

# **Ipari Elektronika Project**

**Planning and Manufacturing**

**Ltd.**



EDI 2011 control unit  
(JAZZ - UNITRONICS)

Operating manual

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## 1. Pre-face

The control unit controls the function of the EDI ion exchange unit of the system and displays the detected failure events.

The control unit can be switch on using the main switch of the front panel. After start-up the unit always changes „AUTO” mode if the keyboard is not locked and it always keeps its previous state (*ENABLED*, or *DISABLED*).

We can found some lamps on the front. These indicates the unit present state: OP. Ready (white), Operating (green) and Fault (red) lamps.

The operation mode of the unit can be chosen (*MANUAL / AUTO*) using the „OPERATION MODE” button, if the keyboard is not locked.

The „ OPERATION STATE” button enables to change the unit state (*ENABLED*, or *DISABLED*) if the keyboard is not locked.

In „AUTO.” mode the unit automatically controls the voltage in function of the current value changes.

The voltage control buttons are active only in „MANUAL.” mode or „*DISABLED*” state. If the keyboard is not locked. In these cases the current limitation is not activated.

On the display we can find the actual state of the unit, and also the failure messages are displayed here.

## 2. Buttons and their function



i button

Menu screen / System menu to set proper time



ENTER

Error acknowledgement / Parameter entering



0 button

Operation mode – state button / keyboard lock on/off



Left arrow

Decreasing voltage



Right arrow

Increasing voltage



Up arrow

Screen paging up



Down arrow

Screen paging down

**„MENU” button (*i button*)**



Using this button we can reach the “MENU” screen where the additional available instructions are displayed. By following these instructions we can query all the available parameter of the system and also we can modify them.

**Caution!**



3sec

By pressing the “MENU” for a longer period (3 sec) we can enter the System menu where possible to set the proper time and date besides others.

1. When entering the menu first the INPUTS / OUTPUTS menu is displayed.
2. Then by pressing the left arrow we step to the SYSTEM menu
3. After selection of the SYSTEM menu item by pressing the ENTER button the TIME & DATE menu item will be displayed.
4. When the TIME & DATE menu item is selected and we press the ENTER then the TIME menu is displayed.
5. When the TIME menu item is selected and we press the ENTER again then the proper time setting is possible by using the numerical keys. When we finished the modification we have to press the ENTER button to enter the set value.
6. When the TIME menu item is selected, but we want to set the date instead of the time then we have to press the left or the right arrow. Then the abbreviation of the day (*i.e. Mon*) and the Day/Month/Year is displayed. The setting process of a new value is the same as written in the point 5.
7. When the values are set and entered, then we have to press the (i) button until going back to the “MENU” screen.

- **„OPERATION MODE” button (0 button)**



Using the operation mode button on the operation mode screen we can define the way of functioning for the unit – if the keyboard is not locked.

If the actual display is the operation mode screen, then by pressing the button we can change the mode of the operation (*MANUAL, or AUTO*)

EDI: AUTO WORKING	
ALTERATIONS	<0>

Actual operation mode

Change by pressing the 0 button

I.e. if the present operating mode is *MANUAL*, then by pressing the *OPERATION MODE* button the unit changes to *AUTO* operation mode.

- **„OPERATION STATE” button (0 button)**



On the operation mode screen this button can be used for unit switching to *ENABLED*, or *DISABLED* – if the keyboard lock is not active.

If the actually the operation state screen is displayed, then we can change the operation state (*ENABLED, or DISABLED*) by pressing the the button.

EDI: OP. ENABLED	
ALTERATIONS	<0>

Actual operation state

Change by pressing the 0 button

I.e. if the unit is switched *DISABLED*, then by pressing the *OPERATION STATE* button the unit switches *ENABLED*.

- „VOLTAGE ADJUSTMENT” buttons (*Left-Right arrows*)



We can change the unit voltage parameter using this button only in MANUAL operation mode or in DISABLED operation state – if the keyboard is not locked.

We can decrease the voltage by pressing the Left arrow and increase it using the right arrow.

- „ACKNOWLEDGEMENT” button,  
for failure message acknowledgement (*Enter button*)



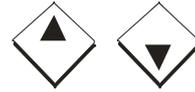
In case of any detected failure the description of the failure is displayed on the screen of not accepted failure messages. Additionally the unit is equipped with a signalling output which is activated if there’s any not acknowledged failure. Using this button we can accept the displayed message and reset the signal output.

U.ACK:	105V/3.1A
CURRENT HIGH	

The V/A is flashing only for information acknowledge by pressing the ENTER button

I.e. if a high voltage failure is detected by the unit then the signal outlet will be activated. By pressing the “ACKNOWLEDGE” button the signal outlet will be reset.

- „**SCREEN PAGING**” buttons (*Up-Down arrows*)



If the process screen is displayed then we can change the screen by using the “SCREEN PAGING” buttons (to query different data).

By pressing the Up arrow the actual input data will be displayed. Using the Down arrow we can see the operation mode, operation state will be displayed and finally the output data. To step back to the process screen we have to use again the arrow buttons for opposite direction paging.

If the presently active failure list screen is displayed and more failures are active at the moment then we can display each active failure messages using the “SCREEN PAGING” buttons.

We can also each programmable parameters using the “SCREEN PAGING” buttons on the parameters screen. Before paging we have to accept each parameter by pressing the “ENTER” button – in other case the paging won’t function.

### 3. Displayed data and their description

- **MENU screen**

PROCESSES	<1>
DEFECTS	<2>

To display voltage data and unit state

To display the active failures

KEY LOCK	<3>
PARAMETERS	<4>

To unlock use this password: 1230

To display parameters use this pass: 4560

CALIBRATION	<5>
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For calibration use this password: 7890

- **Process screen**



On this screen the unit voltage and current data and other operating states are displayed.

Using the „SCREEN PAGING” buttons we can display the following information:

ACTIVE INPUTS:						
I0	I1	I2	I3	I5	I7	

Display of active inputs

VOLT:	105/110V
CURR:	2,6/3.0A

Actual / Set voltage data

Actual / Set current data

EDI: AUTO WORKING	
ALTERATIONS	<0>

Present operation mode displaying

To change use the 0 button!

EDI: OP. ENABLED	
ALTERATIONS	<0>

Present operation state displaying

To switch on/off use the 0 button!

ACT. OUTPUTS:	O04
12 14	19

The number of voltage controller output

Indication of active outputs

- **Keyboard lock screen**



Here you can opened/closed the keyboard.

The actual state of the keyboard lock can be changed using the <0> button (*OPENED, or CLOSED*)



**The controller unit buttons don't function if the keyboard lock is on (CLOSED).**

- **Parameter screen**



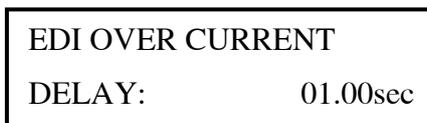
We can modify the unit running parameters on this screen.

Using the „SCREEN PAGING” buttons we can display each parameters in order. Before paging we have to accept each parameter by pressing the “ENTER” button – in other case the paging won't function.



Current limit value

Enter the new value in the given format!



Delay of over current detection

Enter the new value in the given format!



Delay of over current resetting

Enter the new value in the given format!

EDI START OFF  
DELAY: 03.00sec

Start-up and shutdown input delay  
Enter the new value in the given format!

EDI RECIRC STOP  
DELAY: 00:10m:s

Recirc input shutdown delay  
Enter the new value in the given format!

EDI OVER CONDUCT.  
DELAY: 01:00m:s

High conductivity signal delay.  
Enter the new value in the given format!

**CAUTION!**



We can use the *ENTER* button to reset all programmable parameters to its default value (*i.e. if unauthorized person entered wrong parameters to the unit*)

When pressing this button for longer (*2sec*) the „RESET TO DEFAULT VALUES” message is displayed on the screen and all the parameters will be set to their factory default values, which settings ensure appropriate functioning.

- **Calibration screen**



On this screen we can select the toroid transformer type which is installed into the unit. By the proper selection the controller will be aligned with the installed hardware.

Using the “SCREEN PAGING” buttons we can display all the parameters in order if they can be calibrated.

EDI TRAF0 CHANGE  
<- 1700W/300V +>

Selection of the toroid transformer  
Select the type using the Left-Right arrows!

#### 4. Operation states and modes

- DISABLED state
- ENABLED state
- AUTO operation
- MANUAL operation

- **Disabled state**

In this operation state – regardless to the operation mode – the unit don't execute any process, the toroid transformer is uncharged.

- **Enabled state**

In this state the unit executes the process steps according to the operation mode, and the transformer is charged!

- **Auto operation**

If the unit is ENABLED and AUTO mode then the set voltage will be loaded on the unit output terminals – only if the „START” input (X3:1-2 terminal) is active. In this operation mode the current control will function: if the current value exceeds the set limit then the unit decreases the voltage load until the current will be below the set limit. Of course the unit tries to reset the original voltage value after passing the “EDI OVER CURRENT RESET.” delay. If on this voltage value the current again exceeds the set current limit, then the unit decreases the voltage according to the previously described way.

- **Manual operation**

If the unit is ENABLED and it is switched to MANUAL mode, then the set voltage will be loaded on the unit output terminals. In this mode the current control doesn't function.

This operation can take max. for 1 minute in case of inactive state of the „START” input (*operation for testing*). After 1 minute the unit switches back to AUTO operation mode.

## 5. Failure messages

In case of any failure event the description appears on the screen and the unconfirmed signal output activates (*closed relay contact*).

The unaccepted failures can be acknowledged by pressing the “ACKNOWLEDGE” button and also the signal outlet will be reset.



U.ACK:	105V/3.1A
CURRENT HIGH	

The V/A is flashing only for information acknowledge by pressing the ENTER button

The activated signal output (*closed relay contact*) will remain active until there's any not accepted failure in the system.

ACTIV:	105V/3.1A
CURRENT HIGH	

The V/A is flashing only for information Paging with the Up-Down arrows

### „F1 AC FAULT”

This failure is called if the F1 circuit breaker cuts the feed-back circuit (*e.g. continuity problem or activated circuit breaker*).

**This failure completely switch off the unit control!**

### „F4 DC FAULT”

This failure is called if the F4 circuit breaker cuts the feed-back circuit (*e.g. continuity problem or activated circuit breaker*).

### „K1 DO NOT SWITCH”

The failure is called if the unit is switched ON, but the K1 solenoid switch doesn't provide feed-back on its input (*e.g. continuity problem or solenoid switch malfunction*).

### **„K2 DO NOT SWITCH”**

The failure is called if the K2 soft starter solenoid switch is active, but it doesn't provide feed-back on its input (*e.g. continuity problem or soft starter solenoid switch malfunction*).

**This failure completely switches off the unit control!**

### **„OVER CURRENT”**

The over current failure is displayed when the output current reaches the maximum (6,0A) limit. (*i.e. in case of the EDI ion exchanger unit failure or wrongly chosen outlet voltage*)

**This failure completely switch off the unit control!**

### **„CURRENT LEAKAGE”**

The failure is called if the output current exceeds the set minimum limit when the unit is switched OFF (*i.e. the EDI power supply circuit is a short circuit or can't switch off*)

**This failure completely switch off the unit control!**

### **„CURRENT HIGH”**

The current high failure is displayed if the outlet current exceeds the set limit (*i.e. a cleaning is required on the EDI ion exchanger unit or the outlet voltage was chosen wrongly*).

### **„CURRENT LOW”**

This failure is called when the output current can't reach the minimum limit (*i.e. the EDI ion exchanger unit circuit is cut and there's no power consumption*).

### **„LOW VOLTAGE”**

The failure is called when the outlet voltage drops to a defined rate (percentage) of the set nominal voltage (*i.e. the EDI power supply buffer capacitor is old or the AC 230V power supply mains voltage dropped with a significant value*).

The mains power supply deviation problem can be compensated by using the proper primer circuit terminal of the toroid transformer.

### **„CONTROL FAULT”**

The failure is displayed when the “START” signal is active but there’s no run feed-back (*i.e. the control unit is switched off or some of the failures block its functioning*).

## 6. State information

The actual running state information of the unit and the failures are given as outlet contacts (*i.e. toward a supervision system where this unit functioning can be followed*)

### **„EDI OP. READY SIGNAL”**

This output is active if the unit is ENABLED, it is in AUTO mode and there's no critical failure signalling (*F1, F4, K1, K2 Failures*).

### **„EDI OPERATING SIGNAL”**

The operating signal is active when the output current exceeds the minimal current limit (*there's a current in the EDI ion exchanger circuit*)

### **„EDI FAULT SIGNAL”**

The signal is active when a failure is called or is still active:

- The output will periodically activate if there is any unaccepted failure in the system.
- the output will be active if there's any active failure in the system but all the failures are already accepted (acknowledged).

### **„EDI CONDUCTIVITY HIGH FAILURE SIGNAL”**

The signal output is active if the product water specific conductivity exceeds the set limit (*if this kind of failure is detected for minimum the set duration*)

### **„EDI ACTIVE FAILURE SIGNAL”**

The signal is active if there's an active failure in the system.

### **„EDI UNACKNOWLEDGE FAILURE”**

This signal is active if there's any unaccepted failure in the system.

## 7. Unit programming

The unit is factory pre-programmed to satisfy the maximum requirements. Of course our company makes the necessary software changes if the customer requires a modification. The running parameters can be set using the display and the keyboard.

## 8. Technical features

Box type:	TRACON 700 x 500 x 250
Power supply:	230V - 50Hz
Electronic shock protection mode:	connection to Null phase
Max. power consumption:	400VA (C2A), 700VA (C4A), 1200VA (C6A), 1500VA (C10A)
Outlet voltage options (DC):	5-50V, 10-100V, 20-200V, 30-300V (can be chosen in 12 steps)
Outlet current limitation:	DC0.5A - DC5.0A (in auto mode)
AC components of the output DC voltage:	less than 1V (on 300V nominal)
PLC type:	UNITRONICS JZ10-11-T40
Display type:	UNITRONICS JZ10-11-T40

## 9. Maintenance and operation manual

The proposed maintenance period is 1 year (*i.e.: checking the contactors state and their adjustment*).

**The maintenance can be executed only by skilled specialist!**

**The unit can be operated only by educated stuff!**

## 10. Quality control

The manufactured unit is tested on a long term function test by the followings:

Our company checks all the operation process steps by applying manual sequence stepping and automatic run. During the test we inspect if the process steps are changed by the conditions of the inputs (*level or other instrument or input signalling*) or by the process step durations and if the proper outputs are provided (*solenoid switch and motor controls*).

When the unit executes a defined process step we check if the controlling outputs (*solenoid switch and motor controls*) are in accordance to the control logic diagram and the functioning of the inputs (*level or other instrument or input signalling*). Furthermore we check the displayed messages on the programmed languages. These tests are executed for all the process steps.

If the unit includes instruments ( *$\mu\text{S/cm}$ , *pH*, *Rx*,  $^{\circ}\text{C}$ , etc.), then their functioning is also checked and the switching limits are set for these values.*

On the inspection form the function probe duration is recorded in the „Notes of the service stuff” section and also the manufacturer and quality control person signs are indicated. In case of any deviation the quality control leader must be notified by describing the failure in the “Quality notes” section of the form.

# 11.Connection terminal wiring diagram

