure location in phone closet.

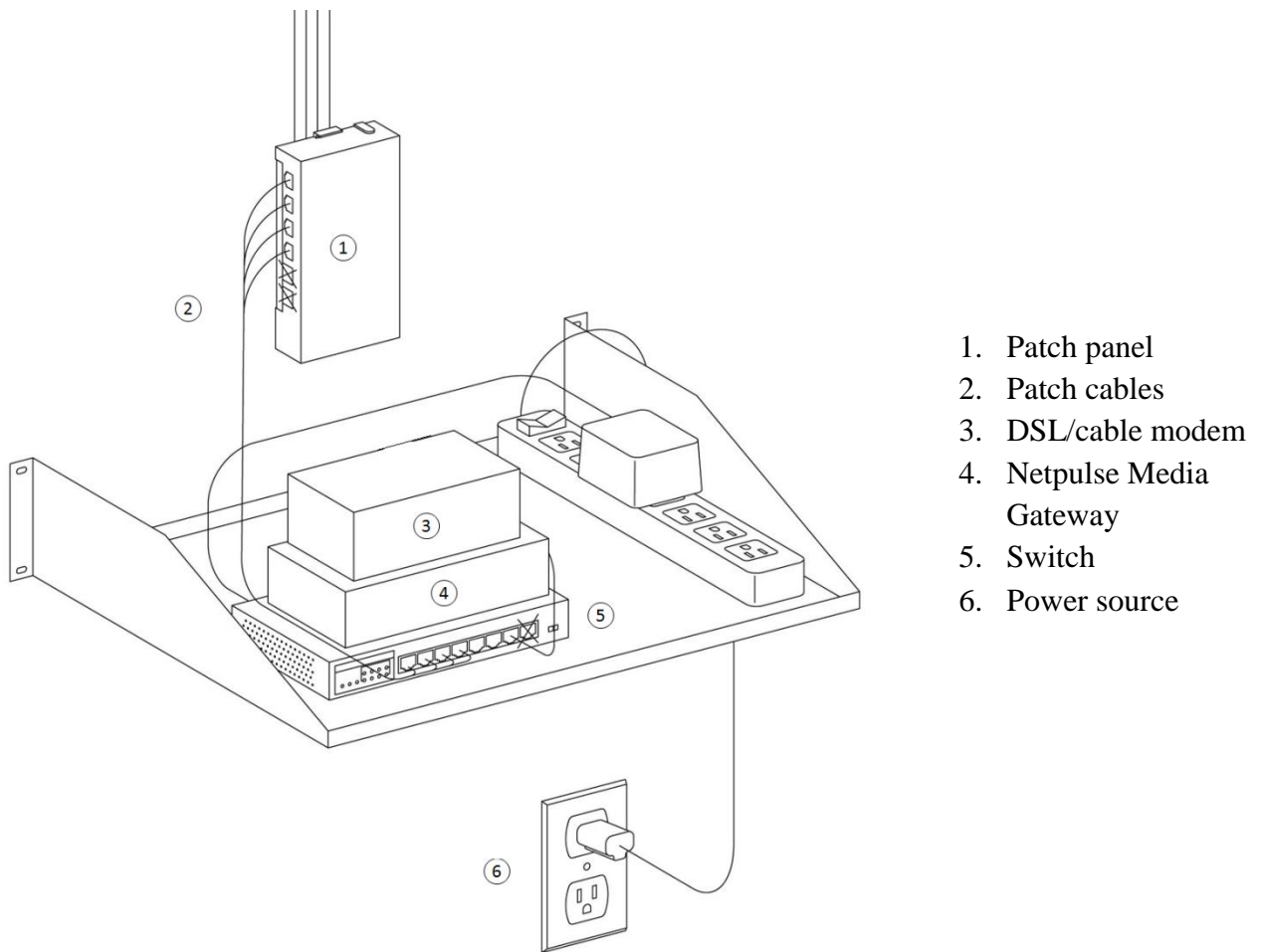
Note: The facility must have a power source **within 3 feet** of the data equipment location. The data equipment requires **1.0 amps @ 120 volt AC**. A dedicated circuit is preferred but not required. Do **NOT** connect to a "switched outlet" connected to a light switch.



Figure 2. Example of Networking Rack

2. Install the Netpulse Media Gateway, a networking switch, a patch panel and DSL/cable modem, and a power strip on the rack.
 - A. Connect cabling from each Netpulse unit on the fitness floor to the patch panel. (recommended).
 - B. **Label** all the jacks on the wall panel. Label the corresponding jacks on the fitness floor as well.

- C. Plug one end of 3-ft gray **patch cables** into **patch panel** and the **other end into switch**.
- D. Plug 3-ft patch cable into one of the ports on the switch and plug other end of cable into the Netpulse Media Gateway.
- E. Connect the **DSL/Cable modem** to the **Gateway**.
- F. Plug in **DSL/Cable modem, switch, and Gateway** and switch into **power source**. See **Figure 6. Rack Components** below for an example of how the components are distributed on a rack.



- 1. Patch panel
- 2. Patch cables
- 3. DSL/cable modem
- 4. Netpulse Media Gateway
- 5. Switch
- 6. Power source

Figure 6. Rack Components

Cabled Gateway

Netpulse Club Gateway Installation

1. Make all cable connections
2. Plug in and power on the Netpulse Gateway

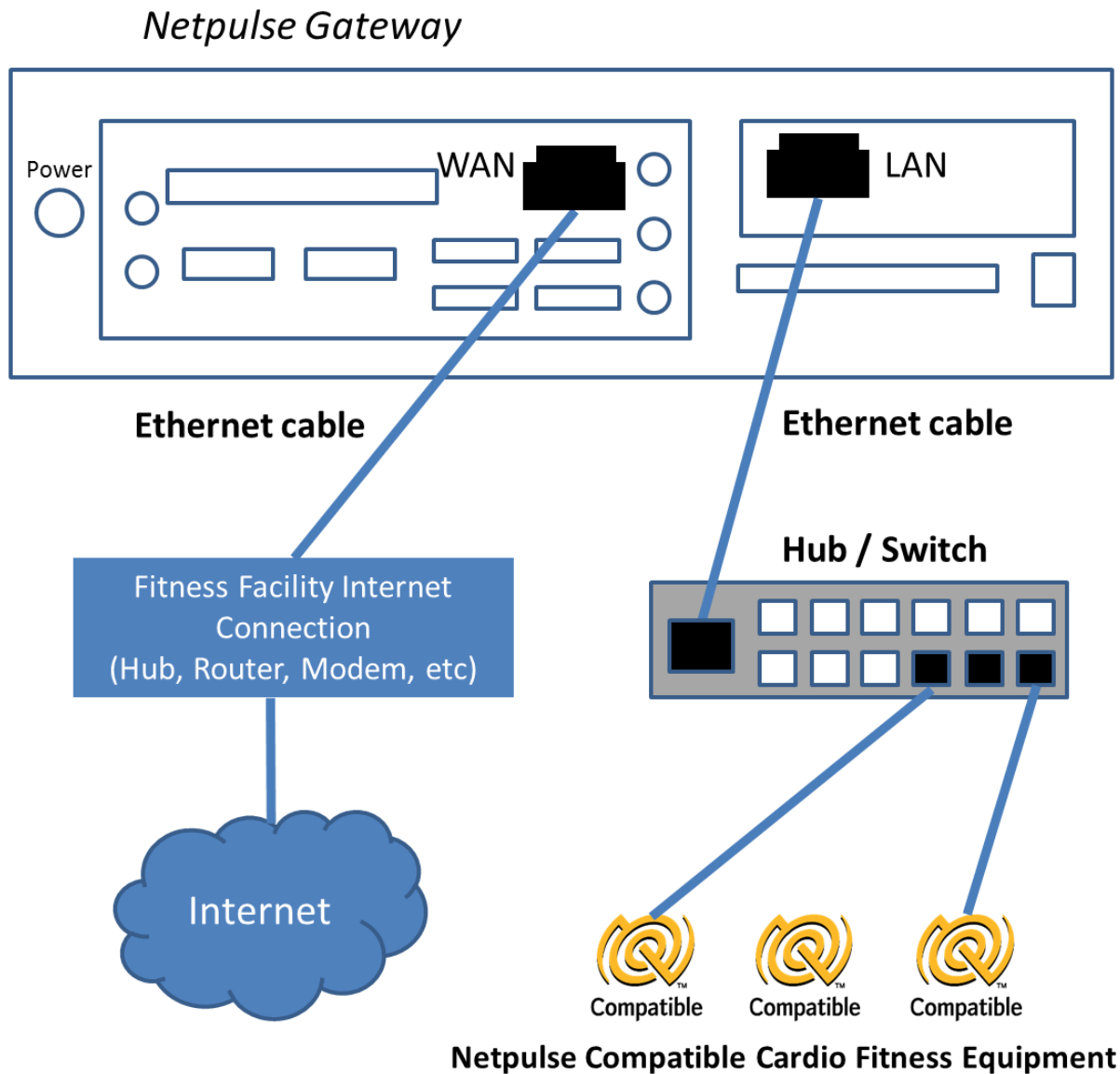
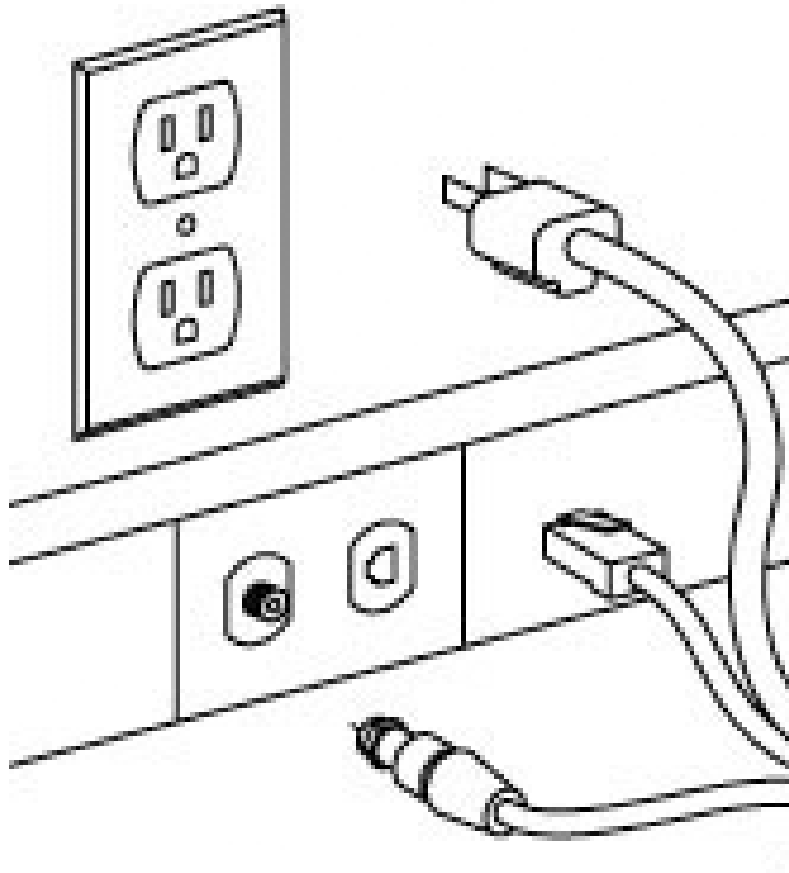


Figure 7. Installed Gateway

Step 4: Install your Netpulse Compatible Equipment

Once your equipment arrives, connect it to power, internet and coax and enjoy your workouts powered by Netpulse!



Netpulse Troubleshooting Guide

If you have a problem with a Netpulse-compatible machine, follow the directions in this troubleshooting guide to solve the problem. If you can't resolve the problem, call Netpulse at: 877-NETPULSE (638-7857) x2.

General Problems

Symptom	Cause	Resolution
All units off	Electricity is shut off	Check and restore power to all machines.
All units. Users cannot sign in	Gateway or Internet service is not connected.	<ol style="list-style-type: none"> 1. Check power and Cat-6 connections on Netpulse Gateway in server room or electrical closet. Restore as needed. 2. Check power and connections to Internet Router; reset Router (remove power for 15 seconds, then restore) if no activity. 3. Check Netpulse-compatible machines again. 4. If problem persists, contact Netpulse.
One Unit. No Power to screen	Machine unplugged or failed power cable	<ol style="list-style-type: none"> 1. Reconnect power at outlet or Netpulse-compatible machine. 2. Contact manufacturer
One unit will not boot up	Unit may be broken.	Contact manufacturer
One unit. Can't sign on. (Note: Check other units for problem.)	Machine has lost connection to Gateway.	<ol style="list-style-type: none"> 1. Check all Cat-6 connections between machine and Gateway. 2. Reboot unit. 3. Test unit to ensure it is working. 4. Contact Netpulse or manufacturer.
One unit. Black screen	Loose power connection	<ol style="list-style-type: none"> 1. Check power connections. 2. Shut down unit and restart unit. 3. Test unit to ensure it is working. 4. Contact manufacturer.

Top Shows, On Demand, and Music Video

Symptom	Cause	Resolution
All units. On Demand/Music Videos do not play.	Problem with Gateway, network switch, or Cat-6 cabling at switch or patch panel	<ol style="list-style-type: none"> 1. Check power on Netpulse Gateway and network switch in server room or electrical closet. Restore as needed. 2. Ensure the Cat-6 cable is securely connected to the Gateway, network switch, patch panels, and all distribution (Hubs/Switches) units. 3. Ensure that Cat-6 is securely connected to each unit. If the internet cable is secure, you should see a link light on the unit where the cable attaches.
All units. Top Shows do not play, but all other On Demand and Music Videos play	Internet connection is down, or Top TV show may have been removed or expired.	<ol style="list-style-type: none"> 1. If all Top Shows affected: Check power and connections to Internet Router; reset Router (remove power for 15 seconds, then restore) if no activity. 2. If not all Top Shows affected: Please contact Netpulse with title of Top Show video.
One unit has no	Machine has lost	<ol style="list-style-type: none"> 1. Check all Cat-6 connections between machine and Gateway.

Symptom	Cause	Resolution
On Demand TV Shows or Music Videos.	connection to Gateway.	<ol style="list-style-type: none"> 2. Ensure Cat-6 is securely connected at machine; refer to product manual to identify the Cat-6 if you're not sure where it is. 3. Reboot unit. 4. Retest video on demand or music video. If you haven't resolved the problem, contact Netpulse.

TV

Symptom	Cause	Resolution
All units. No TV	TV system is down, or coax cabling disconnected in closet	<ol style="list-style-type: none"> 1. Check electrical connections at TV head end system. 2. Check coaxial cable in server room or electrical closet. 3. Contact the TV vendor.
All units have fuzzy picture	Loose or damaged coax cabling at closet or TV signal strength problem	<ol style="list-style-type: none"> 1. Check coaxial cable and connections in server room or electrical closet and main segment feeding all machines. 2. Contact the TV vendor.
One unit. TV not working	Loose coax cable connection or poor signal strength	<ol style="list-style-type: none"> 1. Ensure coax cable and connections are secure. 2. Shut down and restart machine. 3. Test unit to ensure it is working. 4. Contact manufacturer.

iPod

Symptom	Cause	Resolution
iPod doesn't work.	Typically the cable is loose	<ol style="list-style-type: none"> 1. Ensure the iPod cable is securely connected to the unit. 2. Retest iPod to ensure it is working. 3. Contact manufacturer.

Workout History

Symptom	Cause	Resolution
No workout history generated	<p>There are several possible causes:</p> <ul style="list-style-type: none"> • The cardio machine model does not record workouts. • CSAFE may not be enabled • CSAFE cables may be loose or not properly installed. 	<ol style="list-style-type: none"> 1. Confirm with manufacturer that machine is intended to be compatible with CSAFE equipment. 2. Refer to product manual to ensure CSAFE is enabled. 3. Test the machine to see if you can generate workout statistics. 4. Call the manufacturer for further assistance.

Appendix A. Gateway Technical Specification

Chassis:

Form Factor: 10.2" x 2.3" x 7.3"

Electrical: 12v

Connectivity: Dual Ethernet Ports

Storage: 500 GB

Operating System: Linux (Netpulse Custom Variant) Ubuntu 10.04

IP Configuration:

The Gateway will receive an IP address from the Club Network (either static or DHCP) and will issue IPs to each Netpulse-compatible screen via DHCP on a separate subnet (e.g., 10.4.6.2) than the host network.

The Gateway establishes an outbound VPN connection to Netpulse Cloud Controller for service and remote monitoring. The VPN is perpetual and will automatically reestablish if the connection is lost. VPN uses TCP and encrypted UDP protocol.

If your firewall blocks any outbound ports, a single port will be assigned to you that will need to be open, as all services will be re-routed over that one port.

Internet Traffic (Daytime):

All traffic below uses port 80.

Typical network usage averages 10 workouts per machine per day.

User Sign-in: 100 bytes per workout (sent at start of a workout).

Saving session data: 2kb per workout (sent at the end of a workout).

Club messaging: 6kb per workout (sent during the workout).

RSS feed-updates: 80kb per club every 4 hours to the Gateway (time interval can be adjusted)

Internet Traffic (Nighttime):

All traffic below uses port 80

Video Programming: 250 MB nightly per club

Application Updates: 10MB 20x per year per club

User Interface Updates: 8MB 3x per year per club

N5i Units:

Coaxial Connection: Standard (75 ohm) terminated in a F-Connector Port

Electrical: 1.0 amps of 120 volt AC

Network Connection: Ethernet connection terminated in a RJ-45 jack – this must be wired back to the Netpulse Gateway so it is on the same subnet to permit remote updates.

Appendix B. Technical Specifications

The following table describes the details of the network, TV, and electrical components of the system. Components should meet the following component criteria.

System Component	Explanation
Data (Cat-5e or Cat-6 for Network Cabling)	<p>Pin Out Information: 1) White/Orange 2) Orange 3) White/Green 4) Blue 5) White/Blue 6) Green 7) White/Brown 8) Brown. (T568B: Straight through data cable). Number all jacks at Netpulse equipment location. Numbering should correspond to patch panel at data equipment location. Note: Data line needs to be terminated into the phone closet (patch panel is recommended).</p> <p>Standards:</p> <ul style="list-style-type: none"> • New network cabling must be installed according to BICSI and TIA standards and tested to meet ANSI/TIA-568-C.2 <i>“Commercial Balanced Twisted-Pair Telecommunications Cabling and Components Standard”</i>. • Pre-existing cabling must pass basic Qualification tests for speed and continuity. • RJ45 test plugs shall fall within the values specified in ANSI/TIA-568-C Annex C for NEXT, FEXT and Return Loss.
TV (Coaxial Cable for TV)	<p>TV: 75 Ohm Standard TV Hook-Ups. (RG 6, F Connector) Note: TV lines must be connected to TV source and signal strength must be tested. If required, TV signal amplifier must be installed.</p> <p>Standard: Analog TV signal must be tested at each coax cable termination and tuned to fall within the range of -4dB and -12dB signal loss.</p>
Electrical	<p>1.0 amp @ 120 VAC per Netpulse screen. Netpulse does not require dedicated circuits. Netpulse requires an electrical outlet in the phone closet to support the Internet connection. Data and TV must be run in separate conduit from the electrical.</p>

Table 1. System Components and Details

*There should be no exposed TV or data wiring.

*Netpulse recommends that clubs adhere to the American Disabilities Act (ADA) requirement of 36 inches for the spacing of walkways.

Appendix C. TV Signal Specifications

The TV signal source is either analog or digital. It is likely the source is already configured for the facility. If not, see the following.

Analog

If your facility has traditional cable TV (analog) you can run the coaxial cable directly to the Netpulse screens and connect to the coaxial connector on the back of the screen.

Analog TV signal must be tested at each coax cable termination and tuned to fall within the range of -4dB and -12dB signal loss.

Digital

If your facility has digital cable or satellite TV service (Dish or DirecTV) which requires a box from the cable/satellite provider to view the signal you will need to have a head-end in place to be able to view and change all TV channels from your Netpulse screens (or any personal screen device). A local Audio Visual contractor will easily be able to create a system.

- a. You will need as many cable/satellite boxes as channels you wish to display in the club. If you would like to have 8 channels available then you will need 8 boxes. The individual channel you choose (e.g. –ESPN) can be changed at any time but you will need to add additional boxes to have additional channels.
- b. The output of each of these boxes will go into a modulator that will assign a channel number for each box. This is the channel you will choose from the TV or Netpulse screen. So for example, in the below figure you would select channel 7 to view CBS since the box with CBS has been assigned to channel 7.
- c. The signal from each modulator will then be combined (via a combiner) into a single coaxial cable.
- d. The coaxial cable will now contain all the channels in your system and can be run to anywhere in the facility and displayed on any TV (including) the Netpulse screens.

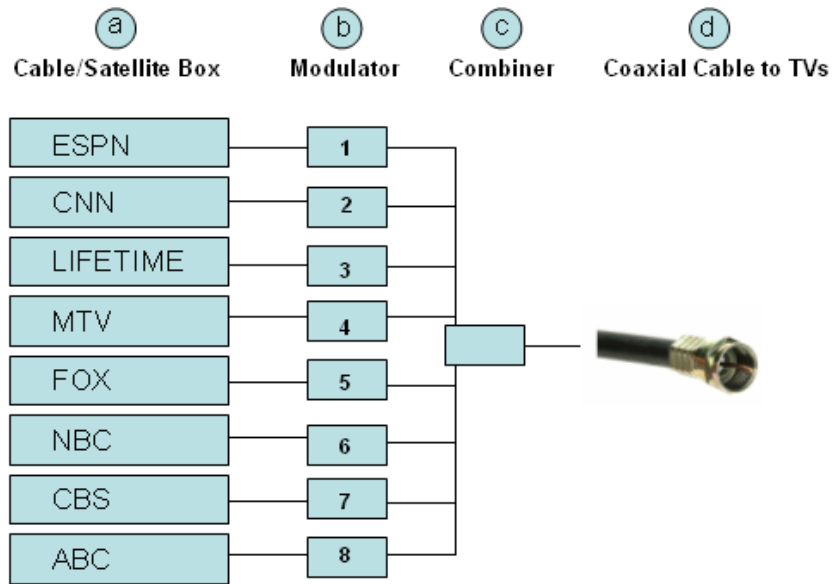


Figure 8. Coaxial Cable Setup

Appendix D. Network Switches

If you choose a Wired installation, you will need to purchase your own network switch. (If you choose Wireless with Accucode, then a switch will be included as part of your quote from Accucode.)

Netpulse strongly recommends the use of a **dedicated, unmanaged switch** for data communication between the Netpulse Gateway and Netpulse-compatible screens (i.e. N5i or Netpulse-embedded cardio equipment). In all cases, Gigabit Ethernet switches are required.

Most switches can be purchased online from many suppliers including Amazon.com, TigerDirect.com, Buy.com, NewEgg.com, and more. The following switches are recommended:

Recommended Unmanaged Switches

Manufacturer	Model	Description	Price Range
Netgear	JGS524	24-Port Pro Safe Gigabit Switch	\$200-230
D-Link	DGS 1024D	24-Port Gigabit Switch	\$170-200
Netgear	GS116	16-Port ProSafe 10/100/1000 Gigabit Switch	\$125 - \$160

A **managed switch** may be used subject to the following requirements:

- Ports 80 (TCP) and 1506 (UDP) must be open outbound.
- Netpulse does not support switches with QoS enabled.
- Media broadcasting and downloads must not be restricted.
- If IP filtering is enforced, certain IP addresses must be permitted access for remote monitoring/diagnostics and routine content and software updates. Please call Netpulse Support (1-877-NETPULSE ext 2) for details.
- Access to the following websites must be allowed: ec2.netpulse.net, google.com, cbs.com.

Recommended Managed Switches

Manufacturer	Model	Description	Price Range
Cisco	SRW248G4	48-port Managed 10/100/1000 Gigabit Switch	\$355 - \$560
Cisco	SRW224G4	24-port Managed Switch w/Gigabit uplinks	\$220 - \$360

Hubs may be used to extend Cat-6 to multiple Netpulse-compatible machines from a single home run from the Gateway. The following hubs are recommended:

Recommended Hubs

Manufacturer	Model	Description	Price Range
Netgear	GS108	8-Port Gigabit Switch (Hub)	\$60-80
Zonet	ZFS3018P	8-Port Fast Ethernet Switch (Hub)	\$12 – 20