Zhone IMACS Hardware FAQ

1. What is the distance on DS0-DP card?

   DS0DP=500', G.703=50'

2. Does FXS/FXO support caller ID display feature from switch?

For the FXS cards - always. For the FXO cards - it's new and available with Software Release 3.7 (OHD)

3. Can Zhone make some recommendations on the maximum loop length that can be supported by the FXS card using 0.4mm and 0.5mm wire?

The maximum loop length is normally given in ohms. For the FXS card the value is 1800 ohms. So, the conversion process is .4 mm = 26 gauge wire. 26-gauge wire has a resistance of 428 ohms per mile. Therefore, the distance is 1800/428 = 4.2 miles, or 6.76 kilometers. For the .5 mm wire = 24 gauge wire, 24-gauge wire has a resistance of 265.5 ohms per mile. The distance is 1800/265.5 = 6.7 miles or 10.9 kilometers.

4. How far can the FXS card provide current for?

The FXS has a jumper for short loops and long loops. The loop resistance for short loop is a minimum of 300 ohms, and a maximum of 700 ohms. The loop resistance for long loops is a minimum 300 ohms and a maximum 1800 ohms. If you take 1800 ohms and 26-gauge cable, you get a distance of 6.7 km. (assuming 26 AWG, resistance of 428 ohms/mile, and 1.6 km per mile). FXO/FXS return loss for ERL and SRL ---- >= 28dB

5. What are the IMAC's system capacities?

There are several factors regarding capacities on the IMAC's, all of which should be considered when configuring an IMAC's multiplexer. The three main configuration limitation issues are:

- 8 user card slots
- 126 back plane DS0 busses
- User cards assign to specific busses

The main issue here is the back plane bus assignments; There are four back plane busses called the A, B, C, and D bus. All busses will carry 32 DS0 assignment, except the "A" bus, which will carry 30 (2 busses carry system information). So there are 126 possible bus assignments. The back plane busses are used to assign DS0's to user cards of which there are 8 slots. DS0 to DS0 cross connects do not use bus assignments, so the only limit to cross connects is the amount of DS0's available.

All Voice cards (FXS, FXO, and E&M cards) are 8 port cards, and there are 8 user card slots for a total of 64 ports. 1 DS0 for each port, 64 voice paths... Almost. Voice cards will only assign to the A&B busses; the A bus only has 30 usable busses, so 62 voice drop offs per chassis.

The 8220xx SRU card has the same bus issue as the voice cards Ö A&B bus only, so if you are loading a system up with SRU cards, mix in some 8221xx SRU cards. They assign to the C&D bus; you will run out of user ports before you will back plane busses.

When assigning DS0's to HSU cards, watch your back plane assignments. DS0's assigned to HSU cards must all be carried on the same bus, so when assigning super rate data assignment, usually you want to assign the ports with the higher rates first. Then, the lower rates will fill in the leftover spaces on the busses. Just remember, you can do 4 ports of 24x64kbs super rate data and still have 30 back plane assignments left, but there will be 6 on the A bus and 8 on the B,C, and D busses, and, due to the no cross bus rule, you could not add a 5th full T1's worth of data to a single port. You could, however, add many more ports of 2x64kbs or 4x64bps, or even 3 8x64kbs.

Some cards, like the HSU's, assign to the C & D bus first, then the A & B.

This covers the main back plane bus assignment issues, but others may occur. This document is only intended to highlight key points that may be considered on larger systems.

Some of the card primary bus assignments are:

A & B BUS Primary

8119xx, 8129xx, 8139xx (voice), 8212xx HSU, 8220xx, 8230xx, 8228xx, 8249xx, 8231xx

C&D BUS Primary

8202xx, 8215xx, 8214xx, 8203xx, 8247xx, 8248xx, 8260xx, 8261xx, 8262xx, 8221xx

6. Do the alarm cards 8401 & 8402 require a 48 VDC power source when used in an IMACS?

Neither card requires a 48 VDC power source, unless input sensors are to be used.

7. Do I need a power converter for my Ring Generator(s) with a 8902 48 VDC power supply?

No you don't need a converter. All you need is the Ring Generator(s).

8. What power supply requires a converter with the Ring Generators?

901 AC power supply.

8901 Main power supply for AC-powered IMACS units. 120/240VAC, 50 - 60Hz input provides +5V and +12V. It can be used with 8903 Power Converter to provide -48VDC from 120VAC only.

It can be used with 8905 Universal Power Converter to provide -48VDC from either 120VAC or 240VAC. A second 8901 may be installed for load sharing/redundancy. AC Power Supply, 120/240VAC.

9. What converters could I use with the 8901 power Supply?

A 8903 Power Converter to provide -48VDC from 120VAC only. A 8905 Universal Power Converter to provide -48VDC, from either 120VAC or 240VAC. A second 8901 may be installed for load sharing/redundancy. AC Power Supply, 120/240VAC

10. What is a "Ring Generator"?

A Ring Generator is used to supply ringing current for all FXS cards and for FXO cards in Manual Ring Down applications. It provides control of In-rush current during startup and hot insertion. Ring Generator, -48VDC.

11. What are the pinouts to the PM-IOR Card terminal Cable?

PM-IOR Card to DB-25 Terminal Cable Pinouts

PM-IOR Port	PC or Terminal Serial Port
CO	
RJ-45	DB-25
1	5
2	8
3	3
4	Not Connected
5	7
6	2
7	20
8	4

12. What are the pin outs for the IMACS terminal cable?

DB-25 pins to terminals	RM-48 Male pins to interface card
2	6 transmit
3	5 receive
7	4 ground

13. What are DTMF pairs?

Dual-tone multi-frequency (TOUCHTONE dialing as opposed to dial pulse rotary dial) uses two frequencies from two sets of four groups. With DTMF, each key you press on your phone generates two tones of specific frequencies. The chart below shows the combinations:

	Low Group		High Group	
(Hz)	1209	1336	1447	1633
697	1	2	3	4
770	4	5	6	B
852	7	8	9	C
941	*	0	#	D

14. Are all IMACS chassis suitable for us in Europe?

No. 8916 Rev A1 not for use in Europe (E1). Also, in general all 4-digit Rev A1's are not.

15. What ground points should be connected together when installing an IMACS chassis.

None. All are separate and distinct grounds.

16. How do I change the WAN card from T1/DSX to E1/CEPT?

Both 801060 (Dual T1/E1 WAN card) and 800060 (Single T1/E1 WAN card) support T1 and E1. The plug-in Line Interface Module (8110) is changeable between T1 and E1. If you want to change the WAN card from T1 to E1, unplug the plug-in module and change the jumper accordingly. The jumper option configuration is shown on the card itself.

17. What is the functionality of the COMP port on the interface card?

COMP port on the interface card is RS232 computer port. It connects a local device for reporting or printing alarms. Since it only transmits, it does not function as control terminal port (craft port), which you can connect to a PC or an external modem.

18. How do I change 8215 HSU card from 530 to V.35?

An 8215 HSU card supports both 530 and V.35. You can choose either one by switching the black switch (in the middle of the board) to 530 or V.35.

19. What kind of V.35 cable should I use to connect to HSU card?

There are two different versions of HSU cards. One comes with 4 DB26 ports (8215 and 8216). Another comes with 2 DB25 ports (8202, 8203, 8212, 8213 and 8214). 1263F cable is needed to connect V.35 DTE to 8215 HSU card. 1260F cable is used to connect V.35 DTE to 8214 HSU.

20. Can I use the FXS card to simulate E&M circuit?

Yes, you need specify FXS mode as FSXDN under FXS-> Mode.

21. Can the redundant CPU have different software version from the primary CPU?

The redundant CPU needs the same branch software as the primary CPU. For example, if the primary CPU has software 5.1.1, the redundant CPU can be 5.1.2 or 5.1.3, but it can't be 3.x or 4.x.

22. What does the acronym (HSU) stand for and what is the card used for in the IMACS?

High Speed Unit: allows user to connect high-speed data terminal equipment (DTE) and data communications equipment (DCE) to WAN Links, server cards (ADPCM), or another HSU.

23. What does the acronym (SRU) stand for and what is the card used for in the IMACS?

Sub Rate Unit: allows user to multiplex a number of devices into a single, subdivided time slot on a WAN card. SRU ports can also be multiplexed with voice traffic on an ADPCM engine.

24. What does the acronym (FRAD) stand for and what is the card used for in the IMACS?

Frame Relay Assembler Disassembler: is a plug-in user card for the system. It provides users access to the Frame Relay network of carriers through the use of ten on board RS232 ports on the front panel of card.

25. What does the acronym (OCU-DP) stand for and what is it used for in the IMACS?

Office Channel Unit-Data Port: used to interface directly to data service units (DSU)/channel service units (CSU) supporting data traffic up to and including 64kbps.

26. Does the 8804 Bus Connect CPU Support Redundancy?

The model 8800 Bus Connect CPU does not support redundancy other than power supply redundancy. The model of CPUP also supports only one WAN card, which must be installed in slot W1. If the WAN card is a Dual WAN (8010). Drop and Insert from the first WAN port (W1-1) to the second WAN port (W1-2) is supported. Drop and Insert timeslots are mapped one-to-one, meaning timeslot #1 of the first WAN port is mapped to timeslot #1 of the second WAN port, #2 is mapped to #2, etc. The only exception to the Drop and Insert mapping rules is when E1 to T1 conversion is done. In this case, timeslots #1-4 on the T1 are mapped to #1-4 on the E1, #5-8 on the T1 are mapped to #6-9 on the E1, #9-12 on the T1 to the #11-14 on the E1, and so forth, with every fifth timeslot on the E1 skipped.

27. Does the 8800 Bus Connect CPU Support Redundancy?

The 8804 Bus Connect CPU/Redundant Capable supports both CPU redundancy and 1:1 WAN redundancy. In addition to redundancy, the 8804 supports up to two active WAN cards.

When 8804 CPU redundancy is desired, simply order another 8804 CPU with the same software options as the first. When WAN redundancy is required, the first active WAN card will be installed in slot W1, with an identical redundant WAN installed in slot W2. In this case "identical" means a WAN with the same model number (8000 or 8010) and the same plug-in modules (811 and/or 812) configured. An optional second active WAN card can be installed in slot W3, with an identical redundant WAN in slot W4. Note that this 1:1 WAN redundancy is supported only with model 8804 CPUs.

When using two active WAN cards with the 8804 CPUs, there is no Drop and Insert support on the second active WAN (W3), nor is there any cross-connect of traffic from W1 to/from W3. Additionally, remember that there are some user cards which cannot be routed to the second active WAN.

28. What's the difference between the power converter 8903, 8905, and 8908?

   8903 is the power converter from 115VAC to -48VDC, 100W
   8905 converts 115/240VAC to -48VDC, 100W
   8908 converts 115/240VAC to -48VDC, 300W
   8908 is only used in the power enhanced 891930 IMACS 900 chassis.

29. How many T1/E1 does the IMACS support?

The maximum T1/E1 IMACS can support depends on the type of interface card.

   892760 supports 2 E1
   892660 supports 2 T1
   892360, 892261, 892260, and 892060 support up to 8 T1/E1

30. How many redundant features/cards are available in the IMACS?

The following cards have redundant features.

   - Power supply, one redundant power supply available
   - CPU card, one redundant CPU card available
   - WAN card, one redundant WAN card available
   - Ring Generator, four redundant Ring Generators for AC power and five for DC

31. How can I tell if an HSU card is a V.35 or RS-530?

V.35 or RS-530 is physical hardware settings. Either the card is preset by default or you have to manually set the switch. IMACS CPU could not learn which type is which type.

821660, 821570, and 821560,
4 ports, the selection of RS530 or V.35 is made on a port by port basis using on-board switches.

821460, 821360, and 820260,
2 ports, the selection of RS530 or V.35 is made on a port by port basis using on-board switches.

821260,
2 ports, V.35 only

820360,
2 ports, RS530 only

32. How many versions of HSU cards are there?

HSU (High Speed Unit) cards support two protocols, V.35 and RS530, and two interfaces, DB-25 and DB-26. We can provide all the possible combinations.

821660, 821570, 821560 has 4 DB26 connectors and supports both V.35 and RS530 (by on-board switches).

821360, 820160, has 2 DB25 connectors and supports both V.35 and RS520 (by on-board switches).

821460, 821260 has 2 DB25 connectors and supports V.35 only.

820360 has 2 DB25 connectors and only supports RS530.

33. What is an ISDN Primary Rate Interface (PRI) Server?

The PRI Server Card provides flexible access and routing of PRI-based ISDN services. The ISDN PRI Server can be used for enabling applications such as Video Conferencing, Video Broadcast, ISDN Grooming, and Fractional PRI provisioning. The PRI Server card supports B channel bandwidth of 56K, 64K, 384K, 1536K and Multi-Rate speeds where available. Multi-Rate speeds allow the PRI server card to select calls in increments of 64Kbps. In areas where Multi-Rate is not supported by the local ISDN switch, an Inverse Mux (IMUX) Server Card should be used to aggregate individual 64Kbps calls.

34. What voltage does the ring generator provide on the Streamline product?

The ringing generator provides ringing voltage of 105VAC (RMS) at 20 HZ for 24 simultaneous cadence (2 seconds on -4 seconds off) ringing ports or 12 simultaneously continuous ringing voice ports.

35. When is - 48VDC Talk Battery required?

Talk battery is required whenever there are analog Voice cards present in the System, unless all of those are E&M ports and are used in TO (Transmission Only) mode or when Type 1 signaling is used. A -48 VDC power source is also required for use with the External Alarm Cards, OCU_DP card and to

provide sealing current for the BRI Card. The -48 VDC talk battery is provided by the Power supply.

36. What ringing voltage is on the Slimline?

Ringing Voltage 50 Vrms.

37. What is a Foreign Exchange-Station (FXSC) Coin Voice Card?

A Foreign Exchange-Station (FXSC) Coin Voice Card manages the flow of FXS voice traffic over the network. Each card encodes analog (voice, VF) signals to a digital bit stream at the local system for transmission over a T1 or E1 network. It also decodes the digital signals to analog at the remote system.

38. What kind of jack interface does the FXO Coin Card use?

The FXO Coin Card has a 50-pin Amphenol jack on its faceplate.

39. What is a FXO-C 2W*8-6 Coin Card?

The FXO-C 2W*8-6 Coin Card has eight wire ports, providing a 600-ohm terminating impedance. Card consists of backplane interface circuitry, serial EEPROM for card identification and adjustment parameters storage, metering pulse interface extension between Coin Box Office (CO) and coin phone on the CO side, and eight voice line interface circuits. Each line interface circuit consists of a codec, a hybrid circuit (2 to 4 wire converter), line feed circuitry and relays to control modes of operation.

40. What is a FXSC 2W*8-6 Coin Card?

The FXS-C 2W*8-6 Coin Card has six two wire ports and two wires, providing a 600-Ohm terminating impedance. Card consists of backplane interface circuitry, serial EEPROM for card identification and adjustment parameters storage, metering pulse interface extension between Coin Box Office (CO) and coin phone on the side of the coin phone, and six voice line interface circuits. Each line interface circuit consists of a codec, a hybrid circuit.

41. How many user cards (SRU, HSU, etc.) can be used in an IMACS 600, 800, or 900?

Assuming at least one WAN card in an IMACS 600, only 7 user cards can be used at the same time. An IMACS 800 or 900 can have 8 user cards. Caveat: Because there are two sets of data buses in the IMACS, AB and CD, with 64 timeslots on each set (AB actually reserves 2 timeslots, so user cards can only use 62), and because some models of user cards utilize the AB bus or the CD bus only, to maximize utilization of user card services, make sure that the IMACS is configured with a combination of user cards where some use the AB bus, and the balance use the CD bus.

42. What is a Low Bit Rate Voice Card?

The LBRV Card is a plug-in user card for the CPU server, which provides voice compression with echo cancellation.

43. What is the rate for the Low bit Rate Voice card?

The RATE field displays the compressed rate of the Cpipes. The values are 1x64 for 64Kbps pipes, 2x64 for 128Kbps pipes and 3x64 for 192 Kbps pipes. The default is 1x64.

44. How many ADPCM Server cards can be in use with Host 5.0?

All three ADPCM Server Cards can be used in Host 5.0. Note that 3.6 cannot support all three simultaneously. Host 3.6 only supports 2 ADPCM cards, and one redundant card.

45. What is the delay on the ADPCM card?

ADPCM - 2 frames or 250 microseconds.

46. What is the CPU switch time?

Switch from Primary CPU to redundant CPU is one reset time. One reset time is defined as 10 to 15 seconds. This is a worst case scenario, with all WANs assigned. Normal switch time is 5 to 7 seconds.

47. What is an E&M 2W*8 Card?

The E&M 2W*8 card has eight voice ports, each with 600-ohm terminating impedance.

48. What is a E&M 2713 Hz Card?

The E&M 2713 Hz Card provides digital loopback (both audio and signaling) when activated by a 2713 Hz tone of specified level and duration.