RS485-FD installation guide

The RS485-FD Converter allows your computer and Phason software to communicate with Phason devices.

The RS485-FD includes the following items.

◆ Instruction sheet

◆ RS485-FD Converter

◆ Software driver CD

◆ USB cable

Communication overview

A communication channel is a continuous line of cable connecting all devices in the series, in other words, a "daisy chain". The last device on a communication channel must have the termination resistors in place or a termination module installed. For more information, see the installation guide for the particular device.

◆ Single-channel systems: OMNI Select, BinBoss, FlowMiser, See Level, and SupraWare

◆ Multi-channel systems: OMNI Select (optional) and OMNI-4000

Single-channel systems
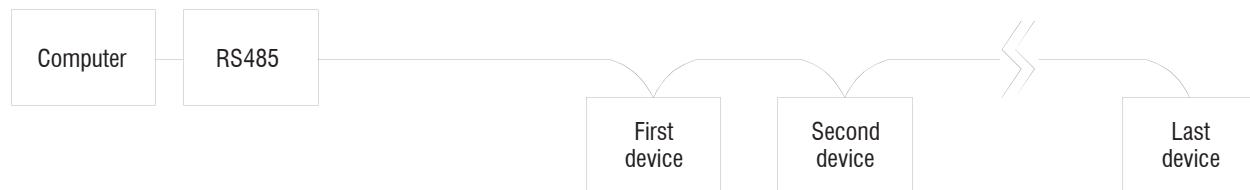
Multi-channel systems

◆ The multi-channel OMNI-4000 system requires an OMNI Server. An OMNI Server has 8 communication channels and can communicate with up to 32 devices on each channel, for a total of 256 devices.

◆ The multi-channel OMNI Select system requires a Phason Communication Hub (PCH). The PCH has 4 communication channels and can communicate with up to 64 devices.
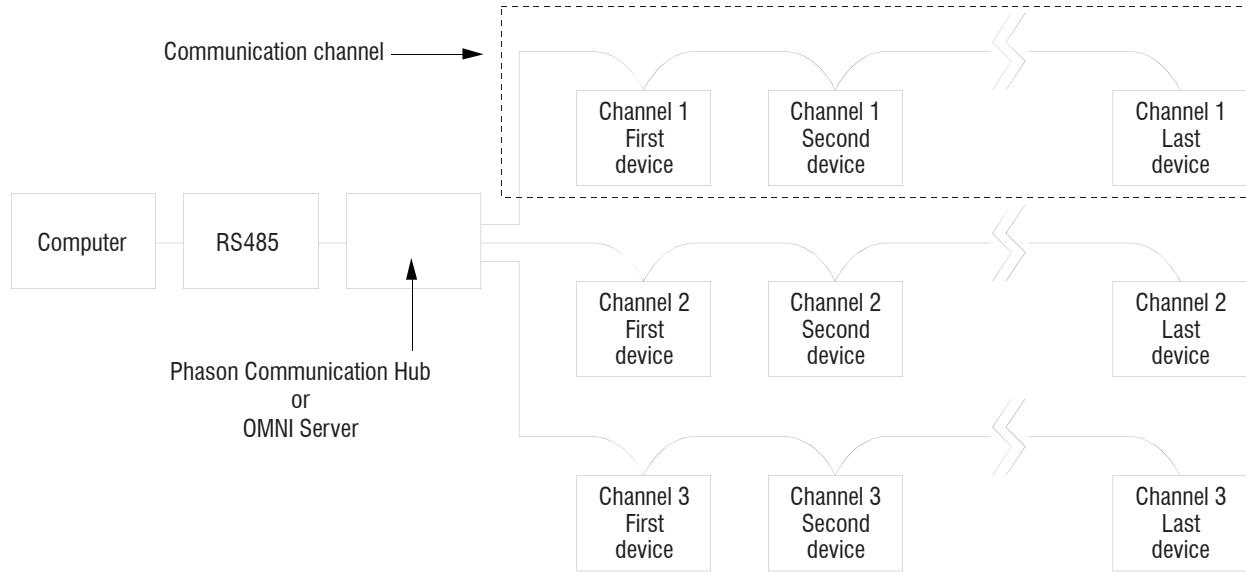
Communication cable requirements

The following types of cable are acceptable. Phason does not recommend other types of wire.

◆ Unshielded twisted pair (UTP), category 5 (CAT5)
◆ Shielded twisted pair (STP), CAT5

Installing the RS485-FD Converter

There are three steps to installing the RS485-FD Converter:

1. Connecting the communication and common reference wiring
2. Connecting the RS485-FD to the computer
3. Installing the software drivers on the computer

Connecting the communications

Read **Proper connector alignment and wiring** on page 3 and **Common mistakes in communication wiring** on page 3 before connecting the communication wiring.

Proper connector alignment and wiring

There are three possible connector types on Phason devices. The four-positions, **A B C D**, are common to all models. Some models have five positions and include **E** for common reference wiring. The six-position connectors that include position **1** are included on the RS485-FD, Phason Communication Hub, and OMNI Alarm Manager.

Four-pin connector	Five-pin connector	Six-pin connector
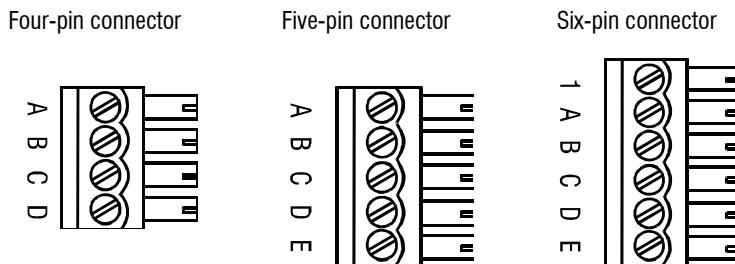
Using consistent wiring helps eliminate communication connection errors and makes troubleshooting much easier. Use the wire colors shown below when connecting all devices to the communication system.

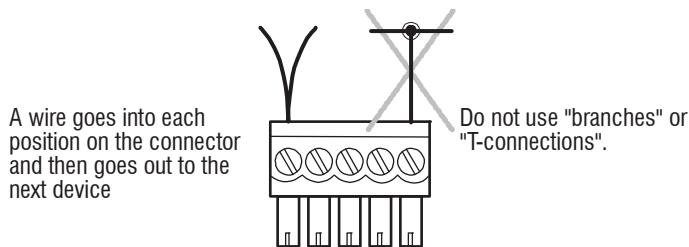| Wire function	RS485	PCH (if installed)	All devices
1 alarm signal*	**1** white/green	**1** white/green	
A communication	**A** blue	**A** blue	**A** blue
B communication	**B** white/blue	**B** white/blue	**B** white/blue
C communication	**C** orange	**C** orange	**C** orange
D communication	**D** white/orange	**D** white/orange	**D** white/orange
E common reference	**E** green	**E** green	**E** green
* Used only in OMNI Select systems with the Phason Communication Hub (PCH), and OMNI-4000 systems with the OMNI Alarm Manager (OAM). For information about connecting a PCH, OMNI Server, or OAM, see the installation guide for that specific product.			

Common mistakes in communication wiring

◆ **Not using the correct type of communication cable** – the communication cable must be twisted pair cable, category 5 (CAT5). You can use either unshielded twisted pair (UTP) or shielded twisted pair (STP) cable. Phason does not recommend other types of wire.

There are additional guidelines to follow when using STP cable. For more information, read **Using shielded twisted pair (STP) cable** on page 4.

◆ **Not continuing the communication wiring properly** – all the devices on the communication channel must be connected in series (in a daisy chain) and the wire must be continued properly from one device to the next. When continuing the communication wiring from one device to the next, the wires must be connected as shown in the following diagram.

A wire goes into each position on the connector and then goes out to the next device

Do not use "branches" or "T-connections".

◆ **Not terminating the last device on the communication channel** – on all systems, the last device on the communication channel must have the termination resistors in place or a termination module installed. You must remove the termination resistors from all devices, except the last one on the communication channel.

The termination resistors are located on the circuit board of all networkable devices, except the Supra and PBx Power Block. There are no termination resistors on Supras and PBx Power Blocks; those controls must have a Termination Module installed on the last device. The Termination Module connects to the communication socket on the last device. For information about Termination Modules, contact your dealer or Phason Customer Support.

The termination resistors on Power Block models PB-1 to PB-6 are in sockets on the Micro Board and can be removed and replaced if necessary. Termination resistors on all other models must be removed using wire cutters. For more information about the location of termination resistors, see the installation guide for your specific product.

If you remove the termination resistors from the last device by mistake, you will have to install a Termination Module on that device.

◆ **Running the communication cable in the same conduit as, or beside AC power cables** – routing communication cable in the same conduit as, or beside AC power cables, can cause electrical interference and communication failures. Follow the guidelines below when routing communication cable.

  ◆ Do not run the cable in the same conduit as AC power cables.

  ◆ Do not run the cable beside AC power cables or near electrical equipment.

  ◆ When crossing other cables or power lines, cross them at a 90-degree angle.

Using shielded twisted pair (STP) cable

The advantage of using STP cable is that it can improve communications by reducing electromagnetic interference. The drawback of STP cable is that it requires more care during installation. If the shielding is connected incorrectly, shielded cable can cause more problems than it solves.

How to install shielded cable

When installing shielded cable, you must connect the shielding to the building ground at one end only. Phason recommends connecting the cable to the building ground near the computer.

When connecting the devices along the communication channel (daisy-chain), connect the shielding of the incoming cable to the shielding of the outgoing cable. Do not connect the shielding to the device or to anything else. At the last device on the daisy chain, do not connect the shielding; leave it unconnected.
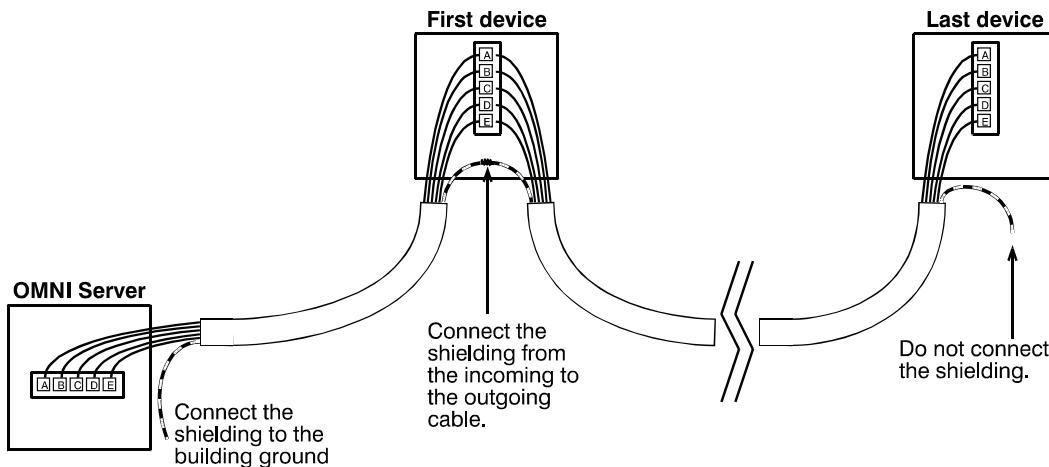
Connecting the communication and common reference wiring

Follow the instructions below to connect the communication wiring.

> ◇ For controls having only four-position connectors, it is a good idea to leave the communication cable one foot longer than is needed for connecting to the terminals (**A**, **B**, **C**, and **D**). You can then use the extra length of wire to connect to a reference point on the circuit board in place of the **E** terminal.
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> ◇ For information about which terminal to use in place of the **E** terminal, see the user manual for the specific device, or contact Phason Customer Support.

**To connect the communication wiring**

1. Connect all the devices in series. For example, **A** on the RS485-FD to **A** on the first device, to **A** on the second device, and so on. Use the wires specified in the table on page 3 and follow the guidelines on page 3.

2. Remove the termination resistors from each device, *except for the last one on the communication channel*. The last device *must* have the termination resistors in place. For the location of the termination resistors, see the installation guide for each specific product.

Connecting the RS485-FD to the computer

After connecting the communication and common reference wiring to all the devices, connect the RS485-FD to the computer.

To connect the RS485-FD to the computer

1. Plug the communication connector into the communication socket on the RS485-FD.

2. Connect the square end of the USB cable to the RS485-FD and the rectangular end directly to one of your computer's USB ports.

To one of the computer's USB ports

To the Phason Communication Hub,
OMNI Server, or first device

1ABCDE
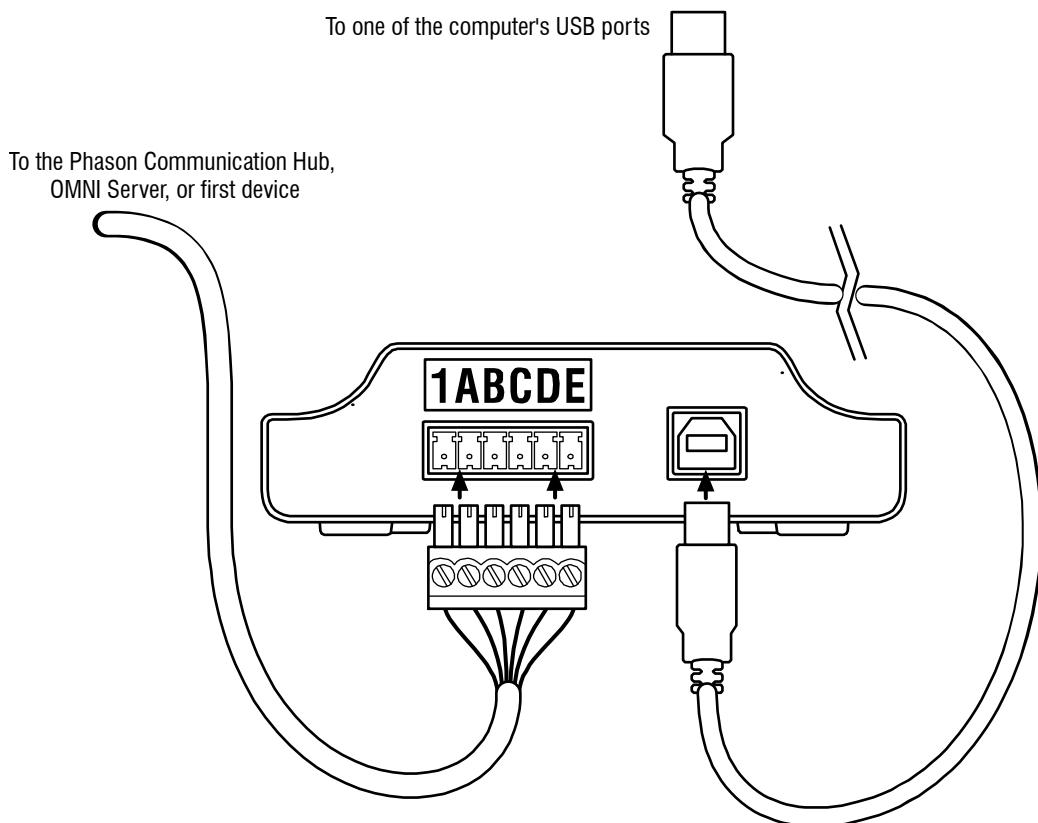
NOTE	◇ Because of the RS485 power requirements, if you are using a USB hub, it must be one that has an external power supply, *not one powered from the computer's USB port*.
	◇ If this is the first time you have connected the RS485-FD to the computer, your operating system (Windows XP, Vista, or 7) will tell you that it has detected new hardware and ask to install the drivers. Read the next section before installing the drivers.

Installing the software drivers

The first time you connect the RS485-FD, your operating system will ask you for software drivers. Software drivers tell the computer how to operate the RS485-FD.

There are two drivers to install: one called **USB Serial Converter**, the other called **USB Serial Port**. The drivers are on the CD that came with the RS485-FD package.

After both drivers have been successfully installed, the power LED on the RS485-FD should light up green.

To install the software drivers

1. Insert the CD into your computer's CD/DVD-ROM drive.
2. Connect the RS485-FD to one of your computer's USB ports.
3. Follow the instructions on the screen to install the driver for the USB Serial Converter from the CD.
4. Repeat step 2 for the USB Serial Port driver.

> NOTE
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> For Windows 7 installations with no Internet connection, or if you get a "Device Not Installed" Message:
> 1. Go To The *Start Menu*, Type *Device Manager* In The Search Box, And Then Press **Enter**.
>   The Device Manager displays.
> 2. Click *Other devices*.
> 3. Right-click *USB Serial Port* and then choose *Update Driver Software*.
>   The Update window displays.
> 4. Click *Browse my computer*.
> 5. Click **Browse** and then select the CD/DVD drive containing the installation CD.
> 6. Click **Next**.
>   Windows installs the driver.
> 7. Restart the computer.

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