

# Understanding Foreign Exchange Office (FXO) Voice Interface Cards

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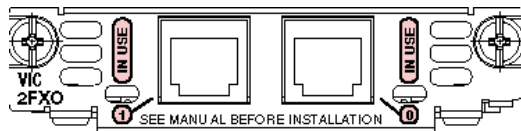
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## Introduction

The Cisco Foreign Exchange Office (FXO) interface is an RJ-11 connector that allows an analog connection to be directed at the public switched telephone network's (PSTN's) central office or to a station interface on a private branch exchange (PBX). The FXO sits on the switch end of the connection. It plugs directly into the line side of the switch so the switch thinks the FXO interface is a telephone.

**Note:** The FXO Voice Interface Card (VIC) is not the same as a Foreign Exchange Station (FXS) card and therefore does not provide dial tone. Do not plug a telephone set to the FXO VIC.



## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

This document is not restricted to specific software and hardware versions.

### Conventions

Refer to [Cisco Technical Tips Conventions](#) for more information on document conventions.

## Product Numbers

Product Number	Description

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- Excellent
- Good
- Average
- Fair
- Poor

This document solved my problem.

- Yes
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Suggestions for improvement:

(256 character limit)

VIC-2FXO	Two-port FXO VIC
VIC-2FXO-EU	Two-port FXO for Europe
VIC-2FXO-M1	Two-port FXO for U.S. with battery reversal
VIC-2FXO-M2	Two-port FXO for Europe with battery reversal
VIC-2FXO-M3	Two-port FXO for Australia
VIC-4FXO-M1	Four-port FXO for U.S. with battery reversal only for the MRP
VIC2-2FXO	Two-port VIC – FXO (Universal). Also supports Centralized Automatic Message Accounting (CAMA) with software configuration
VIC2-4FXO	Four-port VIC – FXO (Universal). Also supports CAMA with software configuration
MRP3-8FXOM1	Eight-port FXO M1 card for the MRP

## Features

Product Number	Description
Voice Ports	Two, four, or eight FXO ports
Connections	<p>Connects to a telco line or to a PBX or key set that emulates a telco line. Uses RJ-11 connectors.</p> <p><b>Note:</b> The end to end connection between the CO RJ11 jack and the router voice-port must be a straight-through connection. This means that TIP goes to TIP and RING to RING. Normally the CO provides an interface for which a standard rolled RJ11 cable may be used since the resulting connection is straight. However, sometimes the CO may not reverse the pinouts and therefore a straight RJ11 cable is needed.</p> <p>Defintions:</p> <ul style="list-style-type: none"> <li>• Pinouts for Rolled RJ11 Cable =&gt; TIP to RING, RING to TIP</li> <li>• Pinouts for Straight RJ11 Cable=&gt; Tip to TIP, RING to RING</li> </ul>

	Also note FXO ground-start services are polarity-sensitive and undesirable behavior, such as failed calls, will occur if proper polarity conventions are not observed.
Cisco IOS® Software Feature Set	Requires a Plus feature set.
Caller ID	Requires VIC-2FXO-M1, VIC-2FXO-M2, VIC-4FXO-M1, VIC2-2FXO, VIC2-4FXO, or MRP3-8FXOM1
Battery Reversal	Requires VIC-2FXO-M1, VIC-2FXO-M2, VIC-4FXO-M1, VIC2-2FXO, VIC2-4FXO, or MRP3-8FXOM1
Ground Start	Requires VIC-2FXO, VIC-2FXO-M1, VIC-2FXO-M3, VIC-4FXO-M1, VIC2- 2FXO, VIC2-4FXO, or MRP3-8FXOM1
Loop Start	Supported on all cards.

## Configuration

For configuration of voice features in Cisco IOS Software, refer to [Voice over IP for the Cisco 3600 Series](#).

**Note:** In Cisco IOS Software, issue the **voice-port <slot>/<VIC slot>/<unit>** global configuration command to configure the voice port parameters.

The commands to configure VoIP on Cisco routers are very similar on all of the router platforms shown below.

For configuration of voice features in Catalyst OS (CatOS) on a Catalyst 4000, see [Configuring Voice Interfaces](#).

## Platform Support

The following table shows which platforms support the various FXO VICs including Cisco IOS Software release support selection.

**Note:** The original VIC only works in NM-1V and NM-2V network modules, and VIC2 only works in NM-HD-1V, NM-HD-2V, and NM-HD-2VE. These are not interchangeable.

Cisco IOS Software Support 1	1750 2	1751 2	1760 2	VG200	2600, 3620	2600XM, 2691, 3725, 3745			3640 3, 3660 3			2811 4, 2821 4, 2851 4	3825 4, 3845 4	<a href="#">MRP ICS7750</a>	<a href="#">IAD2431, IAD2432</a>	Catalyst 4000
Carrier Module	Not Required	Not Required	Not Required	<a href="#">NM-1V, NM-2V</a>	<a href="#">NM-1V, NM-2V</a>	<a href="#">NM-1V, NM-2V</a>	<a href="#">NM-HD-1V, NM-HD-2V, NM-HD-2VE</a>	<a href="#">NM-HDV2</a>	<a href="#">NM-1V, NM-2V</a>	<a href="#">NM-HD-1V, NM-HD-2V, NM-HD-2VE</a>	<a href="#">NM-HDV2</a>	<a href="#">NM-HD-1V, NM-HD-2V, NM-HD-2VE, NM-HDV2</a>	<a href="#">NM-HD-1V, NM-HD-2V, NM-HD-2VE, NM-HDV2</a>	Not Required	Not Required	<a href="#">WS-X4604 AGM</a>
VIC-2FXO	All Versions	All Versions	All Versions	12.1(3)T	All Versions	All Versions	Not Supported	Not Supported	All Versions	Not Supported	Not Supported	Not Supported	Not Supported	12.2(1)XD	12.2(1)XD	12.1(3a)XI

VIC-2FXO-EU	All Versions	All Versions	All Versions	12.1(3)T	11.3(6)T, 12.0(2), 12.0(2)T, 12.0XX, 12.1, 12.1T, 12.2, 12.2T,	All Versions	Not Supported	Not Supported	11.3(6)T, 12.0(2), 12.0(2)T, 12.0XX, 12.1, 12.1T, 12.2, 12.2T,	Not Supported	Not Supported	Not Supported	Not Supported	12.2(1)XD	12.2(1)XD	12.1(3a)XI
VIC-2FXO-M1	12.2(2)XJ	12.2(2)XJ	All Versions	12.1(3)T	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	All Versions	Not Supported	Not Supported	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	Not Supported	Not Supported	Not Supported	Not Supported	12.2(1)XD	12.2(1)XD	Not Supported
VIC-2FXO-M2	12.2(2)XJ	12.2(2)XJ	All Versions	12.1(3)T	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	All Versions	Not Supported	Not Supported	12.0(7)XK, 12.1(2)T, 12.2, 12.2T	Not Supported	Not Supported	Not Supported	Not Supported	12.2(1)XD	12.2(1)XD	Not Supported
VIC-4FXO-M1	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	12.2(8)YN, 12.2(15)ZL	12.2(8)YN, 12.2(15)ZL	Not Supported
VIC-2FXO-M3	12.1(5)T, 12.2, 12.2T	12.1(5)T, 12.2, 12.2T	All Versions	12.1(3)T	11.3(6)T, 12.0(2), 12.0(2)T, 12.0XX, 12.1, 12.1T, 12.2, 12.2T,	All Versions	Not Supported	Not Supported	11.3(6)T, 12.0(2), 12.0(2)T, 12.0XX, 12.1, 12.1T, 12.2, 12.2T,	Not Supported	Not Supported	Not Supported	Not Supported	12.2(1)XD	12.2(1)XD	Not Supported
VIC2-2FXO	Not Supported	12.2(15)ZL, 12.3(4)T, 12.3(4)XG, 12.3(5)	12.2(15)ZL, 12.3(4)T, 12.3(4)XG, 12.3(5)	Not Supported	Not Supported	Not Supported	12.2(15)ZJ, 12.3(4)T	12.3(7)T	Not Supported	12.2(15)ZJ, 12.3(4)T	12.3(7)T	12.3(8)T4	12.3(11)T	Not Supported	Not Supported	Not Supported
VIC2-4FXO	Not Supported	12.2(15)ZL, 12.3(4)T, 12.3(4)XG, 12.3(5)	12.2(15)ZL, 12.3(4)T, 12.3(4)XG, 12.3(5)	Not Supported	Not Supported	Not Supported	12.2(15)ZJ, 12.3(4)T	12.3(7)T	12.3(7)T	Not Supported	12.3(7)T	12.3(8)T4	12.3(11)T	12.2(15)ZL	12.2(15)ZL	Not Supported
MRP3-8FXOM1	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	12.2(8)YN and 12.2(15)ZL	12.2(8)YN and 12.2(15)ZL	Not Supported

<sup>1</sup> Voice features require a PLUS image in the Cisco IOS Software classic feature-sets, or an appropriate selection from the list of the Cisco IOS Software cross-platform feature-sets. For more information, refer to [Product Bulletin No. 2089: Cisco IOS 12.3 Mainline and 12.3T Feature Sets for Cisco 2691 for additional information](#).

<sup>2</sup> On the 1700 voice platforms, one or more PVDMS are needed to support VICs, or voice ports are missed in the active configuration. The PVDMS hold DSPs that make the VICs fully functional, and are installed on the motherboard of the 1700 series. For more information, refer to [Troubleshooting Unrecognized Voice Interface Cards on Cisco 1750, 1751, and 1760 Routers](#). On the Cisco VG200, 2600, 2600XM, 2691,

3600, and 3700 series routers, the carrier network modules (NM-1V, NM-2V, NM-HD-1V, NM-HD-2V, NM-HD-2VE, NM-HDV2) come with the DSPs installed on the module.

<sup>3</sup> Voice is not supported on the Cisco 3631 series router.

<sup>4</sup> The Cisco 2811, 2821, 2851, 3825, and 3845 voice routers do not support the NM-1V and NM-2V voice/fax network modules.

Certain FXO VICs include two jumper headers, W3 and W4, to set loop-start or ground-start mode (see the [Features table](#)). One jumper configures each FXO port. The default setting, which should be satisfactory in most installations, is loop start. In this setting, jumpers are placed over positions 2 and 3 of headers W3 and W4. Most modern central office equipment, such as DMS-100 and 5ESS switches, provides calling party control (CPC) and Ring on Seize on loop-start lines. CPC allows quicker disconnection, and Ring on Seize minimizes glare (collision of inbound and outbound calls on the same interface). If your central office does not provide these features on loop start, you may want to configure the FXO card for ground-start operation instead by moving the jumpers to positions 1 and 2. For proper operation, both jumpers must be configured identically. In most cases, jumper setting should have little or no effect on operation.

The FXO interface configured for GroundStart is polarity sensitive. If you see a 0x22 disconnect cause code from the output of the **debug debug voip ccapi inout** command, you may have the telco ground connected to the FXO ground on the router. This can be caused by an incorrect RJ-11 cable between the FXO port and the telco jack. If you are using a straight through cable try using a crossover, or if you are using a crossover try using a straight through.

The Cisco IOS Software versions provided are typically the minimum version required to support the platform, module or feature in question. To find out a complete list of Cisco IOS Software versions a feature, module, interface card, or chassis is supported in, use the [Software Advisor](#) ([registered](#) customers only) only tool.

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- [Voice Hardware Compatibility Matrix \(Cisco 17/26/28/36/37/38xx, VG200, Catalyst 4500/4000, Catalyst 6xxx\)](#)

- [Voice Technology Support](#)
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