	ZIV USA Inc	Reference:
ZIV USA, Inc.		SEL Communications Processor Interface
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This document describes the procedures required to interface with SEL communications processors utilizing the ZIVercom software Version 1.90 and up (older versions can be used but require Patch 20 and up to incorporate the SEL2030 module). The procedures listed below are specific to the SEL 2030, but can also be applied to the SEL 2020.

To ensure proper operation the subsequent steps must be followed correctly for a remote connection (via modem) or a local connection (directly through a port of a SEL communications processor):

- ZIVercom (PC) communication settings
- ZIVercom (PC) SEL2030 module settings
- SEL 2030 communication settings
- ZIV relay communication settings

Additionally, an appendix includes information on:

- Communications cable selection
- RS232 port pinouts
- Modem settings

Remote Connection

ZIVercom Communications Settings:

- The Windows[™] based ZIVercom communications software must have the identical communications settings as the SEL 2030 port (master port) that is connected to the modem. To adjust the communications settings, select the Communications option from the Configuration menu.
- The **Port** setting should indicate the PC serial port that is connected the to the modem. The **Speed**, **Parity** and **Stop Bit** settings should match the settings of the SEL 2030 master port.
- Typically, the fields under **Modem Data** can be left in the **Auto** setting.



Co	mmunications Data
Port	СОМ 2 -
Speed	9600 -
Parity	None 🔹
Stop	1 Bit 🔹
IP Address	
i i	Modem Data
Modem	Auto 🔹
Dailing Mod	je Auto 🔹
Command	

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ZIVercom SEL2030 Settings:

• The ZIVercom communications software is equipped with a module that will establish a transparent connection with the appropriate selected port, as well as issue the **termination string** and **quit** commands when the session has ended.

ZI	VERCOM		
Quit	Configuration	Connection	
	Users Substatio	ns cations	
	SEL2030		

- To distinguish between a direct modem connection and a connection via a 2030, the SEL2030 menu needs to be opened and exited in order to set a switch in the ZIVercom software to interface with the 2030. The user needs to select the SEL2030 option each time a connection via an SEL 2030 is made. The settings will not need to be adjusted after they have been set the first time using the Add button.
- There are seven important settings in this menu
 - **Password Level 1:** Enter the Level 1 password for your device.
 - **Password Level 2:** Enter the Level 2 password for your device.
 - **Slave Port:** Select the port that the ZIV relay is connected to.
 - **Speed:** Select the speed of the slave port to match the speed of the ZIV serial port.

	SEL2030 Data	
Passwor Passwor	d Level 1 OTTER	
Slave Po	Terstring Master Port	
	Substation Data	Delete
Name Phone	CHICAGO - 2030 55555551212	<u><u>R</u>ew</u>

- **Terstring Master Port:** Enter the text string that terminates the transparent connection to the slave port
- Name: Enter the name of the substation / connection for database purposes.
- **Phone:** Enter the phone number of the substation to be dialed.

SEL 2030 Communication Settings:

An SEL 2030 can communicate with up to 16 different IEDs using EIA-232 serial communication. A PC communicates to the 2030 via HyperTerminal (or similar terminal emulator program) to perform programming of each port.

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Please refer to the SEL 2030 manual for procedures and ASCII commands to configure and activate ports for communication.

The SEL 2030 rear port configuration options are listed below. The Slave Port settings should correspond to the communications settings of the ZIV relay as well as the **Slave Port** settings in the **SEL2030** module of the ZIVercom software. The items in **bold** indicate the proper settings used for this example.

Slave Port:

3 (arbitrary) O N N
Α
" User Defined "
4800 (arbitrary)
8 STOPBIT = 1 PARITY = N
N XON_XOFF= N
User Defined

Master Port:

PORT:	10 (arbitrary)
DEVICE =	Μ
PROTOCOL=	S
FAST_OP =	Ν
PORTID =	" User Defined "
MODEM =	Y
MSTR =	" User Defined "
CD_CTS =	Ν
BAUD =	9600 (arbitrary)
DATABIT =	8 STOPBIT = 1 PARITY = N
XON_XOFF=	Ν
TIMEOUT =	User Defined ECHO = Y
AUTO_HELP=	Ν
TERTIME1=	User Defined
TERSTRING=	" User Defined " (SEL default is "\004")
TERTIME2=	OFF

Note: The setting TERSTRING refers to the termination string that is required to end the transparent mode of communications and is used in the SEL2030 module in the ZIVercom software.

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ZIV Relay Communication Settings:

The rear communications port settings of the ZIV relay must match the communications settings of the SEL 2030 slave port. The front port of a ZIV relay can also be used, but the speed is not adjustable. The default communication settings are 4800:1:Even. The parity settings of the front port can be adjusted in the **Communications** menu (example note shown).

- Press any key on the keypad to display the main menu.
- Select option 0 **Configuration** to enter the Configuration menu.
- 0 CONFIGURATION
- 1 Operation
- 2 Active Group

1 - Operation Enable

2 - Transducer Scale 3 - Configure Inputs

4 - Configure Outputs 5 - COMMUNICATIONS 6 - Date and Time 7 - Contrast

- 3 Change Settings
- 4 Information

0 - Password

• Select option 5 – **Communications** to enter the Communications menu.

- Option 0 Terminal Address is only used when a relay is incorporated into an integrated system. This setting can be ignored for other applications.
- Selecting option 1 Baud Rate will open the Baud Rate setting screen. Ensure that this setting corresponds to the same speed of the SEL 2030 slave port.
- Selecting option 2 Stop Bits will open the Stop Bits setting screen. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

- 0- TERMINAL ADDRESS
 - 1- Baud Rate
- 2- Stop Bits
- 3- Parity

BAUD RATE ACTUAL: 9600 NEW: @@@@ Range (300 to 19200)

STOP BITS ACTUAL: 1 NEW: @ Range (1 or 2)

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Selecting option 3 – Parity will open the Parity setting screen. 0 represents NO Parity and 1 represents Even Parity. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

	PARITY	
ACTUAL:	0	
NEW :	@	
Ra	inge (0 or 1)	

- Press the **ESC** key until the **Confirm Changes** prompt appears. Press **F1** to accept the changes or **F4** to cancel the changes.
- Press the ESC key until the default screen appears. The relay is now configured for remote communications via the rear port.

CONFIRM CHANGES			
YES			NO
F1	F2	F3	F4

Connection:

Once all of the settings have been completed, a remote connection via the 2030 can be made.

- Step 1: Initiate the ZIVercom program
- Step 2: Log on using your username and password



Step 3: Select the **SEL2030** option from the **Configuration Menu** to prepare the software to interface with the 2030. Ensure that the settings are correct and click the **Exit** button.

	SEL2030 Data	
Password L Password L Slave Port YOUR	evel 1 OTTER evel 2 TAIL PORT 10 Y Speed 4800 Y Terstring Master Port TERMINATION STRING	
	Substation Data	Delete <u>N</u> ew
Name [CHICAGO - 2030	<u><u> </u><u> </u> <u> </u>ancel</u>

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Step 4: Select **Remote** from the **Connection** menu



- Step 5: Verify and adjust (if necessary) the **Name**, **Phone** number and the **Speed** of the substation to connect to.
- Step 6: Click the **Telephone** Icon to initiate the call.

	Substation Data	
Name	CHICAGO	
Phone	18475555555	
REMAR	(S	
		*
-		4
	Communications	
0	0000	
Speed	3000	
Comm	ind	

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Step 7: The CONNECTING screen will appear. The Initializing modem message will appear and indicates that ZIVercom is temporarily adjusting the settings of the modem to work correctly with the application. The Waiting to Connect message will then appear indicating that the local modem is attempting to establish communications with the remote modem.

Substation Data	
Name CHICAGO	
Phot CONNECTING	
REMA	
Initializing modem	Add
	Dele
Spe	Net
Command	
	Cano
Command	

Step 8: The **SETTING SEL2030** prompt will appear after the ZIVercom recognizes the SEL2030 prompt and is ready to send the configuration information.

> After clicking OK, the ZIVercom will establish Level 2 access with the 2030 and will prepare the slave port for transparent communication to enable the ZIVercom to communicate with the ZIV relay.

If the program skips step 8,

ensure that you have completed step 3 above.

	Substation Data	
Name	CHICAGO	
Ph ZIVE	RCOM-REMOTE	×
REN	SETTING SEL2030	
	Dk	
	Communications	
1		
Speed	9600	-
Comm	and	-1
-		

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Step 9: After the transparent communications channel has been established, the ZIVercom will prompt the user to click **OK** to establish the remote relay communication.



- Step 10: The RELAY STATUS screen will appear. You may now use the ZIVercom program to:
 - Review and edit settings
 - Collect event records
 - Collect oscillographs
 - Collect fault reports
 - Etc.

Substation CHICA	GO	Model 8BCDG	Number
TRANSFORME	R RATIO	METERING	Bay CAP1
CT: 40 I	GND CT: 40	IA 0.00 A	Line O'HARE
VT: 600 V	/Unb VT: 166	IB 0.00 A	Date 02/05/2004
BRK A	UTO	IC 0.00 A	Time 10.54:54
MEASURING	ELEMENTS	IG 0.00 A	
PICKUP	ACTIVE	V bus 71.88 kV	Date 02/05/2004
OIDC A OTOC A	OIDC A OTOC A	Q 0.00 Mvar	1 ime 10:54:57
		V unbal 1.23 V	
OIDV OTOV	OV OTOV	HISTORY	
● IUV ● VUnb2 ● VUnb1● VUnb3	IUV VUnb2 VUnb1 VUnb3	🔴 EVENT 🔮 FAULT 🥌 I 🧯	V 010CC 0 TOCC
INPUTS AND		ALARMS	
1234 IN 00000	5678	E2PROM ADC ERR CLOCK BATTERY	OR OR OV OR OV OV OV OV OV OV OV OV OV OV

To terminate the connection, **Exit** out of the RELAY STATUS screen and click the **Cancel** button on the REMOTE CONNECTION screen.



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LOCAL CONNECTION

ZIVercom Communication Settings:

- The Windows[™] based ZIVercom communications software must have the identical communications settings as the SEL 2030 port (master port) that is connected to the PC. To adjust the communications settings, select the Communications option from the Configuration menu.
- The Port setting should indicate the PC serial port that is connected the to the modem. The Speed, Parity and Stop Bit settings should match the settings of the SEL 2030 master port.
- Typically, the fields under **Modem Data** can be left in the **Auto** setting.

SEL 2030 Communication Settings:

An SEL 2030 can communicate with up to 16 different IEDs using EIA-232 serial communication. A PC communicates to the 2030 via HyperTerminal to perform programming of each port.

Please refer to the SEL 2030 manual for procedures and ASCII commands to configure and activate ports for communication.



Co	mmunications Data
Port	COM 2 •
Speed	9600 -
Parity	None -
Stop	1 Bit
IP Address	
	Modem Data
Modem	Auto 🔹
Dailing Mo	de Auto 🔹
Command	

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The SEL 2030 rear port configuration options are listed below. The Slave Port settings should correspond to the communications settings of the ZIV relay as well as the **Slave Port** settings in the **SEL2030** module of the ZIVercom software. The items in **bold** indicate the proper settings used for this example.

Slave Port:

PORT:	3 (arbitrary)
DEVICE =	0
MODEM =	Ν
AUTO_BAUD=	Ν
PROTOCOL=	Α
PORTID =	" User Defined "
BAUD =	4800
DATABIT =	8 STOPBIT = 1 PARITY = N
RTS_CTS =	N XON_XOFF= N
TIMEOUT =	User Defined

Master Port:

PORT:	10 (arbitrary)
DEVICE =	Μ
PROTOCOL=	S
FAST_OP =	Ν
PORTID =	" User Defined "
MODEM =	Ν
MSTR =	" User Defined "
CD_CTS =	Ν
BAUD =	9600 (arbitrary)
DATABIT =	8 STOPBIT = 1 PARITY = N
XON_XOFF=	Ν
TIMEOUT =	User Defined ECHO = Y
AUTO_HELP=	Ν
TERTIME1=	User Defined
TERSTRING=	" User Defined " (SEL default is "\004")
TERTIME2=	OFF

Note: The setting TERSTRING refers to the termination string that is required to end the transparent mode of communications and is used in the SEL2030 module in the ZIVercom software.

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ZIV Relay Communication Settings:

The rear communications port settings of the ZIV relay must match the communications settings of the SEL 2030 slave port. The front port of a ZIV relay can also be used, but the speed is not adjustable. The default communication settings are 4800:1:Even. The parity settings of the front port can be adjusted in the **Communications** menu (example not shown).

- Press any key on the keypad to display the main menu.
- Select option 0 **Configuration** to enter the Configuration menu.
- 0 CONFIGURATION
- 1 Operation
- 2 Active Group

1 - Operation Enable

2 - Transducer Scale 3 - Configure Inputs

4 - Configure Outputs 5 - COMMUNICATIONS 6 - Date and Time 7 - Contrast

- 3 Change Settings
- 4 Information

0 - Password

 Select option 5 – Communications to enter the Communications menu.

- Option 0 Terminal Address is only used when a relay is incorporated into an integrated system. This setting can be ignored for other applications.
- Selecting option 1 Baud Rate will open the Baud Rate setting screen. Ensure that this setting corresponds to the same speed of the SEL 2030 slave port.
- Selecting option 2 Stop Bits will open the Stop Bits setting screen. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

- 0- TERMINAL ADDRESS
- 1- Baud Rate
- 2- Stop Bits
- 3- Parity

BAUD RATE ACTUAL: 9600 NEW: @@@@ Range (300 to 19200)

STOP BITS ACTUAL: 1 NEW: @ Range (1 or 2)

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Selecting option 3 – Parity will open the Parity setting screen. 0 represents NO Parity and 1 represents Even Parity. Ensure that this setting corresponds to the same value of the SEL 2030 slave port.

PARITY				
ACTUAL:	0			
NEW:	@			
Ra	ange (0 d	or 1)		

- Press the ESC key until the Confirm Changes prompt appears. Press F1 to accept the changes or F4 to cancel the changes.
- Press the **ESC** key until the default screen appears. The relay is now configured for remote communications via the rear port.

CONFIRM CHANGES			
YES			NO
F1	F2	F3	F4

Connection:

Once all of the settings have been completed, a local connection via the 2030 can be made.

- Step 1: Connect via Hyper Terminal (or similar terminal emulator program) to the SEL 2030 via the master port. Ensure that the communications properties of the Hyper Terminal connection match the master port of the 2030 (see SEL 2030 manual for detailed instructions).
- Step 2: Perform the appropriate steps to establish a transparent connection to the slave port of the 2030 (see SEL 2030 manual for detailed instructions).
- Step 3: Suspend the communications between Hyper Terminal and the master port of the 2030 by disconnecting. This will leave the transparent connection open while freeing up the COM port on the PC for the ZIVercom software program.
- Step 4: Select Local from the Connection menu

ZIVERCOM		
Quit Configuration	Connection	
	Local	1
	Remote	1
	Emulation >	

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Step 5: The LOCAL CONNECTION screen prompts the user to enter a **Substation** name. This is an optional step, but is recommended as it aids in event and substation data tracking and organization. Click the **OK** button once a substation name has been entered.

Substat	tion: Chicago
	Equipment # 0
	OK Cancel

- Step 6: The RELAY STATUS screen will appear. You may now use the ZIVercom program to:
 - Review and edit settings
 - Collect event records
 - Collect oscillographs
 - Collect fault reports
 - Etc.

Substation CHICAGO	M	odel 8BCDG	Number
TRANSFORMER RATIO	M	IETERING	Bay CAP1
CT: 40 GND CT:	40 IA	0.00 A	Line O'HARE
VT: 600 VUnb VT:	166 IB	0.00 A	Date 02/05/2004
BRK AUTO	IC	0.00 A	Time 10.54:54
MEASURING ELEMENT	S IG	0.00 A	
PICKUP ACTIV	E V bus	71.88 kV	Date 02/05/2004
010C A 0TOC A 010C A 0	TOC A Q	0.00 Myar	Time 10:54:57
	TOCC Vunbal	1.23 V	
	TOV HI	STORY	
IUV ● VUnb2 ● IUV ● ● VUnb1● VUnb3 ● VUnb1●	VUnb2 VUnb3	FAULT 🥘I 🥮V	
INPUTS AND OUTPUTS		LARMS	
123456 IN 000000000000000000000000000000000000	7 8 8 8 8 9 CLOCK B	ADC ERROR	IUV G TOV GIUV G VUnb 2 G VUnb 1 G VUnb 2

Summary:

Relay communications via the SEL 2030 can be achieved provided that the proper cable selection has been made and that the appropriate communications settings have been applied to the PC, the SEL 2030 and ZIV relay. For additional assistance, please contact the factory.



ZIV USA, Inc.

Reference:

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APPENDIX:

Communications Cable Selection:

The SEL 2030 instruction manual provides a table of appropriate cables for various types of connections. For a standard RS-232 connection, a male-to-male DB-9 cable is required between the serial ports of an SEL 2030 and a ZIV relay. The ZIV device requires a null-modem (pins 2 and 3 crossed) type cable for proper connection. Please consult the SEL 2030 manual for specific cable part numbers to meet various requirements

REMOTE CONNECTION

PC – Local Modem	Serial ("Straight") Cable
Remote Modem – SEL Master Port	Serial ("Straight") Cable
SEL Slave Port – ZIV Relay	Null Modem Cable (pins 2 & 3 crossed)
LOCAL CONNECTION	
PC – SEL Master Port	Null Modem Cable (pins 2 & 3 crossed)

SEL Slave Port – ZIV Relay Null Modem Cable (pins 2 & 3 crossed)

Pinouts:

The ZIV RS232, DB9 communications ports have the following pinout.

PIN 2: TXD

PIN 3: RXD





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Modem Settings:

The modem settings should not require adjustment as the ZIVercom software temporarily adjusts the local modem settings to work properly. However, it is important to note that the remote modem must be programmed at the desired connection speed and should match the master port communications parameters of the SEL 2030.

ZIV recommends the following modem settings for US Robotics type modems utilizing a baud rate of 4800 in this example.

LOCAL MODEM

U.S. Robotics 56K FAX EXT Settings...

B0 E0 F1 L2 M1 Q0 V0 X1 Y0 SPEED=4800 PARITY=N WORDLEN=8 DIAL=TONE OFF LINE CID=0

&A0 &B0 &C1 &D2 &H0 &I0 &K0 &M0 &N0 &P0 &R1 &S0 &T5 &U0 &Y1

S00=001 S01=000 S02=043 S03=013 S04=010 S05=008 S06=004 S07=060 S08=002 S09=006 S10=014 S11=072 S12=050 S13=000 S15=000 S16=000 S18=000 S19=000 S21=010 S22=017 S23=019 S25=005 S27=001 S28=008 S29=020 S30=000 S31=128 S32=002 S33=000 S34=000 S35=000 S36=014 S38=000 S39=012 S40=000 S41=004 S42=000 LAST DIALLED #:

REMOTE MODEM

U.S. Robotics 56K FAX EXT Settings...

B0 E1 F1 L2 M1 Q0 V1 X4 Y0 SPEED=4800 PARITY=N WORDLEN=8 DIAL=TONE OFF LINE CID=0

&A0 &B0 &C0 &D0 &H0 &I0 &K0 &M0 &N0 &P0 &R1 &S0 &T5 &U0 &Y1

S00=002 S01=000 S02=043 S03=013 S04=010 S05=008 S06=004 S07=060 S08=002 S09=006 S10=014 S11=072 S12=050 S13=000 S15=000 S16=000 S18=000 S19=000 S21=010 S22=017 S23=019 S25=005 S27=001 S28=008 S29=020 S30=000 S31=128 S32=002 S33=000 S34=000 S35=000 S36=014 S38=000 S39=012 S40=000 S41=004 S42=000