



# *GE Power Management*

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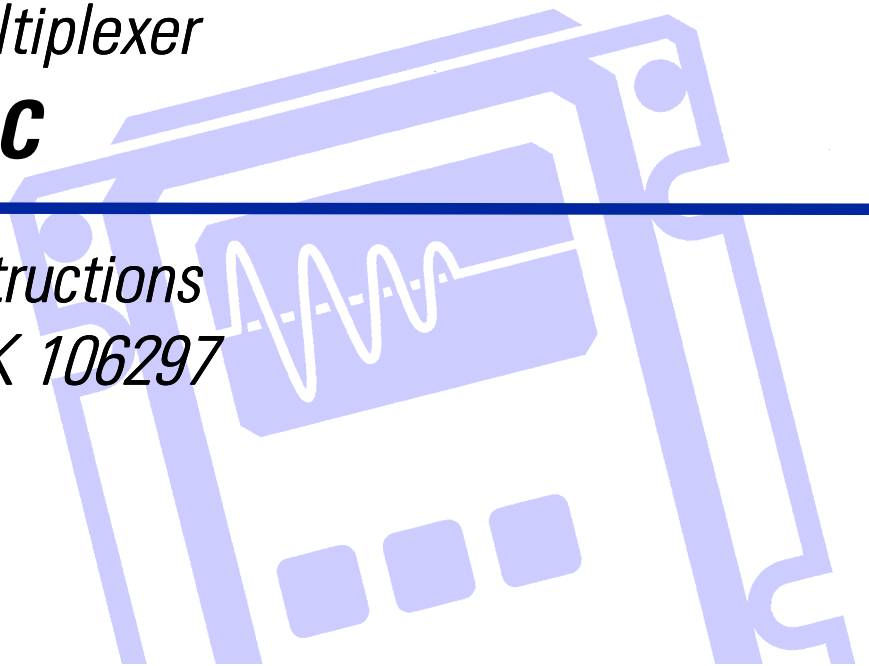


*Fibre Auxiliary Communications  
Multiplexer*

***FAC***

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*Instructions  
GEK 106297*





*Anything you can't find?*

*Anything not clear enough?*

IF YOU HAVE ANY COMMENT ON THE CONTENTS OF THE PRESENT MANUAL, KINDLY FAX US A COPY OF THIS PAGE TOGETHER WITH A COPY OF THE PAGE WHERE YOU HAVE FOUND THE PROBLEM, TO THE FAX NUMBER +34 94 485 88 45 FILLING IN THE QUESTIONNAIRE BELOW. WE WILL BE HAPPY TO SOLVE YOUR DOUBTS, AND WE THANK YOU FOR HELPING US IMPROVE THIS MANUAL.

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Manual GEK code: \_\_\_\_\_  
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# 1.

## OVERVIEW

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FAC1000/2000 (**F**ibre **A**uxiliary **C**ommunications) is a multiplexer oriented to multi-point communication with several devices using optical fibre. It provides one or two inputs and multiple outputs.

This unit accepts three types of input depending on the requirements in each case. These types are as follows:

- In series (RS-232)
- Plastic optical fibre.
- Glass optical fibre.

Communication between devices connected to a FAC1000/2000 is Full-Duplex, and the input selection will vary depending on how far the FAC1000/2000 is located from the main equipment (on Figure 3 we can see an orientative table for the correct selection of the input type according to distance).

As per the number of outputs, thanks to its modular design, FAC models are available with 6, 12, 18, or 24 plastic optical fibre outputs, and 4, 8, 12 or 16 glass optical fibre outputs.

**The information provided herein does not intend to cover all details of variations of the described equipment nor does it take into account the circumstances that may be present in your installation, operating or maintenance activities.**

**Should you wish to receive additional information, or for any particular problem that cannot be solved by referring to the information contained herein, please contact GENERAL ELECTRIC POWER MANAGEMENT.**

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2.

**ORDERING CODE**

The necessary data to define a FAC model are described on the table below.

FAC	*	0	0	0	A	*	0	*	*	00	DESCRIPTION
	1										One input
	2										Two inputs
											<b>Outputs</b>
						0					6 1mm plastic O.F. outputs
						1					12 1mm plastic O.F. outputs
						2					18 1mm plastic O.F. outputs
						3					24 1mm plastic O.F. outputs
						4					4 50/125 glass O.F. outputs
						5					8 50/125 glass O.F. outputs
						6					12 50/125 glass O.F. outputs
						7					16 50/125 glass O.F. outputs
											<b>Input(s)</b>
								0			RS232 input
								1			1mm plastic O.F. input
								2			100/140 or 200 PCS glass O.F.
								3			50/125 or 62.5/125 glass O.F.
											<b>Auxiliary Voltage</b>
									G		48 - 125 Vac-dc
									H		110 - 250 Vac-dc



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### **3.**

## ***APPLICATION***

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The versatility of this equipment allows its connection with a wide range of devices: computers, protection and control equipment, communications equipment, etc.

The FAC provides Data Broadcasting communication. Using a FAC1000/2000, one equipment can transmit data simultaneously to N different devices connected to the outputs. In the same way, any of the equipment connected to an output can communicate with the main equipment.

FAC1000/2000 provides redundancy to the system. Should one of the inputs fail, the unit will continue to maintain communication via the second port.

An example of application is the connection between a computer and several digital protection and control equipment. This way of connection provides galvanic isolation for all the equipment, avoiding noise on the line.

The FAC1000/2000 can also be used as physical media converter, allowing the interconnection between heterogeneous devices: RS232 to glass or plastic optical fibre, glass O.F. to plastic O.F.

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## **4. TECHNICAL CHARACTERISTICS**

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### **4.1 TEMPERATURE RANGE**

Effective Range : -5°C to +40°C  
Operative Range : -10°C to +55°C  
Storage Range : -40°C a +65°C

### **4.2 ISOLATION**

Between each terminal and chassis: 2000 Vac during 1 min at industrial frequency

### **4.3 POWER SUPPLY**

There are two different models available:

MODEL G : 48-125 V ac/dc  
MODEL H : 110-250 V ac/dc

### **4.4 CONSUMPTION**

Less than 1W for models with 6 plastic O.F. outputs

### **4.5 HUMIDITY**

Up to 95% without condensing.

### **4.6 TYPE TESTS**

#### **Dielectric Tests**

According to CEI 255-5.  
Except for RS-232

#### **Voltage Tests**

According to CEI 255-5.

#### **Radiated Interference Tests**

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According to CEI 801-3

**Fast Transient**

According to CEI 801-4

## 5.

## ***OPERATION PRINCIPLES***

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Figure 1 shows the wiring diagram for FAC1000/2000.

The FAC provides Data Broadcasting communication. Using a FAC1000/2000, one equipment can transmit data simultaneously to N different devices connected to the outputs. In the same way, any of the equipment connected to an output can communicate with the main equipment.

In this case, communication of the secondary devices with the main equipment must follow an order, as while the main unit can “talk” with all the secondary units, it can only receive information from one at a time.

Auxiliary voltage is applied through terminals 3 and 4. Polarity is not important if DC is used. Grounding is performed using terminal 1.

Wiring related to communications are carried out as follows:

- Input(s) (RS-232, plastic O.F. or glass O.F (100/140), depending on models) will be connected to the main communications equipment.
- Outputs are connected to each secondary equipment.

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## **6.**

## ***CONSTRUCTION***

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### **6.1. CASE**

The FAC1000/2000 case is made of aluminium. Its dimensions are shown on Figure 2.

### **6.2. IDENTIFICATION**

The complete relay model is shown on the faceplate.

For a correct identification of the FAC1000/2000 model, check it with the Ordering Code table.

### **6.3. EXTERNAL CONNECTIONS**

The external connections are shown on Figure 1.



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## **7.                    *RECEPTION, HANDLING AND STORAGE***

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This relay is supplied to the customer in a special package, which adequately protects it during transportation, as long as this is performed under regular conditions.

Immediately after receiving the relay, the customer should check whether it shows any signs of transportation damage. If it is apparent that the relay has been damaged by inappropriate handling, it must be immediately advised in writing to the carrier, and the damage must be reported to the manufacturer.

For unpacking the relay, regular precautions and care should be taken. Also be careful in order not to lose the screws supplied in the same box.

If it is not intended to install the relay immediately, it is recommended to store it in its original package, and keep it in a dry and dust-free place.

It is important to check whether the model number on the frontal name plate match the model number in your order.

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## **8.**

# **INSTALLATION AND TESTS**

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### **8.1. INTRODUCTION**

The FAC1000/2000 shall be installed in a clean, dry, and dust and vibration free place.

### **8.2. POWER SUPPLY CONNECTION AND GROUNDING**

The power supply is carried out through terminals 3 and 4. Polarity is not important when using VDC.

The relay is grounded through terminal 1.

### **8.3. COMMISSIONING AND TESTS**

Before proceeding to commissioning, the FAC must be connected to the main communications equipment. On the other end of the FAC shall be the connectors for the secondary devices. Each pair **Tx** (transmitter), **Rx** (Receiver) creates a node, and each node has a number.

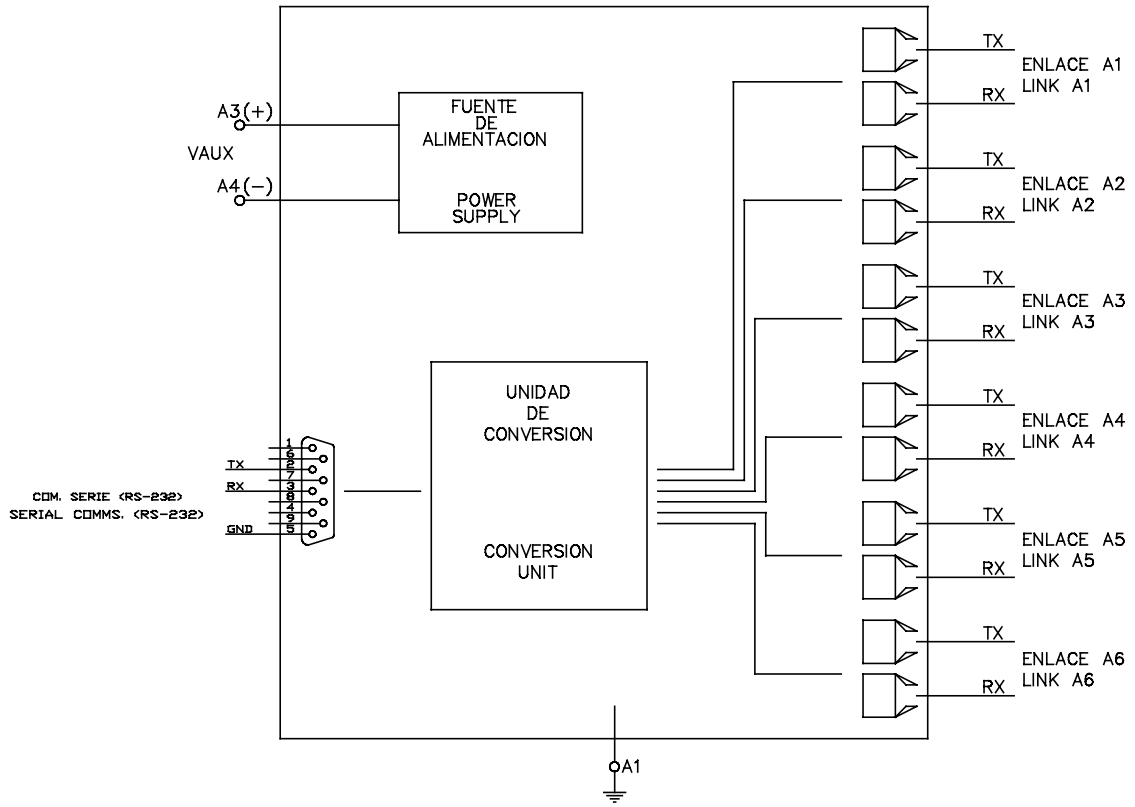
For easily checking the correct operation of each optical fibre node (input/output), we will need a jumper, that re-directs the data sent through the output back to the input of the same node. This way, the main equipment will receive the same data it has sent, if the node works correctly. The jumper is created easily using a connector and a small piece of optical fibre, as shown on Figure 4. In order to check that the received information is the same as what has been sent, it is possible to use any commercial software allowing Full-Duplex communication.

Once all the necessary connections have been made (it is important not to remove, during the tests or later, the protective covers from the unused optical fibre connectors), we can turn the FAC on. Once the READY LED is lit, it must remain lit while the TX and RX LEDS are unlit. Now we can proceed with the above-mentioned test.

While we test each node, if we remove the covers from the connectors with the FAC turned on, the main equipment might receive wrong information, as one O.F. receiver is exposed to light.

During communication, the TX LED will blink while the main unit sends information, and the RX LED will blink while it is receiving information.

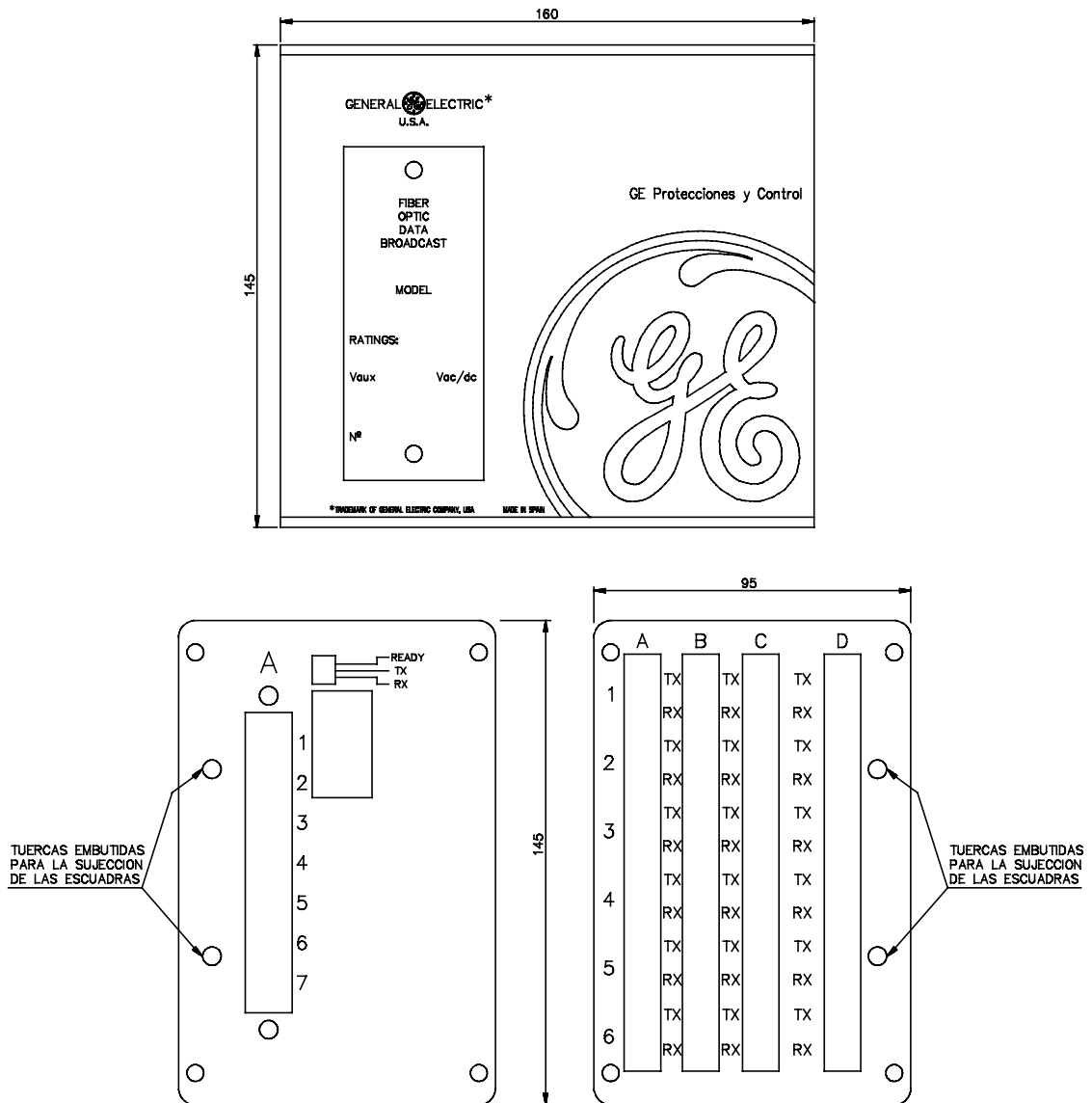
**FIGURE 1**



**FAC1000/2000 WIRING DIAGRAM (60510101)**

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**FIGURE 2**



**DIMENSIONS AND MOUNTING (60250100)**

**FIGURE 3**

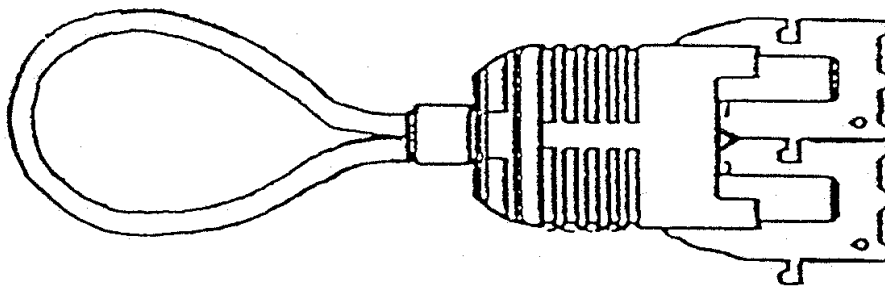
The input type selection depends sometimes unequivocally on the distance between the FAC1000/2000 and the main communications device. However in such distances where several input types are eligible, other considerations must be taken about reliability, speed, insensitivity to noise and external interferences, isolation, etc.

DISTANCE	POSSIBLE INPUTS
Up to 15 meters	RS-232 Plastic O.F. 100/140 Glass O.F.
From 15 to 80 meters	Plastic F.O. Glass F.O. 100/140
From 80 to 1000 meters	Glass F.O. 100/140

**NOTE :** The maximum distance for each O.F. type (plastic or glass) can be higher depending on the type of fibre used.

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**FIGURE 4**

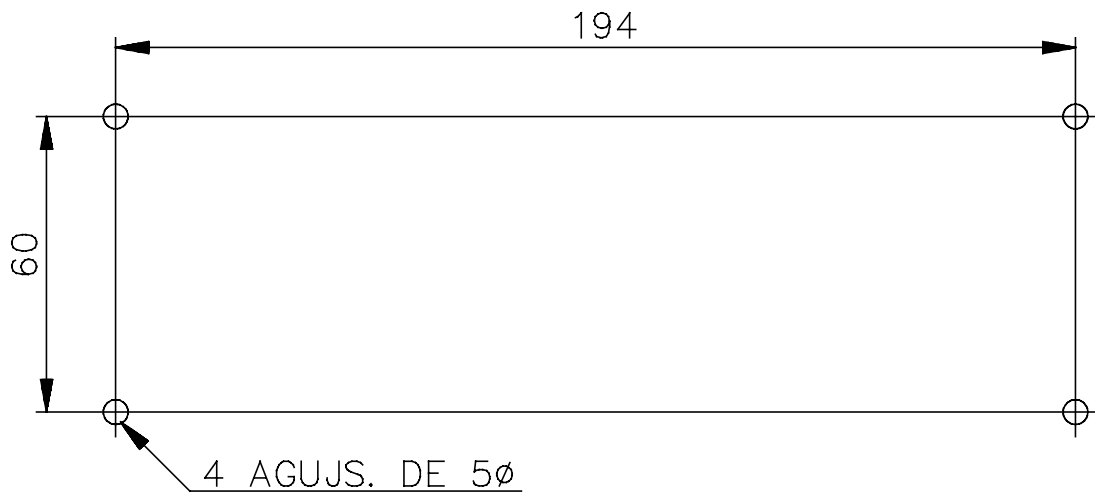


**DETAIL OF THE TESTING JUMPER FOR A COMMUNICATIONS NODE**



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**FIGURE 5**



**DIMENSIONS FOR HOLDING THE MODULE (74440100)**