

# ESI

User Guide

# **ESI USER GUIDE**

### Introduction

The IM ESI is a potential-free contacts monitoring- and relay actuator system, to be used with IM TELECONTROL. The full link to the UPS is still maintained. At the same time the ESI may act as serial interface, converting from RS232 (PC-side) to RS422 or RS485 (UPS-side).



A single ESI may read the status of up to 6 independent potential free contacts and may control up to 2 independent relays. The communication to the UPS is serial according RS485 (for 090P and 095 UPS series) or RS422 (for 061, 065 and 090S UPS series). The communication toward IM Telecontrol is serial and uses the same standard as for the UPS or alternatively RS232 (switch-selectable).

It is possible to install up to 4 ESI on a single IM Telecontrol channel, to expand the number of potential free contacts to the needed quantity. Discrimination is done by an **address**, installable by switches.



The ESI output may be connected to a PC directly or through an Interface Converter and/or a Modem.

This latter may **not** be used for "parallel" UPS units.

The Interface Converter, if needed, may be delivered by IM (Model SSV-3).

The ESI behaves transparently when IM Telecontrol is communicating with the UPS.

# Connectors J1 ... J3 (serial interfaces)

The ESI is equipped with 3 subminiature delta connectors **J1** ... **J3**. The UPS should be connected on the J1 connector, on which both the RS422- and the RS485-signals are defined. The J2 connector is to be used when the ESI output goes to a Modem or directly to the PC. It provides the signals accordingly the RS232 standard. By this way the ESI also act as interface converter (RS422/485  $\leftarrow \rightarrow$  RS232). The J3 connector goes toward the IM Telecontrol and carries the signals using the same standard like on the J1 connector, i.e. RS422 and RS485. Using this connector you implicitly assume to install an interface converter between the ESI and IM Telecontrol (or a Modem). This may be useful when you have to carry the signals over longer distances.

Pins who are not specified should not be used.

### J1 connector, RS422 standard (switch SW1.4 = off)

J1-Pin	In/Out	Name	$\rightarrow$	UPS	Pin (6525/J18)
3	In	RX+		TX+	3
4	In	RX-		TX-	4
6	-	GND		GND	6
7	Out	TX+		RX+	7
8	Out	TX-		RX-	8

Link to the UPS. 15 pin female subminiature delta connector.

### J1 connector, RS485 standard (switch SW1.4 = on)

Link to the UPS. 15 pin female subminiature delta connector.

J1-Pin	In/Out	Name	$\rightarrow$	UPS	Pin (7045/J88)
9	In/Out	RTX-		TX-	9
10	In/Out	RTX+		TX+	10
13	-	GND		GND	13

### J2 connector, RS232 standard (switch SW1.5 = on)

Link to IM Telecontrol. 25 pin female sub miniature delta connector. The pins are defined as DSE (data set equipment), thus like a Modem. A PC may be connected using a standard 1:1 cable meanwhile a Modem may be connected to the ESI by reversing some signals.

J2-Pin Modem	In/Out	Name $\rightarrow$	PC 25 pin	PC 9 pin	
2 (TD)	In	RD	2	3 3	
(12) 3 (RD)	Out	TD	3	2 2	
4 (CTS)	In	RTS	4	75	
(013) 5 (PTS)	Out	CTS	5	8 4	
6 (NTB)	Out	DSR	6	6 20	
(DTR) 7	common	GND	7	57	

### <u>J3 connector, RS422 standard (switches SW1.4 = off, SW1.5 = off)</u>

J3-Pin	In/Out	Name	$\rightarrow$	SSV-3 Interf. conv. <sup>1</sup>	Pin
3	Out	TX+		RD-	10
4	Out	TX-		RD+	9
6	-	GND		GND	13
7	In	RX+		TD-	14
8	In	RX-		TD+	15

Link to IM Telecontrol. 15 pin male subminiature delta connector.

### <u>J3 connector, RS485 standard (switches SW1.4 =on, SW1.5 = off)</u>

Link to IM Telecontrol. 15 pin male subminiature delta connector.

J3-Pin	In/Out	Name $\rightarrow$	SSV-3 Interf. conv. <sup>2</sup>	Pin
9	In/Out	RTX-	RD+	9
10	In/Out	RTX+	RD-	10
13	-	GND	GND	13
14	In/Out	RTX+ (≡ Pin 10)	TD-	14
15	In/Out	RTX- (≡ Pin 9)	TD+	15

<sup>&</sup>lt;sup>1</sup> Delivered by IM. This device defines signals with reverse polarity.

<sup>&</sup>lt;sup>2</sup> Delivered by IM. This device defines signals with reverse polarity.

# Potential-free contacts

Four terminal blocks named **X1** ... **X4** may be used to connect up to 6 potential-free contacts (Input) and up to 2 relays (Output). See the technical specification for maximum ratings.

On any Input and Output it is possible select the appropriate polarity.

### <u>Inputs</u>

Inputs are sensed by an optocoupling device. The basic schematic is as follows:



You generate an active state when the diode became conductive.

- 1. If a **NO**-type contact has to be sensed, connect that contact to the terminals "b" and "c".
- 2. If a **NC**-type contact has to be sensed, connect that contact to the terminals "a" and "b", **and** connect "b"-"c" together.

Normally the state of a potential free contact, reported to IM Telecontrol, reflects exactly the condition on the terminals. This is indicated as **level detection**. Refers to the Chapter "Special Operating Modes" to have the ESI working in edge-detection-mode.

### <u>Outputs</u>

Outputs are realised by means of relays, using the basic scheme as follows:



If you need a **NO**-type contact, use terminals "d" and "f". Otherwise if you need a **NC**-type contact, use terminals "e" and "f".

Assignment for INPUT-Terminals
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Terminal	Name	type	Terminal	Name	type
X1-1	Contact I1	-a	X2-4	Contact I4	-a
X1-2		-b	X2-5		-b
X1-3		-C	X2-6		-C
X1-4	Contact I2	-a	X3-1	Contact I5	-a
X1-5		-b	X3-2		-b
X1-6		-C	X3-3		-C
X2-1	Contact I3	-a	X3-4	Contact I6	-a
X2-2		-b	X3-5		-b
X2-3		-C	X3-6		-C

### Assignment for OUTPUT-Terminals

Terminal	Name	type	Terminal	Name	type
X4-1	Relay R1	-е	X4-4	Relay R2	-е
X4-2		-d	X4-5		-d
X4-3		-f	X4-6		-f

# Switches SW1

Normally all switches should be defined prior to power-up the ESI. This is particularly true for all switches indicated by  $\otimes$ .

Switch	Name	Description (TRUE when switch is on)
1	addr0	Low bit of address. Off = $0$ .
2	addr1	High bit of address. Off = 0.
3	edge	Edge detection mode. Works on <b>all</b> input contacts simultaneously. See "special operating modes".
4 ⊗	ups95	On when a UPS series 095/090P is connected to J1.
5	rs232	On when ESI-output uses standard RS232 (on J2).
6	alrm-H	Automatic alarm via Modem for Inputs I4I6. See "special operating modes".
7	alrm-L	Automatic alarm via Modem for Inputs I1I3. See "special operating modes".
8	reset	When On, the Microprocessor is in the reset-state.

# Connection of two or more ESI

If you need to expand the number of relays or potential-free contacts over the limit of a single ESI you may chain up to 4 devices as illustrated in the introduction. Proceed as follows:

1. Set-up the switch SW1.4, **identically** for all ESI. If your UPS belongs to the series 090P/095 ("parallel" units) the switch must be ON.

2. Interconnect all ESI by feeding the Output J3 to the Input J1.

UPS series 090P/095 (SW1.4=on)			Other UPS series (SW1.4=off)			
J3	$\rightarrow$	J1	J3	$\rightarrow$	J1	
9		9	3		3	
10		10	4		4	
13		13	6		6	
			7		7	
			8		8	

3. Define a unique address for every ESI, starting from 00. The address may be installed using SW1.1 and SW1.2. It is not significant which ESI correspond to address 00. The sole limitation is to use **consecutive addresses**.

# **Special Operating Modes**

### Edge- detection (SW1.3 = on)

Normally, when the state of a potential-free contact is requested, the true status is returned, i.e. the actual position of the contact. This operating mode may be defined with **level detection**. In some situations you need to monitor not the true position but want to see if the contact has closed between status requests. Otherwise said you are interested to detect edges. This mode of operation will be called **edge detection**.

It is possible to instruct the ESI to operate in edge-detection-mode. Reliable operation is guaranteed if the contact remains closed for  $\geq$  50 ms.

When programmed so, edge detection acts on all contacts.

### Automatic Alarm via Modem (SW1.6 and/or SW1.7 = on)

When operating via Modem it is possible to instruct the ESI to automatically dial a phone number when a contact is closed for more than 2 minutes. If during the next 5 minutes after dialling the IM Telecontrol does not have requested the status of the contacts, the same phone-number is dialled again.

The Modem has to satisfy some conditions for this operating mode to be effective:

- Capability to store phone-numbers. The user has to store the wanted alarm number by manually programming the Modem (on most devices the command AT&Z= has to be supplied).
- □ Capability of dialling stored phone-numbers with the */n*-command.

This feature may be enabled on a group of 3 contacts at a time: on I1...I3 (controlled by SW1.7) and on I4...I6 (controlled by SW1.6).

NOTES: - The ESI will not initialise the Modem. This is normally done by the UPS.

- Be aware of activating the edge-detection mode and the auto-alarming mode simultaneously: a short pulse on a contact will suffice to start the alarming procedure.

# Programmation of IM Telecontrol

Following procedure has to be followed to instruct IM Telecontrol to recognise all connected ESI:

Create a text-file named **\*.AUX**. This file will hold the ESI specifications. The "\*" has to be replaced by a name which uniquely identify the UPS. For 065/090S UPS-units, the name must match with the one specified during configuration. For 090P/095 UPS-units the name is not significant. The File must have following format:

- every line who has an ";"-char in the first column is ignored (comment-line)
- the **first valid line** is a global specification and should be:

### \*Nmmmm

- where \* identify the command line (required)
  - N specify how many ESI [0..4] are installed in a single communication channel.
  - m specify the detection mode, for every ESI. You must specify
    - "E "for edge-detection or
    - "L" for level-detection
- The remaining lines specify the Text who has to be displayed on the screen, for every contact:

### Nc{=|-}text; comment

where N is the ESI-number [1..4]

- c designate the contact-number [1..7] or the header [0]. Remember: contacts numbered (1,2) are the relaysoutput meanwhile contacts numbered (3..8) are the inputs.
- has to be specified as separator if you want to be alarmed when a contact closes.
- has to be specified as separator if you don't want to be alarmed when a contact closes.
- text is the contact-descriptor which will be displayed on the screen.
- ; separates the comment-part which is optionally and will be ignored.

### Example:

*3ELL	Global specification: 3 ESI has to be controlled. The first one (whose installed address is 0) is handled in Edge-detection-mode. The remaining two operates in Level-detection-mode.
10=ROOM1	Header for the first ESI. The text "ROOM1" will be displayed in the header of the displayed contacts.
23=FIRE	ESI #2, contact #3 will be displayed with the identification "FIRE". When the contact will be closed, the alarm (buzzer) will sound.

34-DOOR ESI #3, contact #4. The alarm (buzzer) will not be activated when the contact is closed.

### NOTES:

- Use the sample file **ESI.SPL** as layout for your own **\*.AUX** file.

## **Quick Reference**

If you are familiar with the operating-mode of the ESI and do not want to read the whole guide, follows the instructions in the following to initialise and install the ESI. It is assumed you use a single device.

- 1. Prepare IM Telecontrol to operate with the ESI.
- 2. Switch all SW1-switches to the off-position (down).
- 3. Check for the UPS-type that will be connected. For UPS series 090P and 095 set SW1.4=ON. This switch should only be modified when the ESI is powered off; when not, a reset of the microprocessor must be performed (SW1.8=ON/OFF).
- 4. If the ESI Output is connected directly to the PC (IM Telecontrol) or to a Modem (065/090S UPS series only), set SW1.5=ON.
- 5. Select the appropriate connection-cable for J1 (toward the UPS) and J2/J3 (toward IM Telecontrol). Refer to the Chapter "**Connectors**".
- 6. Connect the potential-free contacts to be monitored and the relays to be commanded on the terminal blocks X1 ... X4. Refer to the Chapter "**Potential-free contacts**".
- 6. Power-on the ESI, if not already on.

# **Technical specifications**

### link to the UPS

- □ Serial channel accordingly RS422 or RS485 (switch selectable).
  - □ Connectable to UPS series 061/065/090S and 090P/095.
  - 3 wires shielded cable, max. 300m (090P/095) or
    5 wires shielded cable, max. 300m (061/065/090S).

### link to IM Telecontrol

- □ Serial channel accordingly RS422, RS485 or RS232 (switch selectable).
  - The same cable previously used to connect the UPS may be plugged in the ESI.
  - □ Max. 300m using RS422 and RS485.
  - □ Max. 15m using RS232.

### Potential-free contacts (Inputs)

- $\Box$  6 inputs.
  - Delarity NO or NC is user-selectable for every input.
  - □ Min. 24V DC/20 mA switching capability needed.

### Relays (outputs)

- □ 2 outputs, single switching contact.
- □ Polarity NO or NC is user-selectable for each output.
- □ max. 60V/2A/28W for DC **or** max. 220V/1.25A/60VA for AC.

### Power Supply

230VAC ± 10% fuse: 1.0 AT.