

Allworx 48x Installation Guide



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1 Installation Overview

Installation of the Allworx® 48x involves the following steps:

1. Unpacking
2. Mechanical Installation
3. Electrical Installation
4. Server Configuration
5. Network Installation
6. Telephony Installation
7. T1 Installation
8. Accessories Installation

Each of these steps will be described in the following sections.

2 Unpacking

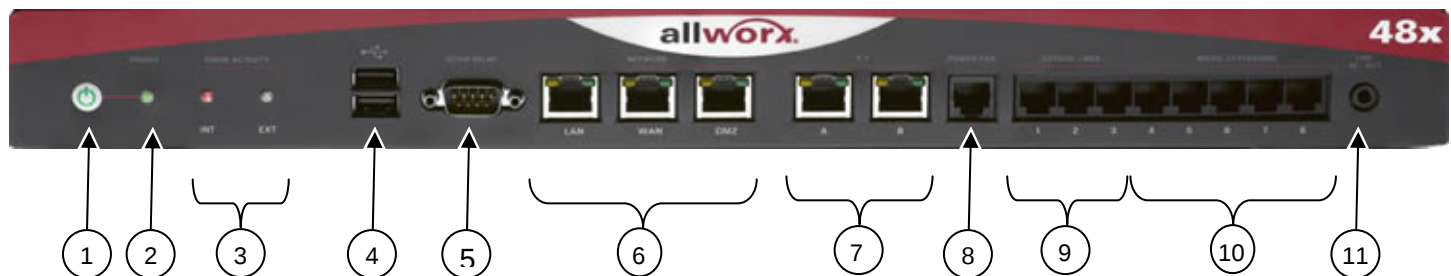
Open the box and carefully unpack it. Save all shipping and packaging materials. Verify all items against the parts list shown in Table 1. If any items are missing, contact your dealer or Allworx Customer Support at 866-255-9679.

Quantity	Item	Part Number
1	Allworx 48x Server	7502600
1	Power Cord	3000100
1	48x Installation Instructions	5000221
1	Sheet that has 4 Rubber Feet for Table Mounts	4122181
1	Rack and Wall Mount Hardware Kit	4100180

Table 1: Parts List

3 Chassis Views

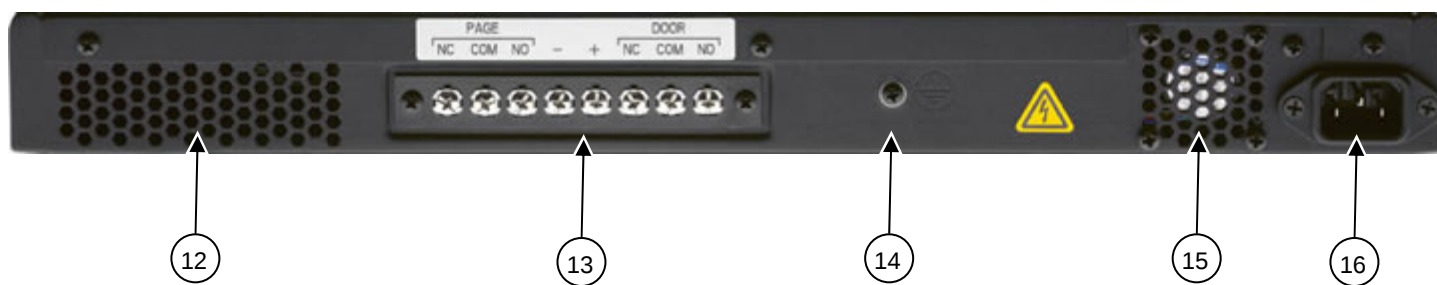
Figure 1: Front Chassis View



- 1 Power switch
Press & Release – Normal shutdown within a few seconds
Press & Hold – Forced shutdown
- 2 Power LED – Indicates system start up activity
- 3 Activity LEDs – Green indicates mounted drive; blinking light indicates activity
- 4 Two (2) USB Host Ports
- 5 Door relay port
- 6 RJ-45 10BaseT/100BaseTX Auto-Sensing Auto-MDI/MDIX Local Area, Wide Area, and Demilitarized Zone (DMZ)* Network Ethernet ports.
- 7 T1 Ports (A/B)
- 8 RJ-11 Power Fail analog phone connector
- 9 RJ-11 loop-start FXO for central office connection (Ports 1-3)
- 10 RJ-11 FXS ports for inside extensions (Ports 4-8)
- 11 3.5 mm stereo audio mini jack for music-on-hold (input) and overhead paging (output)

* Future Feature

Figure 2: Rear Chassis View



- 12 Air intake vent
- 13 Terminal block for door relay or paging amplifier
- 14 Permanent ground connecting screw
- 15 Air exhaust vent
- 16 IEC Power cord connector

4 Mechanical

4.1 Tabletop Placement

To install the Allworx 48x on a tabletop or shelf:

1. Remove the four rubber feet from the packaging.
2. Remove the paper backing from each rubber foot.
3. Turn over the chassis and place one foot at each corner on the bottom of the chassis.

4.2 Rack Mount

To mount the Allworx 48x, 1U high rack mount, inside of a standard 19 inch rack:

1. Verify that there is sufficient clearance around the server's front and rear panels to allow power, network, and telephony connections.
2. Place the brackets so that the smaller face of the bracket extends away from the front of the unit to accommodate installation into the rack (See Figure 3).
3. Install the mounting brackets on each side of the server chassis using the four 6-32 flat head screws.
4. Proceed to the *Power Connection* (Section 5.1) instructions and perform the steps appropriate for your installation before placing the system into the rack.
5. Install the server into the rack using appropriate hardware.

Figure 3: Rack Mount Bracket Installation



4.2.1 Consider When Mounting

- **Elevated Operating Ambient** - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (40°C).
- **Reduced Air Flow** - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading** - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading** - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- **Reliable Earthing** - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

4.3 Wall Mount

Note: For wall mount installations, discard included power cord and use only a UL listed power cord of type SJ or SO or better.

To mount the Allworx 48x on ½" drywall:

1. Verify that there is sufficient clearance around the server's front and rear panels to allow power, network, and telephony connections. Place the brackets on each side of the unit so that the smaller face of the L-Bracket is facing down (See Figure 4).
2. Install the mounting brackets on each side of the server chassis using the four 6-32 flat head screws.
3. Use 50lb self-drilling drywall anchors rated for at least 20 lbs with screws that are either #6 or #8. Locate two anchors that will support the upper end of the unit using the wall mount diagram. Install the anchors per the anchor manufacturer's recommendation. Install the mounting screws through the bracket holes and into the anchors.
4. Tighten screws so that Allworx server is secured firmly against the wall.

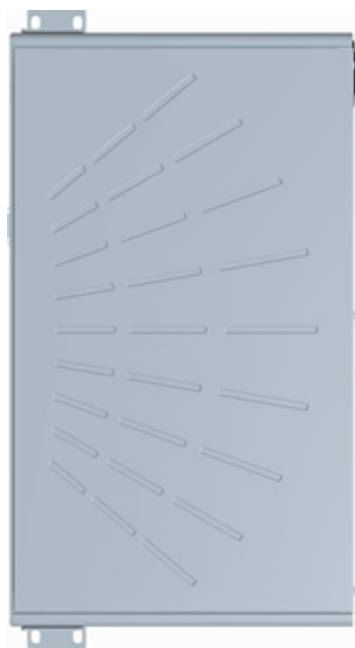
Caution: The Allworx server must be securely mounted to the wall to avoid equipment damage or personal injury.

Note: The unit must be mounted with the front facing left or right, not up or down (See Figure 5).

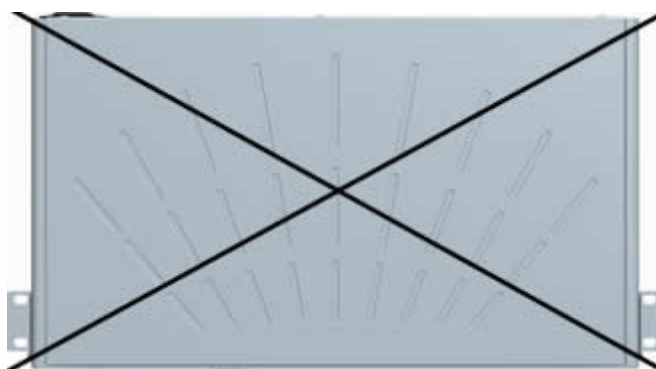
Figure 4: Wall Mount Bracket Installation



Figure 5: Wall Mount Orientation



Correct Orientation



Wrong Orientation

5 Electrical

5.1 Power Connection

Warning: Failure to follow these steps may result in equipment damage, personal injury, and a voided product warranty.

Insert the female end of the power cord into the receptacle on the rear of the unit. Connect the other end to the power source. The product is rated 115/230 VAC, 1/0.7A, and 50/60Hz. The Allworx server will automatically begin to power up once the power has been stable for a few seconds. This is part of the design to automatically boot up after a power failure.

5.2 Chassis Ground

Warning: Failure to follow these steps may result in equipment damage, personal injury, and a voided product warranty.

To help prevent electrical shock, the separate protective earthing terminal, located next to the power jack on the rear panel, must be permanently connected to earth using 18 AWG wire or larger. (See Figure 2, item 14)

5.3 Power-Up Sequence

As the Allworx server progresses through the power up sequence, the front panel lights will respond as shown in Table 2.

Front Panel Light	Power-Up Sequence Description
Power	Flashes green as the power up sequence progresses; steady green when the unit is ready.
Activity – INT	Solid green when internal drive mounted; blinking light indicates activity.
Activity – EXT	Solid green when USB device attached and enabled; blinking light indicates activity.

Table 2: Front Panel Lights During Power-Up Sequence

5.4 Safe Mode Sequence

With the unit powered off, press and hold the power button for more than 1 second. Release the power button once the power light turns amber. As it progresses through the safe mode power up sequence, the front panel lights will respond as shown in Table 3.

Front Panel Light	Power-Up Sequence Description
Power	Turns amber to indicate a safe mode boot has been initialized; Flashes green as the power up sequence progresses; Steady amber when the unit is in safe mode.
Activity – INT	Off

Table 3: Front Panel Lights During Safe Mode Sequence

6 Server Configuration

The Allworx 48x provides an administrative interface to configure and administer the server. The administrative interface is accessed using a web browser. Assuming the network settings are set to their factory defaults, the steps to connect to this interface are:

1. Plug your PC into the server's LAN port.
2. Set up the PC's network interface to obtain an IP address automatically (using DHCP).
3. Verify that the PC has an IP address on the 192.168.2.x network. You may need to release and renew the PC's IP address to get an address from the server.
4. Open your browser and enter the URL of <http://192.168.2.254:8080>.
5. When the "Welcome to Allworx" page appears, login using the default password: admin.

When the Home page appears, click on the Install Checklist link (on the left hand side) to bring up a new window containing steps necessary to set up a new system. Each brief step description is followed by a link to get to the appropriate administrative web page to execute the step. These steps are ordered to aid in a successful configuration. Most of the web pages used to execute each step contain detailed feature descriptions and help instructions that are required to carry out the step. Use the *Allworx System Administrator's Guide* ** as a supplement for the information on the web pages when necessary.

If the server has been previously configured for another installation, you should restore it to its factory default configuration. This can be done by:

1. Rebooting the server to Safe Mode by holding down the power button when the server is off, or selecting Maintenance / Restart, and Enter Safe Mode after restart.
2. Format the disk and perform a Software Update (See *Allworx System Administrator's Guide*** for instructions).

** Allworx System Administrator's Guide for the can be found at www.allworx.com

7 Ethernet Connectivity

The Local Area Network (LAN), Wide Area Network (WAN), and Demilitarized Zone (DMZ)* data network ports are 10BaseT/100BaseTX auto-sensing and auto-MDI/MDIX ports.

SIP phones connect to the server just as any other data network device. The phones and the server need to be properly configured. See the *Server Configuration* (Section 6) for more information.

The Allworx 48x is a sophisticated network appliance that must be properly configured before being connected to the LAN, WAN, and DMZ*.

Note: Do not plug any network or ISP service into the server without first properly configuring the server. Failure to heed this warning may result in a disruption of network connectivity with other equipment on the network.

After the unit is properly configured, the LAN, WAN, and DMZ* network infrastructure cables can be plugged in. Standard RJ-45 category 5 network cables must be used.

The LED's on the LAN, WAN, and DMZ* ports are defined in Table 4.

LED Identification	State	Description
Green	Off	No link: the network is not connected
	On	Link: the network is successfully connected
	Blinking	Activity: data is being transmitted or received
Amber	Off	Speed: 10MB/S
	On	Speed: 100MB/S

Table 4: Network Port LED Definitions

* Future Feature

8 Analog Telephony

Caution: To reduce the risk of fire, use only 26 AWG (or larger) UL listed or CSA certified telecommunications line cord.

The server's analog phone connections can be used to connect Central Office (CO) lines or telephone handsets. Table 5 below describes the ports:

RJ-11 Ports	Type	Description
1-3	FXO (loop-start)	Used to connect to Central Office (CO) lines
4-8	FXS	Telephone handsets

Table 5: Analog Telephony Ports

It is recommended that the ports be connected as follows:

- CO Lines: Begin with port 1 and move up.
- Telephone Handsets: Begin with port 8 and move down.

The Power Fail Phone port may be used to connect an analog phone device that is operational in the event that the server loses power or fails. During power failure, it automatically connects to the first outside phone line port (port 1).

Surge protection is provided internally on all telephony interfaces.

9 T1

T1-A and T1-B interface pin-outs for typical service connections as shown in Table 6, may require either a straight through cable or a cross-over cable.

Pin	Description
1	Receive (ring)
2	Receive (tip)
3	Not Used
4	Transmit (ring)
5	Transmit (tip)
6	Not Used
7	Not Used
8	Not Used

Table 6: T1 Connector Wiring

The Allworx 48x is designed for T1 “short haul” use and has a fully integrated Channel Service Unit / Data Service Unit (CSU/DSU). An external CSU/DSU is not required and should not be used. The Allworx 48x should be connected directly to the on-site smart jack or local T1 device using the proper cabling. Do not connect the Allworx 48x directly to the “long haul” wire pairs exiting the building.

Note: Do not plug any network or ISP service into the server without first properly configuring the server. Failure to heed this warning may result in a disruption of network connectivity with other equipment on the network.

After the unit is properly configured, the T1 network infrastructure cables can be plugged in. Standard RJ-45 T1 cables must be used.

The LED’s on the T1 ports are defined in Table 7.

Green	Amber	State Meaning
OFF	OFF	Red Alarm State – No received Signal
ON	OFF	No Alarms or Errors – Good Lock to Line
ON	ON	Amber Alarm State – Remote End error
ON	Blinking	Signal Quality Problem – Error of some kind

Table 7: Network Port LED Definitions

10 Accessories (Optional)

10.1 Line IN/OUT

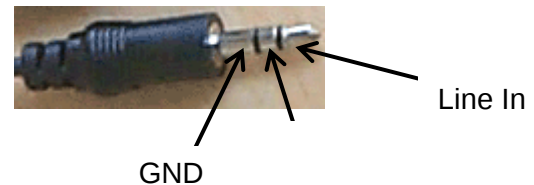
Connect the output from your music and paging system to the server using a Y-Adapter Audio Cable (See Figure 6). Insert the 3.5mm stereo plug (See Figure 7) into the audio connector labeled Line IN/OUT on the front panel (See Figure 1 item 11). A stereo splitter (not included) is required to use both Music-On-Hold and Overhead Paging collectively.

Note: The white audio channel is used for music input and the red audio channel is used for paging output (See Figure 6).

Figure 6: Y-Adapter Audio Cable



Figure 7: Audio Plug Diagram



10.2 Terminal Block

The unit comes with two (2) sets of C-form relay contacts for connecting to external devices such as remote door releases and paging amplifiers. The contacts are rated 30 VDC @1A. Only connect the SELV circuits meeting IEC 60950-1 / UL 60950-1 OR NEC Class 2 circuits. Loop the bare wires of the paging amplifier and/or door relay to the devices corresponding screws (NC, COM, NO) on the terminal block, and then tighten the screws with a screw driver. Additional audio output for paging can be added using the -/+ screws (See Figure 2, item 13).

10.3 Serial Port

In addition to the contacts on the rear terminal block, door relay contacts are available at the serial port connector on the front of the unit (See Figure 1, item 5). The contacts are rated 30 VDC @ 1A. Only connect SELV circuits meeting IEC 60950-1 / UL 60950-1 OR NEC Class 2 circuits.

Warning: Do not exceed the contact rating.

The connector is shared with the serial port (See Figure 1, item 5). The pin-out is shown in Table 8 below.

Pin	Signal	Direction
2 (do not connect)	RX	Input
3 (do not connect)	TX	Output
5 (do not connect)	GND	--
9	Relay COM	--

6	Relay NC	--
1	Relay NO	--

Table 8: Door Relay Pin-Out

11 Physical and Environmental Specifications

Dimensions (W x H x D)	17 x 1.75 x 10 inches (43.2 x 4.4 x 25.4 cm)
Weight (Base Model)	7.5 lbs
Power	115/230 VAC, 1/0.7A, 50/60Hz
Temperature	0° ~ 40° C
Humidity	15% ~ 90% RH, Non-condensing

Table 9: Specifications

12 Regulatory Notices

12.1 FCC Part 68

This equipment complies with Part 68 of FCC rules and the requirements adopted by ACTA. On the bottom of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, provide this number to the telephone company.

A plug and jack to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US:AAAEQ##TXXXX. The digits represented by ## are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact our company. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

12.2 Industry Canada

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operation and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

AVIS: Le présent matériel est conforme aux spécifications techniques d'Industrie Canada applicables au matériel terminal. Cette conformité est confirmée par le numéro d'enregistrement. Le sigle IC, placé devant le numéro d'enregistrement, signifie que l'enregistrement s'est effectué conformément à une déclaration de conformité et indique que les spécifications techniques d'Industrie Canada ont été respectées. Il n'implique pas qu'Industrie Canada a approuvé le matériel.

NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is 0.1. The REN assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

AVIS : L'indice d'équivalence de la sonnerie (IES) du présent matériel est de 0.1. L'IES assigné à chaque dispositif terminal indique le nombre maximal de terminaux qui peuvent être raccordés à une interface téléphonique. La terminaison d'une interface peut consister en une combinaison quelconque de dispositifs, à la seule condition que la somme d'indices d'équivalence de la sonnerie de tous les dispositifs n'excède pas 5.

12.3 Radio and Television Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee, however, that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

You may also find helpful the following booklet, prepared by the FCC: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402.

Changes and Modifications not expressly approved by the manufacturer or registrant of this equipment can void your authority to operate this equipment under Federal Communications Commissions rules.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numérique de la class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.