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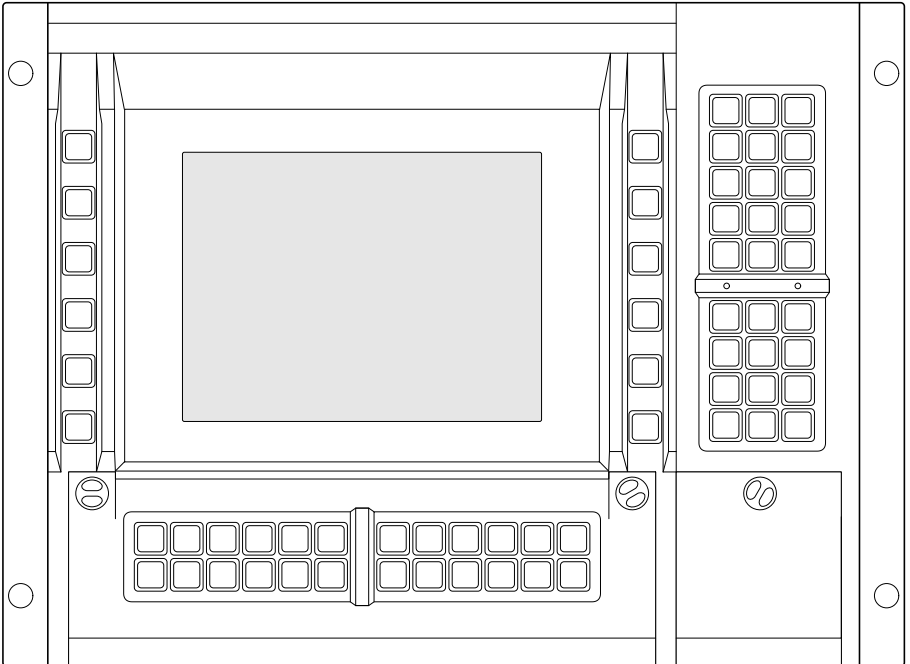
## 1.1 Introduction

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### 1.1-1 Presentation

The CCX 77 FP and CCX 77 FR cell controllers are industrial microcomputers. They are mounted in 19" racks or can be built into custom designed panels.

They are designed around a highly integrated system board (based on surface mount technology), integrating as standard, or via local extensions, all of the usual system functions. This means that all of the extension slots on the system bus are fully available for additional function boards.



The experienced user can refer directly to the table of operating characteristics in Section 1.5.

---

## 1.1-2 Basic Elements

<b>Microprocessor</b>	The CCX 77 FP/FR cell controllers use an 80486 micro-processor.
<b>Dynamic RAM memory</b>	A minimum of 4 Mbytes of RAM memory is built-into the basic system. This may be expanded to 16 Mbytes (refer to Sub-section 4.2).
<b>CMOS user memory</b>	A 128 Kbyte CMOS long-life battery backed RAM memory (3 to 5 years of operation) is used for storing small files using utility software supplied with the cell controller.
<b>Hard disk</b>	A hard (fixed) disk unit is provided for long term data storage.
<b>Diskette drive</b>	A diskette drive takes standard 3"1/2 IBM format diskettes (1.44 Mbytes and 720 Kbytes).
<b>Color monitor</b>	The front panel comprises a 9.5" VGA color monitor, resolution 640 x 480.
<b>Keyboards</b>	<p>A built-in operator keypad provides 27 keys (numeric keypad and dual-function cursor keys) and two sets of 12 function keys (with dual alphanumeric marking) are located on the front panel vertical and horizontal doors of the cell controller. These dedicated keypads, and any external keyboard connected, can be locked-out by a keyswitch.</p> <p>CCX 77 FR cell controllers are in addition equipped with "reflex" action keys (refer to Sub-section 3.1 for further information).</p>
<b>Time/date clock</b>	A battery protected clock provides the current date and time.
<b>RS 232C (COM1) port</b>	A 9-pin male connector for an RS 232C serial link (to IBM PS/2 standard) is provided.
<b>Parallel connection (LPT1) port</b>	A 25-pin female connector for a two-way parallel link (to IBM PS/2-CENTRONICS standard).
<b>Series 7 (COM2) port</b>	<p>A 26-pin high-density female connector for a dual standard serial link supporting RS 485 / 20mA current loop connection.</p> <p>This port enables a direct connection between TSX 7 and Series 1000 PLCs and the UNI-TELWAY bus.</p>
<b>Video output port</b>	A 15-pin high-density female connector for connecting a VGA standard monochrome or color monitor.
<b>Power supply</b>	Power is supplied via a 110 VAC or a 220/240 VAC industrial supply (-15% + 10%), 50/60Hz, 170 VA.



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**Basic Elements (continued)**

<b>Software key slots</b>	The cell controllers have two slots for software protection key modules containing the user access rights to run proprietary Telemecanique program packages.
<b>Extension slots</b>	Three full-length IBM PC-AT standard extension slots are provided for extension cards.

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**1.1-3 Extension Elements**

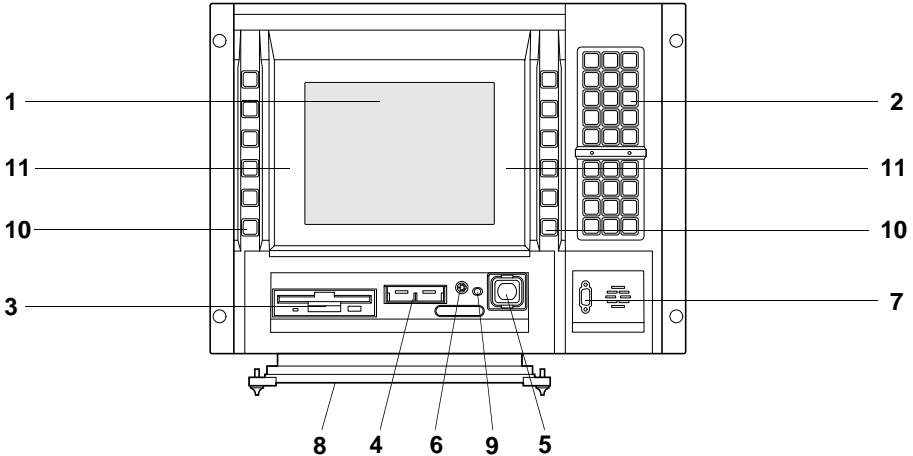
<b>Dynamic RAM memory</b>	4 or 8 Mbyte memory extension modules are available to increase the total RAM capacity.
<b>Rechargeable batteries</b>	Batteries ensure autonomous operation during a power break (for up to 20 minutes depending on the configuration).
<b>Optional cards</b>	Three full-length extension slots accept IBM PC-AT (ISA bus) compatible cards.
<b>Discrete outputs (ALF0 and ALF1)</b>	Two relay outputs are available. These outputs may be used for indicating states or alarms (watchdog, temperature level, programmable alarm, etc).

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## 1.2 Physical Appearance

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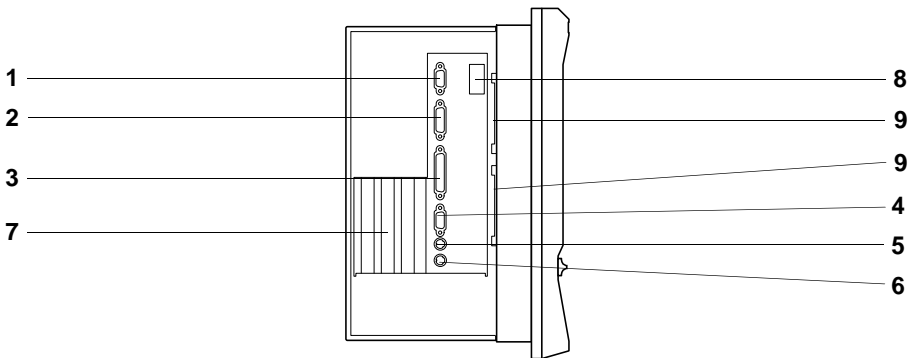
### 1.2-1 CCX 77 FP/FR Front Panel



- 1 9.5" STN Double Scan high-resolution VGA (640 x 480) color monitor.
- 2 27 key keypad (numeric keypad, and dual-function cursor keypad and display brightness and contrast adjustment).
- 3 Diskette drive for 3 1/2" standard IBM format (1.44 Mbyte or 720 Kbyte) diskettes.
- 4 Slots for two software protection keys which provide the access rights to Telemecanique software packages (TE90 standard).
- 5 Two-position keyswitch to enable or disable data entry and command selection from the keyboards and keypads (built-in or external) and to enable or disable processor restarting via button 9.
- 6 IBM PS/2 standard external keyboard connector, (for front panel connection to the KBD connector located on the back panel).
- 7 RS 232C Serial port (COM1), (for front panel connection to the RS 232C(COM1) connector located on the back panel).
- 8 Operator keypad comprising two sets of 12 sealed function keys (F1 to F12 and S1 to S12 with two levels of alphanumeric identification).
- 9 Processor reset button for restarting the system.
- 10 Reflex keys (CCX 77 FR only) enabling direct control of the inputs to a PLC.
- 11 Locations provided for self-adhesive labels for identifying the reflex keys.

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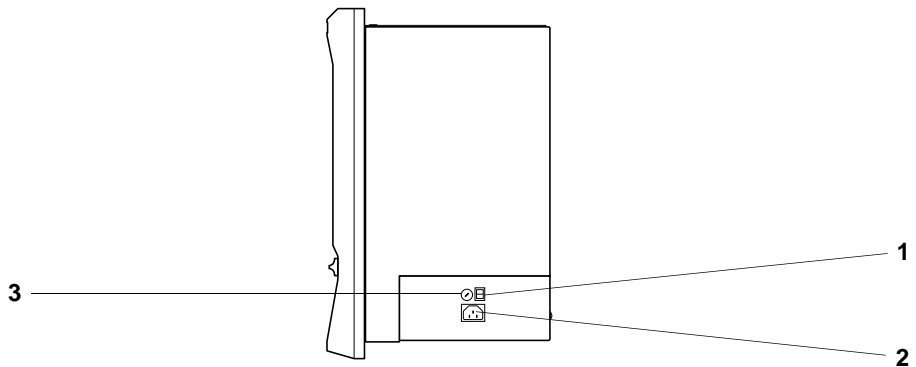
## 1.2-2 Left Side Panel



- 1 15-pin, high density VGA video connector.
- 2 Isolated RS 485/current loop serial interface port (COM2) with a 26-pin high density female connector for connection to a UNI-TELWAY bus.
- 3 IBM PS/2 standard two-way parallel interface port (LPT1) (25-pin female connector).
- 4 RS 232C serial interface port (COM1) (9-pin male connector). This connector is functionally equivalent to the one located on the front panel. It is normally used to connect the extension cable for the front panel connector, but this cable can be disconnected to allow direct connection to this port on the back panel. It is not possible to connect two cables simultaneously to the front and side panels.
- 5 PS/2 mouse port (micro-DIN connector).
- 6 Micro-DIN female connector for a PS/2 compatible external keyboard. This connector is functionally equivalent to the one located on the front panel. **Never connect two external keyboards simultaneously using the front and side panel connectors.**
- 7 Three IBM PC-AT (ISA bus) standard slots for full-length extension cards (these slots will accept network interface boards for example). Each slot is provided with a cover to protect it when no extension card is present.
- 8 Discrete outputs ALF0 and ALF1.
- 9 Output connector for reflex keys.

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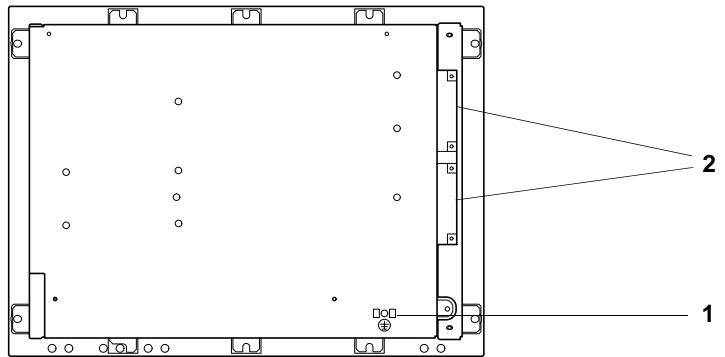
### 1.2-3 Right Side Panel



- 1 ON/OFF switch,
- 2 Mains power receptacle for the AC power cord,
- 3 Mains power voltage selector (110/127 or 220/240 VAC)

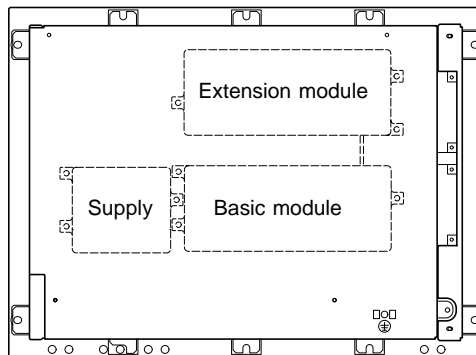
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## 1.2-4 Back Panel



- 1 Screw connector for product grounding.
- 2 Connectors for reflex keys.

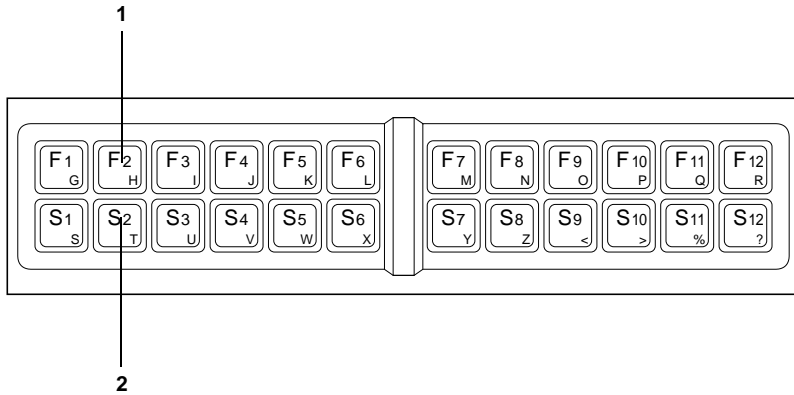
The back panel can also be used to attach TBX remote I/O modules and their power supply, in the locations shown in the figure below:



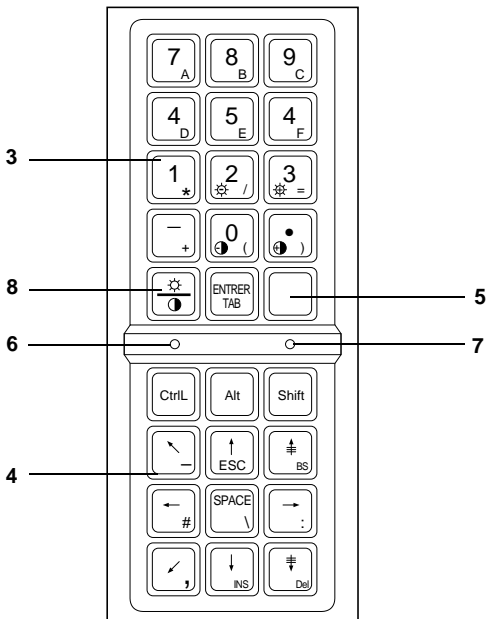
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## 1.2-5 Keyboards

### Horizontal keypad



### Vertical keypad



- 1 Function keys F1 to F12 (corresponding to function keys F1 to F12 on the IBM compatible keyboard) and alphabetic keys.
- 2 Function keys S1 to S12 (corresponding to Shift + function keys F1 to F12 on the IBM compatible keyboard) and alphanumeric keys.
- 3 Dual-function or triple-function (for screen adjustment) numeric keypad.
- 4 Dual-function cursor keys.
- 5 Key for accessing the second level of dual-function alphanumeric keys.
- 6 Red indicator LED showing hard disk activity.
- 7 Green indicator LED showing that the cell controller is powered-up and indicating power supply status (for more information on this indicator, refer to Sub-section 4.4-2).
- 8 Key for accessing screen brightness and contrast adjustments.

The user can connect an external keyboard to CCX 77 FP/FR cell controllers. This keyboard can be connected and disconnected under power. When an external keyboard is connected in addition to the built-in keypads, the user can utilize either set of keys without affecting the context (as long as only one keyboard is active at any one time).

### Important

The language of the built-in keypad must be selected in the SETUP program (for further information, refer to Sub-section 5.2-7).

## 1.2-6 Adjusting the Screen Brightness and Contrast

### Adjusting the contrast

Press key 8 shown in the diagram on the vertical keypad, then press the



### Adjusting the brightness

Press key 8 shown in the diagram on the vertical keypad, then press the



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## 1.3 Specific Features

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### 1.3-1 Monitoring the Ambient Temperature

When the ambient temperature of the cell controllers exceeds 40°C, the built-in temperature probe triggers an audible and visible alarm (the red indicator LED, designated 6 on the vertical door keypad blinks). This alarm can also be made available via a relay output that can be assigned to this task by configuration. In order to avoid any damage to components, such as the hard disk, etc, the power supply is automatically cut off if no action is taken within 2 minutes.

Wait 20 seconds before powering-up again with the On/Off switch.

---

### 1.3-2 Discrete Outputs

The cell controllers are fitted with two relay outputs which can have various functions depending on the configuration (defined in the SETUP program):

#### **ALF0 output**

This output may be configured in one of two ways:

- Assigned to the user, in which case it can be controlled by program independently of the state of the machine, or
- Assigned to the system, in which case it reflects the state of an internal watchdog which is activated if there is a serious failure (stoppage of the processor or the internal clock).

#### **ALF1 output**

This output may be configured in one of three ways:

- Assigned to the user, in which case it can be controlled by program independently of the state of the machine, or
- Assigned to the temperature alarm, in which case the output is activated when an excessive temperature level is detected inside the terminal (refer to Sub-section 1.3-1), or
- Assigned to the state of the power supply, in which case the output is activated when the terminal is operating with a battery which has fallen to 10% of its capacity.



### **1.3-3 Operational Safety Devices**

#### **Tamper-proof password**

Each cell controller is fitted with an access control system which limits access to authorized persons only, via a tamper-proof password, even after disconnection of the internal battery.

#### **Tamper-proof individual serial number**

A tamper-proof individual serial number appears each time the system is powered-up. This serves as a deterrent to theft.

#### **Specific rights of use for Telemecanique software**

Each terminal has a slot for two TE90 standard Telemecanique software protection key modules.

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## 1.4 Operating Systems and Utility Software

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### 1.4-1 Operating Systems

The cell controllers are supplied, depending on the configuration, with DOS or OS/2 operating systems.

PC compatibility is not guaranteed if operating systems other than those recommended by Telemecanique are used.

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### 1.4-2 Telemecanique Utility Software

Telemecanique utility software is split into two groups:

- The SETUP program resident in ROM, displays the cell controller configuration parameters in English and allows the user to change them.
- A set of multilingual utilities supplied on two 3 1/2" diskettes (ref. T FTX LF TS 252) and including a SETUP program functionally identical to the resident SETUP program.

The functions of these programs are described in Sections 5 and 6.

---

### 1.4-3 Using the Cell Controllers with MS-DOS

The MS-DOS operating system is recommended. If the user needs to install or reinstall the MS-DOS operating system, it is important that the recommendations below be followed:

- After installing the MS-DOS operating system, delete the following line from the CONFIG.SYS file:  
- DEVICE=DISPLAY.SYS CON=(EGA,,1)
- Delete the following two lines from the AUTOEXEC.BAT file:  
- MODE CON CODEPAGE PREPARE=....  
MODE CON CODEPAGE SELECT=....
- In addition, to allow for later installation of the OS/2 operating system, also:  
- Add the following line in the CONFIG.SYS file:  
SHELL=C:\DOS\command.com/P/E:256  
- Add the following two lines in the AUTOEXEC.BAT file:  
SET COMSPEC=C:\DOS\command.com  
COPY C:\DOS\command.com C:\

## 1.5 Characteristics

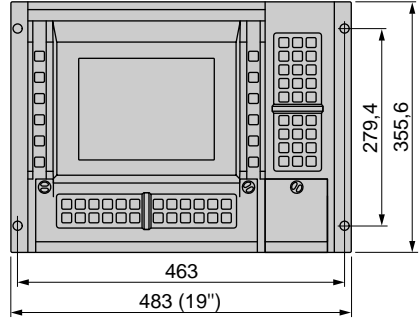
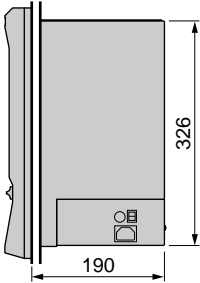
CCX 77 Cell Controller		FR 6C	FP 8C	FR 8C
<b>Processor</b>		80486 SX 25 MHz	80486 DX2 66 MHz	80486 DX2 66 MHz
<b>Hard Disk</b>	Capacity	Depending on configuration		
<b>RAM</b>	Standard	Depending on configuration		
	Expandable to 16 Mb	16 Mb	16 Mb	16 Mb
<b>Coprocessor</b>		Built-in		
<b>Reflex Keys</b>		Yes	No	Yes
<b>Diskette Drive</b>		1	1	1
		3 1/2" IBM standard format (1.44 Mb and 720 Kb)		
<b>Screen</b>		9.5" VGA high-resolution color, 640 x 480		
<b>Keypads</b>		26-key operator keypad (dual-function numeric/cursor keypad) and 24-key operator keypad (dual-function alphanumeric keys)		
<b>Serial Ports</b>	Standard	RS 232C serial port (DB9 connector)		
		Two-way parallel port (DB25 connector)		
	Series 7	RS 485 serial link/current loop port		
	Mouse	IBM PS/2 standard		
	Video Port	For VGA monochrome or Multisync color monitor		
	Networks	FIPWAY, ETHWAY, MAPWAY with extension board		
<b>Power Supply</b>	Standard	Via 110 - 220/240 VAC industrial mains supply, apparent power 170 VA.		
	Extension	Rechargeable batteries for autonomous operation during power breaks (up to 30 minutes).		
<b>Discrete Outputs (ALF0 and ALF1)</b>		Two lines (ALF0 and ALF1). 220 VAC / 0.25 A and 25 VDC / 1 A relay outputs.		
<b>Extension Slots</b>		Three full-length extension slots (PC-AT and ISA bus compatible)		
<b>Operating Systems</b>		DOS and OS/2 depending on the configuration		
<b>Operational Safety</b>		<ul style="list-style-type: none"> <li>• Access via tamper-proof password</li> <li>• Tamper-proof individual serial number</li> <li>• Slot for Telemecanique software protection key modules</li> </ul>		
<b>Dimensions</b>	Size	H = 355.6 mm	W = 483 mm	D = 190 mm
	Weight	15 Kg		
<b>Temperature</b>	Storage	-40°C to +60°C		
	Operation	+5°C to +40°C		
<b>Environment</b>		Hardware designed for use in industrial environments (mechanical shocks, electromagnetic interference)		

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## 1.6 Dimensions and Mounting

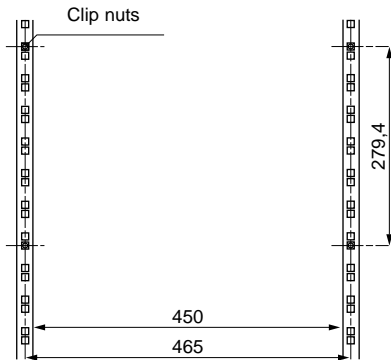
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### Dimensions

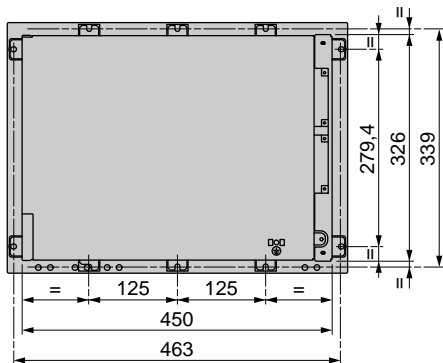


### Mounting

#### 19" rack mounting



#### Flush mounting



The cell controllers must only be installed in consoles or control panels with a protection level of at least IP 54. They can be:

- Mounted in 19" racks (with four M6 CS, CHC, CMX retaining screws - through the front panel),
- Flush mounted (with four M6x18 - retaining screws through the front panel). To ensure complete dust and damp protection, add six M6x (12 + max. panel thickness) retaining screws - mounting is from the back.

## 2.1 Checking the Equipment

The relevant product references are given in the automation systems catalog:

Terminal	Accessories and Software	Documentation and Utilities
<div data-bbox="169 475 393 639" data-label="Image"> </div> <p data-bbox="221 667 349 689">CCX 77 FP/FR</p>	<p data-bbox="505 435 692 456">TFTX CA5 mains cord</p> <div data-bbox="456 472 725 501" data-label="Image"> </div> <p data-bbox="572 549 624 569">Fuses</p> <div data-bbox="482 580 703 600" data-label="Image"> </div> <p data-bbox="482 619 725 639">TD 5 x 20 5A    TD 5 x 20 2A</p> <div data-bbox="482 783 538 943" data-label="Image"> </div> <p data-bbox="563 804 721 895">Self-adhesive strips for identifying reflex action keys on the CCX 77 FR</p>	<p data-bbox="781 464 1034 509">CCX 77 FP/FR User's Manual TCCX DM 77 FP</p> <div data-bbox="829 552 975 719" data-label="Image"> </div> <p data-bbox="781 810 1034 855">DOS utility programs 1 3 1/2" diskette T FTX LF TD5S</p> <div data-bbox="869 871 936 943" data-label="Image"> </div> <p data-bbox="781 999 1034 1043">OS/2 utility programs 1 3 1/2" diskette T FTX LF TS252</p> <div data-bbox="869 1059 941 1134" data-label="Image"> </div>
<h3>Depending on configuration</h3>		
<p data-bbox="631 1283 781 1303">Operating System</p> <ul data-bbox="631 1331 692 1385" style="list-style-type: none"> <li>• DOS</li> <li>• OS/2</li> </ul> <div data-bbox="710 1326 781 1401" data-label="Image"> </div>		

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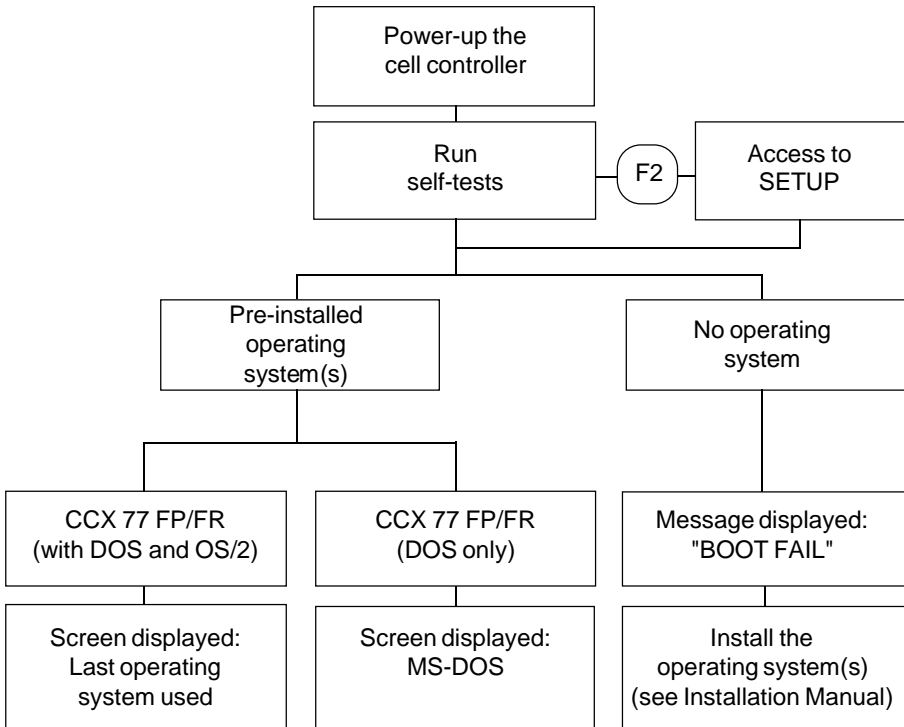
## 2.2 Powering-up

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### 2.2-1 Introduction

On power-up, the cell controllers run a series of self-tests, then display one of the following:

- The first screen of the operating system used,
- An error message if no operating system is installed in the terminal.



**2.2-2 Self-Test Screens**

The cell controllers perform the following sequence of self-tests when first powered up, or after resetting (pressing on the pencil-point pushbutton RST, designated 9 in Sub-section 1.2-1) or when restarting (by pressing <Ctrl>, <Alt> and <Del> on an external keyboard). The cell controllers perform the self-tests described below:

- Testing the base RAM memory: 639 Kb (640 Kb less 1 Kb reserved for the BIOS),
- Testing the RAM memory reserved for the system: 384 Kb,
- Testing the expanded RAM memory: 1024 Kb, 3072 Kb, 5120 Kb, 7168 Kb or 15360 Kb,
- Testing the type of video: VGA,
- Testing the processor's protected mode,
- Testing the keyboard,
- Testing the diskette drive controller,
- Testing the hard disk,
- Testing the math coprocessor,
- Testing the serial ports,
- Testing the parallel port,
- Testing the 128 Kb CMOS memory,
- Testing the real-time clock.

**Example of a self-test screen**

T e l e m e c a n i q u e		CCX 77 BIOS Ux.y Copyright 1993	
CHIPS 65520/525/530		UGA 32Kb BIOS Uz.t Copyright (c) 1992	
CCX 77	Serial Number: 21222363		
Base Memory	:	639Kb	OK
System Ram	:	384Kb	OK
Extended Memory	:	7168Kb	OK
Video type	:	VGA	
Virtual mode	:	OK	
Keyboard	:	OK	
Diskette Drive(s)	:	1	
Hard Disk	:	1	
Math Coprocessor	:	0	
Serial Port(s)	:	2	
Parallel Port(s)	:	1	
User Cmos Memory	:	128Kb	
Real Time Clock	:	OK	
Configuration	:	OK	
***Press F2 key continuously to run SETUP***			

Each time the self-tests are performed, the configuration is saved to a permanent memory in order to compare the present configuration with the preceding configuration, (when the last self-test sequence was run). If the two configurations are different (for example, by the addition of RAM memory, math coprocessor, etc), the operator should save the new configuration by pressing the F1 key.

If one of the tests is incorrect, a message (for example *Error*) is displayed on the line opposite the faulty element. In order to explain this message and to facilitate maintenance, additional data may also be provided in the *ERROR REPORT* window: (e.g. Keyboard Stuck Key: 21) and/or in the display line at the bottom of the screen.

T e l e m e c a n i q u e		CCX 77 BIOS Ux.y Copyright 1993
CHIPS 65520/525/530		UGA 32Kb BIOS Uz.t Copyright (c) 1992
CCX 77	Serial Number: 21222363	
Base Memory	: 639Kb OK	- ERROR REPORT -  Keyboard Stuck Key : 21
System Ram	: 384Kb OK	
Extended Memory	: 7168Kb OK	
Video type	: UGA	
Virtual mode	: OK	
Keyboard	: Error	
Diskette Drive(s)	: 1	
Hard Disk	: 1	
Math Coprocessor	: 0	
Serial Port(s)	: 2	
Parallel Port(s)	: 1	
User Cmos Memory	: 128Kb	
Real Time Clock	: OK	
Configuration	: OK	

Display line ———



---

### 2.2-3 Messages Associated with the Sub-groups Tested

<b>x</b>	Memory size or number of peripherals.
<b>OK</b>	Sub-group test correct.
<b>Error</b>	Sub-group test incorrect. Read the additional data, if present, in the ERROR REPORT window and in the display line (see following paragraphs).
<b>Resident SETUP activated</b>	Selection of SETUP (by pressing F2 during the self-tests) has been taken into account.
<b>Checksum error</b>	Configuration error. Use SETUP to correct this error. (Warning, some files may still be open).
<b>Changed (VERIFY then strike F1 key)</b>	The configuration has been modified (additional memory or peripherals installed). Press F1 for the terminal to accept the new configuration.

---

### 2.2-4 Report Confirmation Messages

These messages are displayed in the ERROR REPORT window.

When one of these messages appears, switch the terminal off for a few seconds and then switch it on again.

If the message reappears, please contact Telemecanique support.

<b>Memory size error</b>	Memory size error (memory has been increased or cannot be used). Call-up SETUP to display the memory configuration or press F1 to confirm the additional memory.
<b>Memory error addr (data)</b>	RAM memory access error.
<b>Low meg. chip select error</b>	
<b>Video subsystem error</b>	VGA video sub-system fault.
<b>Keyboard stuck key xx</b>	Key xx on the keyboard is blocked (stuck). Check whether this key was pressed accidentally. xx: corresponds to the code generated by the key (in hexadecimal notation).
<b>System or keyboard error</b>	Keyboard controller fault.
<b>Keyboard clock fail</b>	Communication error between the keyboard and the terminal.
<b>Interface fail</b>	Keyboard self-tests are incorrect.

---

<b>Keyboard test failure</b>	Keyboard not present. Plug in the keyboard and reinitialize the system by pressing F1.
<b>Diskette init error</b>	Faulty diskette drive or controller.
<b>Disk controller failure</b>	Faulty hard disk.
<b>Disk C: Error test</b>	
<b>User Cmos checksum error</b>	Checksum error in the CMOS memory, parameters modified. Use SETUP to modify the parameters. (Warning, some files may still be open).
<b>!!WARNING!! Replace battery</b>	Change the time/date clock backup battery.

---

## 2.2-5 Messages Shown in the Display Line

<b>Resume = F1 key</b>	Press F1 to continue. This <b>automatically</b> saves changes in configuration.
<b>Resume = F1 key or Run SETUP = F2 key</b>	Press F1 (for example, to save a change in configuration) or run SETUP by pressing F2.
<b>Press F2 key continuously to run SETUP</b>	During power-up, keep F2 pressed down to run SETUP.
<b>Password</b>	Enter password.
<b>OK</b>	Password correct.
<b>Invalid</b>	Password incorrect.
<b>Battery option ON Press any key to confirm!!!</b>	Press any key to confirm terminal being powered by battery. If there is no confirmation within 10 seconds, the selection is that defined in SETUP: terminal switched off.
<b>Boot fail ? [ENTER] to retry</b>	Fault in system files on the diskette or hard disk. Diskette or hard disk not formatted. Insert a new system diskette in drive a: and press <Enter> to continue.
<b>No boot sector ? [ENTER] to retry</b>	The diskette inserted in a: or the hard disk, is not a system disk(ette). Insert a new system diskette in drive a: and press <Enter> to continue.

### 2.2-6 Error Messages which Stop the System

The following messages correspond to serious faults and cause the system to stop. If this occurs, contact Telemecanique support.

- **Err ITs controller - HALT**
- **Err. I/O 16 Bits - HALT**
- **Err Hot NMI - HALT**
- **Err Timer failure - HALT**
- **Err Timer interrupt failure - HALT**
- **Err 8042 last command not accepted - HALT**
- **Invalid product Type - HALT indicates that the configuration is invalid.**

#### **Note**

In the event of excessive ambient temperature (greater than 40° C) when the CCX cell controllers are powered up, they automatically switch off.

Under normal operation, this fault is indicated by the hard disk indicator lamp blinking (designated 6 on the vertical keyboard, as described in Sub-section 1.2-5) and by an audible beep. The user then has two minutes to back up all files before system shutdown.

---

## 2.3 Inserting the Software Protection Key Modules

---

A Telemecanique software protection device with the appropriate right of use must be present when running Telemecanique programming and operating software. This right of use is contained in a key module supplied with the corresponding software.

The rights of use are handled by the following utility programs:

- KEY MANAGER, included in the XTEL-BASE software package for Telemecanique software that runs in the X-TEL or MINI X-TEL Software Workshop environment,
- UKEY included with Monitor 77 software,
- TSX TSC MG for Telemecanique software running under DOS.

The cell controllers have slots for two TE90 standard software protection key modules.

### Insertion procedure

- 1- Open the access door where the vertical keypad is located (Figure 1)
- 2- Insert the keys into the slots (Figure 2).

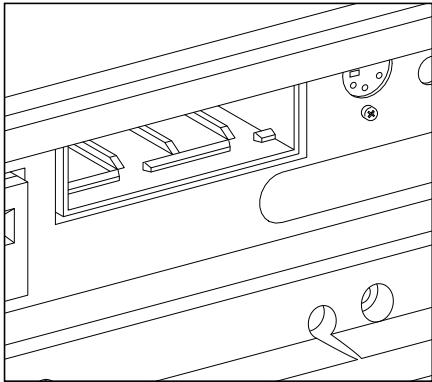


Figure 1

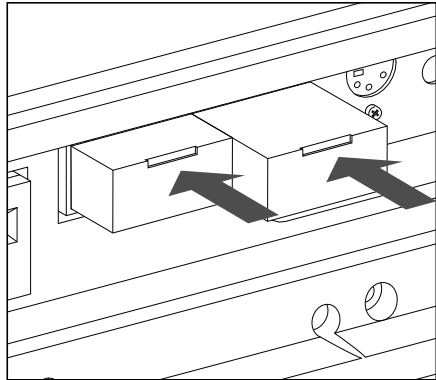
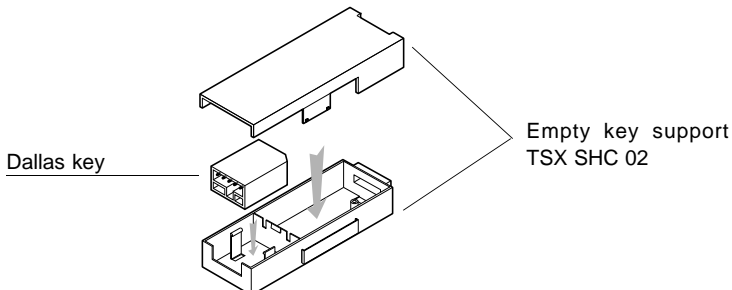


Figure 2

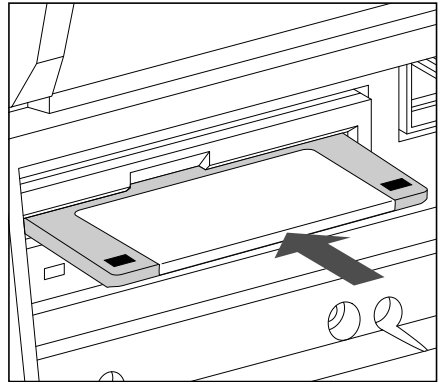
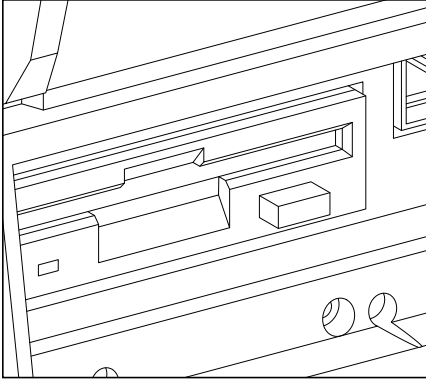
For MONITOR 77 software running under DOS, the software key module (Dallas key) must be inserted into the empty key support (reference TSX SHC 02) as shown below:



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## 2.4 Handling the Diskettes

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### 2.4-1 Precautions

To ensure that diskettes are always read and written to correctly and to extend their useful life, the following precautions need to be taken:

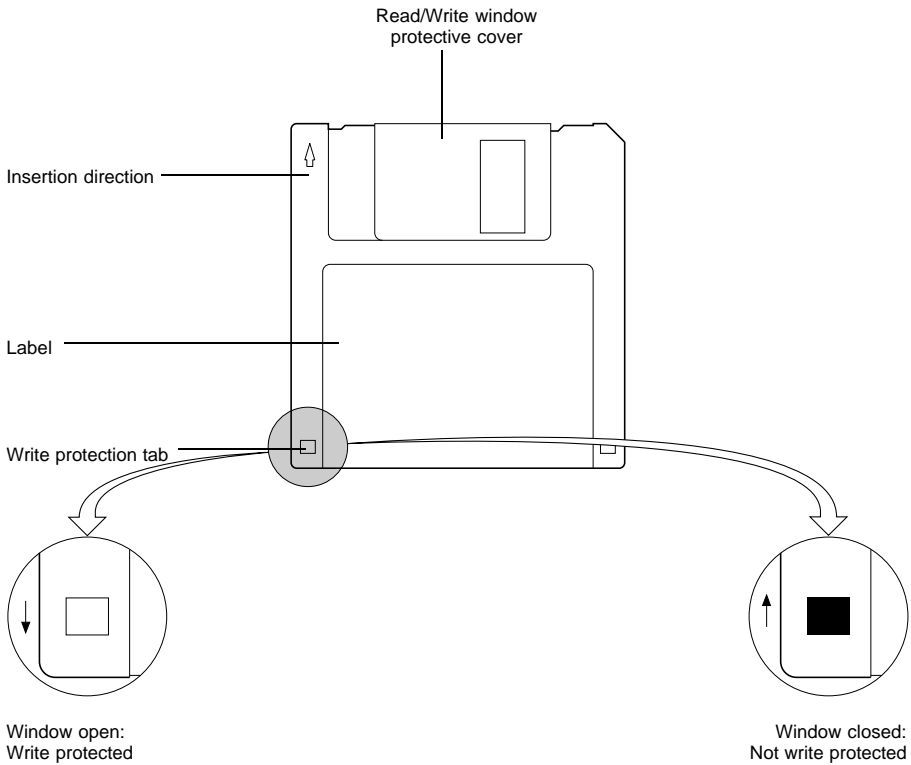
- Store the diskettes in the shade and away from extreme temperatures,
- Keep the diskettes in their original box or in a box made specially for this purpose,
- Do not clean the recording surface of any diskette. Cleansing products may render the contents of the diskette unreadable,
- Do not expose the magnetic surface by dismantling the diskette or by sliding open the metal protection plate,
- Do not touch the magnetic surface of the disk. Fingerprints prevent the data being read,
- Protect the diskette from dust and smoke,
- Do not place heavy objects on the diskettes,
- Do not use an eraser to remove the wording on labels. Particles of rubber may slide under the plastic cover,
- Keep diskettes well away from any magnetic source as this may destroy data.

---

## 2.4-2 Write-Protecting Diskettes

When a diskette is write-protected, it is impossible to add, modify or erase files. This prevents accidental deletion of data. On 3 1/2" diskettes a sliding plastic tab, located in one corner of the diskette, covers or uncovers a small "window". When the window is open, the diskette is write-protected.

To write once again, the protection tab should simply be pushed back to close the window.

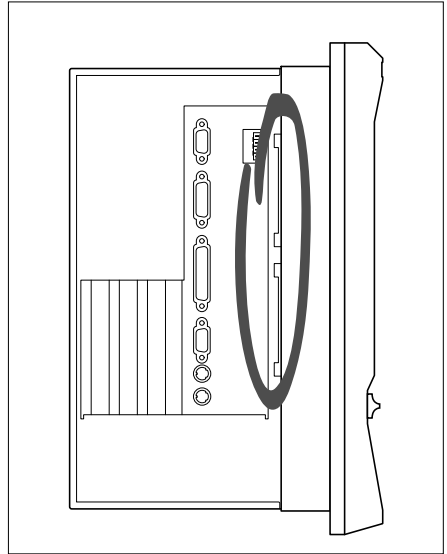
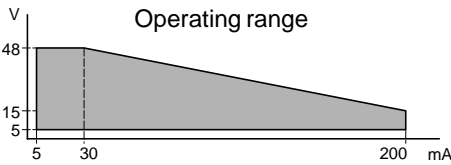


### 3.1 Reflex Keys

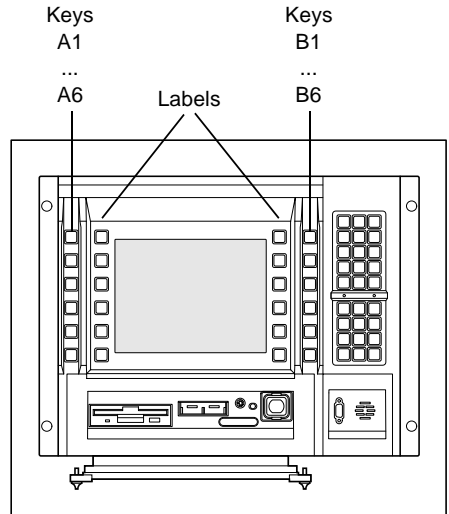
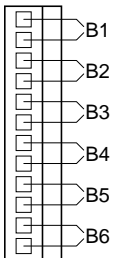
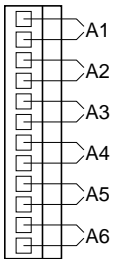
The 12 reflex keys on the CCX 77 FR (designated 10 in the diagram in Sub-section 1.2-1) can, for example, be used for manual application control. The functions of the keys can be marked on self-adhesive labels placed alongside of the screen or by including on-screen dynamic marking controlled by the application.

#### Key characteristics

48 Vmax, 200 mA max, 2 Wmax



#### Key wiring

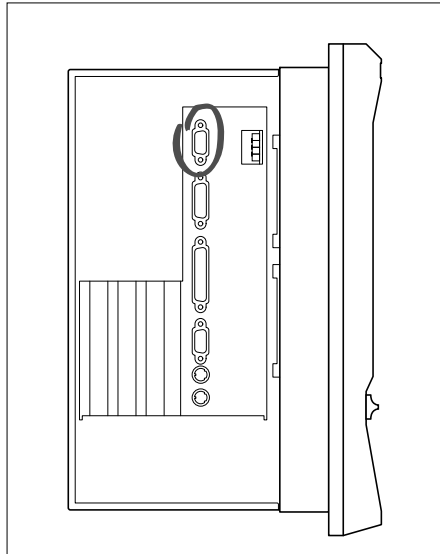


## 3.2 Monitors

### 3.2-1 General

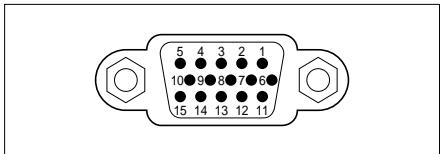
The cell controllers include a 15-pin IBM PS/2 standard video connector. It will accept any kind of monochrome or Multisync type color monitor. It supports VGA, EGA and CGA video outputs and can display up to 256 colors.

Simultaneous display on the built-in display screen and an external monitor is not supported. If an external monitor is connected, it is the only one that can be used.



### 3.2-2 VIDEO(VGA) Connector Pin Arrangement

Front view of the female connector. This connector is located on the left side panel of the cell controller (designated 1 in the figure in Sub-section 1.2-2).



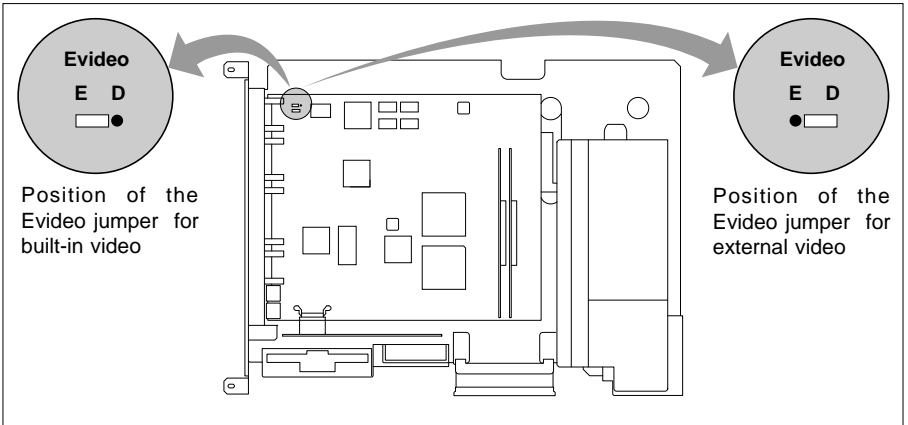
Pin Number	Signal	I/O	Description
1	RED	O	Red
2	GREEN	O	Green
3	BLUE	O	Blue
4	Reserved	-	Reserved
5	Selftest	O	Self-test output
6/7/8	0 V	-	Red/Green/Blue ground
9	PLUG	-	Connector locating device
10	0 V	-	Ground
11/12	Reserved	-	Reserved
13	HSYNC	O	Horizontal synchronization
14	VSUNC	O	Vertical synchronization
15	NC	-	Not used



### 3.2-3 Connecting an Additional Video Adapter Board

If the user prefers to use a third-party video adapter card, the cell controller's built-in video system **MUST** be completely disconnected. To perform this operation, proceed as follows:

- Power-down the terminal,
- Remove the protective cover from the back panel (refer to Sub-section 4.1-1) of the cell controller,
- Change the setting of the EVIDEO configuration on the motherboard, to inhibit the built-in video system (refer to the diagram below),
- Install the third-party video adapter card in one of the three available extension slots (refer to Sub-section 4.3). Refer to the documentation supplied with the adapter for its software set-up,
- Close the back panel protective cover,
- Connect the external monitor to the newly installed video adapter.



Do not change the position of jumpers JL1 and JL2.

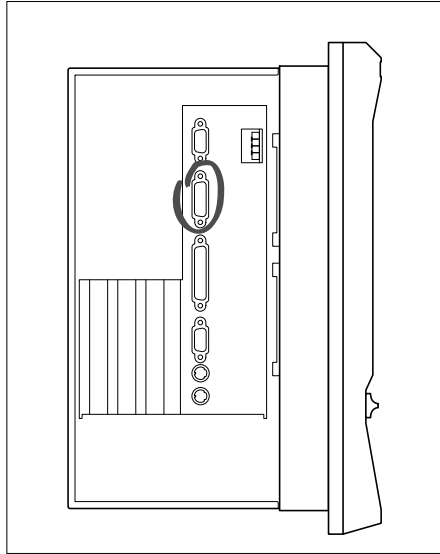
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### 3.3 UNI-TELWAY / Current Loop (COM2) Port

---

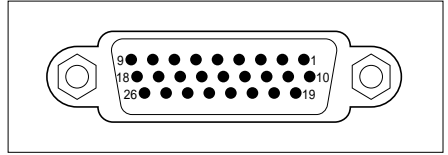
#### 3.3-1 General

The CCX 77 cell controllers have an RS 485/20 mA current loop (COM2) port for direct connection to a UNI-TELWAY bus or to Series 7 or Series 1000 PLCs.



### 3.3-2 COM2 Connector Pin Arrangement

A High-density 26-pin Sub-D female connector (front view). This connector is located on the left side panel (designated 2 in the figure in Sub-section 1.2-2).



Pin Number	Signal	I/O	Description
1	0 VL	-	0 V RS 485
2	NC	-	Not used
3	0 V	-	0 V logic
4	N3	I	UNI-TELWAY address level 8
5	/ UTW	I	Used for UNI-TELWAY protocol
6	NC	-	Not used
7	- EMI	-	0 V current loop transmission
8	+ REC	I	Current loop reception
9	+ EMI	O	Current loop transmission
10	D(A)	I/O	UNI-TELWAY line data
11	D(B)	I/O	UNI-TELWAY line data
12	NC	-	Not used
13	N1	I	UNI-TELWAY address level 2
14	N4	I	UNI-TELWAY address level 16
15	NC	-	Not used
16	0 VI	-	0 V isolated current loop
17	- REC	-	0 V current loop reception
18	+24VI	O	24 V current loop output
19	0 VL	-	0 V RS 485
20	NC	-	Not used
21	N0	I	UNI-TELWAY address level 1
22	N2	I	UNI-TELWAY address level 4
23	NP	I	UNI-TELWAY parity
24	NC	-	Not used
25	- EMI	-	0 V current loop transmission
26	+ REC	I	Current loop reception

---

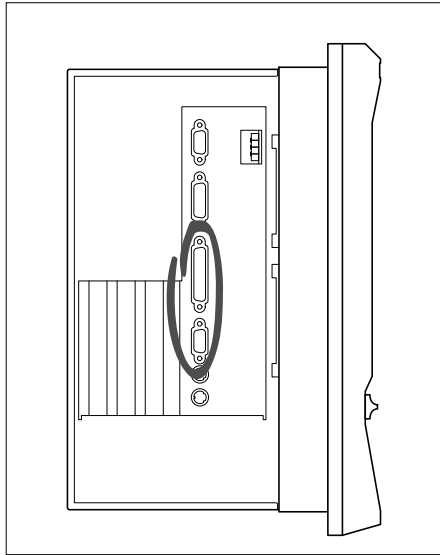
## 3.4 Printers

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### 3.4-1 General

The cell controllers connect to various types of serial printers with an RS 232C interface (9-pin connector) or parallel printers with a Centronics interface (25-pin connector). The appropriate printer driver software must be installed for the selected type of printer.

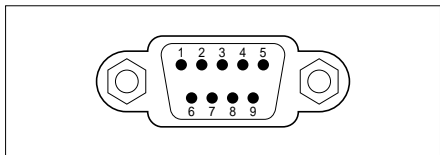
A number of these printer drivers are included in the Telemecanique installation diskettes.



---

### 3.4-2 "RS232C(COM1)" Serial Port Connector Pin Arrangement

A male connector (front view). This connector is located on the left side panel of the cell controller (designated 4 in the diagram in Sub-section 1.2-2). There is also an extension of this connector on the front panel (designated 7 in the diagram in Sub-section 1.2-1).



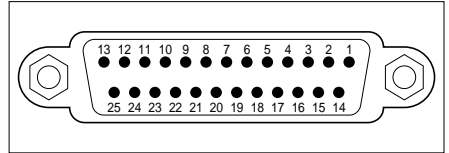
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Pin Number	Signal	I/O	Description
1	DCD	I	Data Carrier Detected
2	RXD	I	Receive Data
3	TXD	O	Transmit Data
4	DTR	O	Data Terminal Ready
5	0 V	-	Signal Ground
6	DSR	I	Data Station Ready
7	RTS	O	Request to Send
8	CTS	I	Clear to Send
9	RI	I	Ring Indicator

---

### 3.4-3 CENTRONICS “//↔ (LPT1)” Port Pin Arrangement

Female connector (front view). This connector is located on the left side panel of the cell controller (designated 3 in the figure in Sub-section 1.2-2).



Pin Number	Signal	I/O	Description
1	-STROBE	O	Strobe
2	D0	O	Data bit 0
3	D1	O	Data bit 1
4	D2	O	Data bit 2
5	D3	O	Data bit 3
6	D4	O	Data bit 4
7	D5	O	Data bit 5
8	D6	O	Data bit 6
9	D7	O	Data bit 7
10	-ACK	I	Receipt acknowledgment
11	BUSY	I	Busy
12	PE	I	Paper end
13	SLCT	I	Select
14	-AUTOFEED	O	Automatic line feed
15	-ERROR	I	Error
16	-INIT	O	Initialize printer
17	-SLCTIN	O	Select printer
18/19/20	0 V	-	Signal ground
21/22/23	0 V	-	Signal ground
24/25	0 V	-	Signal ground

---

## 3.5 Mouse

---

### 3.5-1 General

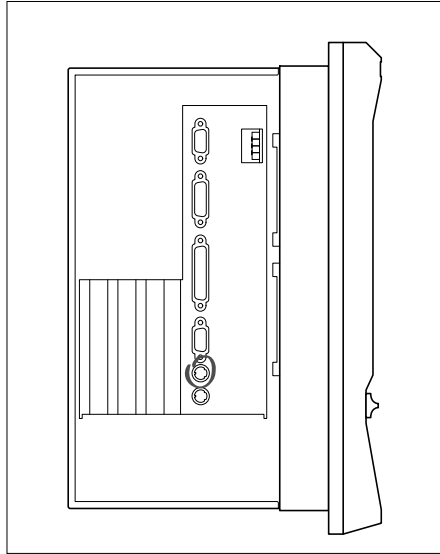
Telemecanique offers a range of pointing devices as options (mouse or trackball):

These pointing devices connect to the dedicated mouse port fitted with a standard IBM PS/2 serial link micro-DIN connector.

Instructions for setting up the various pointing devices are given in the operating systems Installation Manual.

#### Important

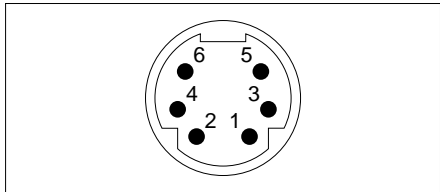
Connecting or disconnecting a mouse while the cell controller is powered-up will cause the system to lock up. The system must then be restarted.



---

### 3.5-2 Mouse Connector Pin Arrangement

A 6-pin female micro-DIN connector (front view). This connector is located on the left side panel (designated 5 in the diagram in Sub-section 1.2-2).



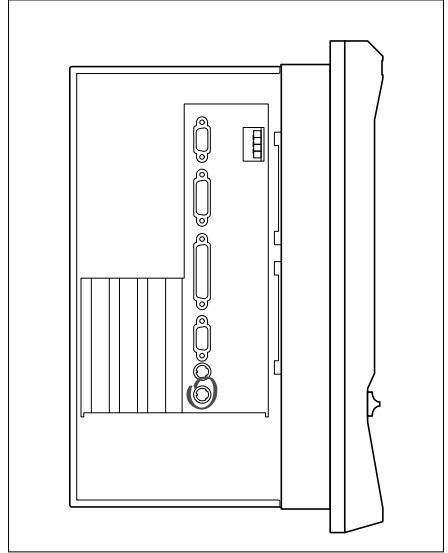
Pin Number	Signal	I/O	Description
1	MDATA	I/O	Data
2	NC	-	Not used
3	0 V	-	Ground
4	5 V	-	5 VDC
5	MCLK	O	Clock
6	NC	-	Not used

---

## 3.6 Keyboards

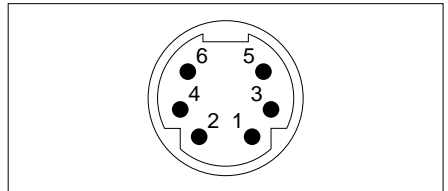
### 3.6-1 General

The cell controllers support the use of an external IBM PS/2 compatible keyboard which has either a micro-DIN or DIN connector (it is connected using a DIN/micro-DIN adapter, reference T FTX KBA 5). Never connect two external keyboards simultaneously to the front and back panels.



### 3.6-2 Keyboard "KBD" Connector Pin Arrangement

A 6-pin female micro-DIN connector (front view). This connector is located on the left side panel (designated 6 in Sub-section 1.2-2). An extension connector is also taken to the front panel (designated 6 in Sub-section 1.2-1). A two-position keyswitch lets the user enable or disable data entry. This keyswitch is located on the front panel (designated 5 in Sub-section 1.2-1).



Pin Number	Signal	I/O	Description
1	KDATA	I/O	Data
2	NC	-	Not used
3	0 V	-	Ground
4	5 V	-	5 VDC
5	KCLK	I/O	Clock
6	NC	-	Not used

---

## 3.7 Discrete Outputs ALF0 and ALF1

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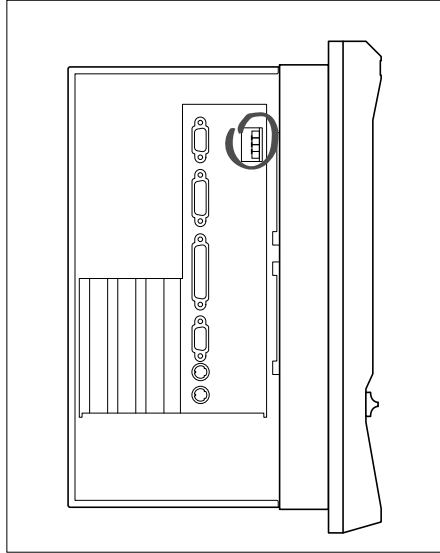
### 3.7-1 Presentation

The cell controllers are equipped as standard with two relay outputs (designated 8 in the diagram in Sub-section 1.2-2).

These two ALarm Flag outputs ALF0 and ALF1 have the following characteristics:

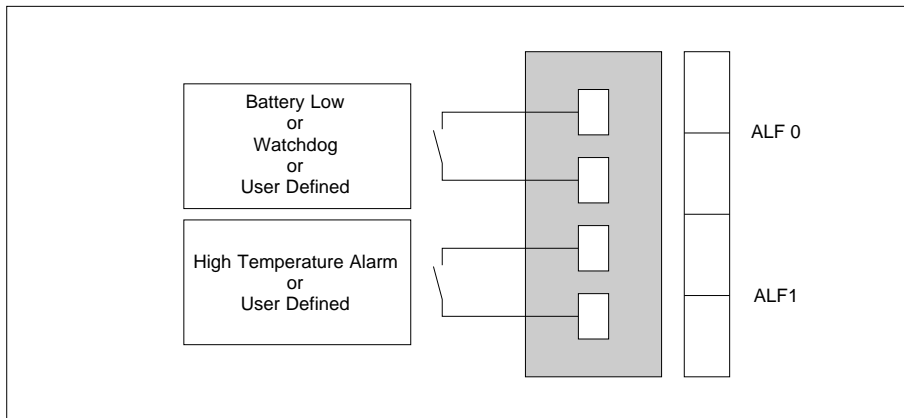
- Nominal voltage in AC: 24 - 240 V,
- Nominal voltage in DC: 24 V,
- Nominal current in AC: 0.25 A (50 VA),
- Nominal current in DC: 1 A,
- Response time:
  - Trigger: 10 ms,
  - Release: 20 ms.

The assignment of these outputs is described in Sub-section 3.7. It must be defined when the terminal is configured using SETUP (refer to Sub-section 5.2-5).



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### 3.7-2 Connections





## 4.1 Accessing Internal Extensions

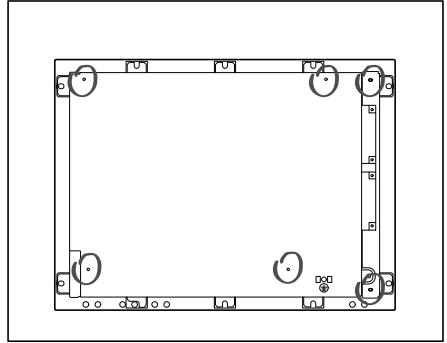
### 4.1-1 Removing the Back Cover

#### Warning

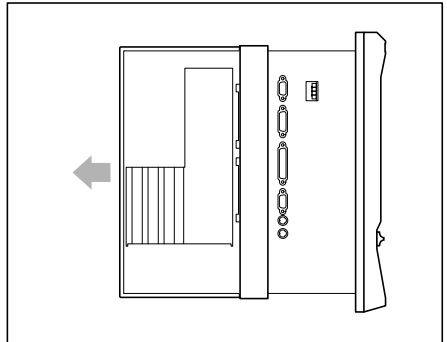
Before removing the back cover, always power-down the terminal and disconnect all power cords and connection cables.

The back cover is removed as follows:

- 1 Using a Phillips screwdriver, remove the 6 screws designated opposite.

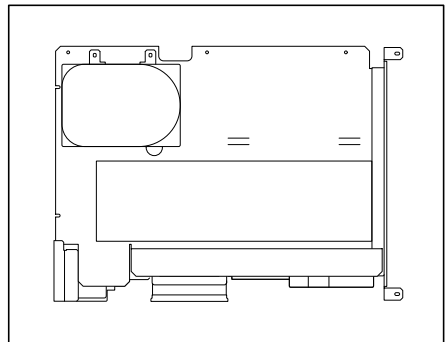


- 2 Carefully remove the back cover of the cell controller.



- 3 The extension slots (for network interfaces, IBM PC-AT standard extension boards, internal battery option, etc.) can now be accessed. To install a memory extension requires an additional operation (refer to Sub-section 4.1-2).

- 4 Once the relevant extension board has been installed, replace the back cover by repeating the above procedure in reverse order.

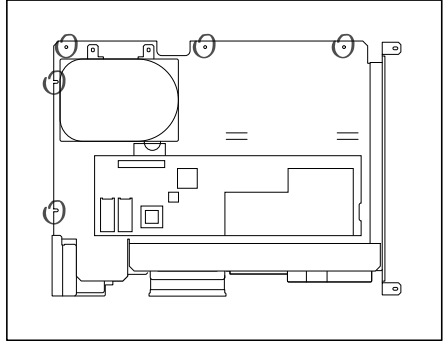


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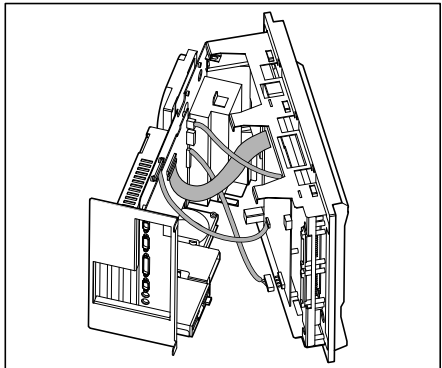
## 4.1-2 Accessing the Motherboard

Access to the motherboard is required for installing a memory extension and for replacing the real-time clock battery back-up. To gain access to the motherboard, remove the back cover as described in Sub-section 4.1-1.

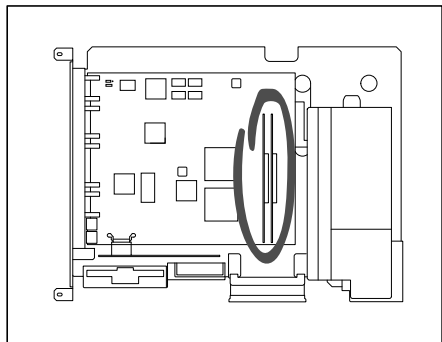
- 1 Using a Phillips screwdriver, remove the three screws and the two stand-offs designated opposite,



- 2 Slightly pivot the panel then carefully disconnect the four cables shown opposite.



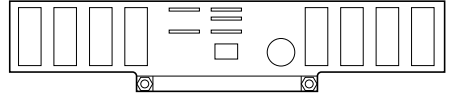
- 3 It is now possible to access the motherboard and the slots available for memory extensions. Once the extension boards are installed, close up the panel with the motherboard by repeating the above procedure in reverse order **taking care to correctly re-connect the four cables to their connectors.**



## 4.2 T CCX RAM 54 and T FTX RAM 58 Dynamic RAM Extensions

Some programs and the development of large applications require memory extensions to the cell controllers.

The 4 Mbyte T CCX RAM 54 or 8 Mbyte T FTX RAM 58 memory extensions are supplied as memory module cards that mount directly onto the motherboard.



To install a memory extension module, proceed as follows:

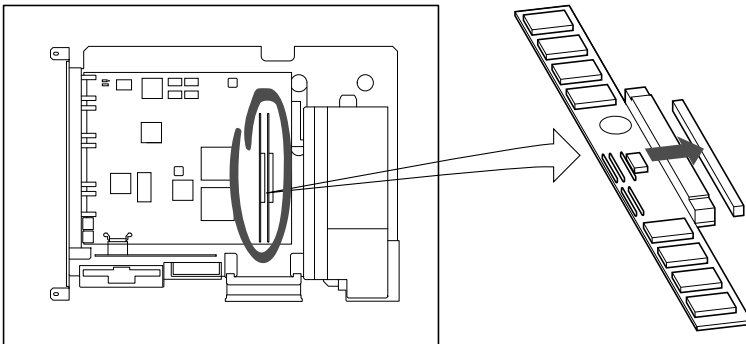
- 1 Remove the back cover (refer to Sub-section 4.1-1).
- 2 Open the panel containing the motherboard (refer to Sub-section 4.1-2).
- 3 Position the memory extension module in the dedicated connector provided, ensuring that it is the right way round (connector side on the right).

### Warning

Handle the module with great care as its components are highly sensitive to damage by static electricity:

- Do not remove the module from its anti-static packaging until the very last moment.
- Hold the module by the edges of the printed circuit.

- 4 Ensure that both ends of the module are pushed firmly into place and that it is locked down by the mounting clips.



**The standard module is inserted into the right-hand connector labeled JM0.**

- 5 Close the cell controller cover panels.

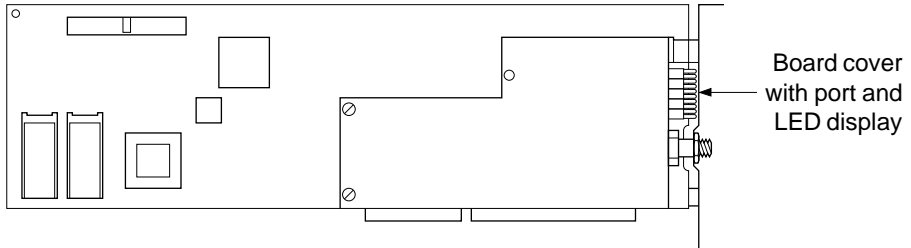
The additional memory is recognized by the system after powering-up the cell controller and pressing the F1 key (no declaration is required in the SETUP program).

---

### 4.3 IBM PC-AT (ISA bus) Extension Boards

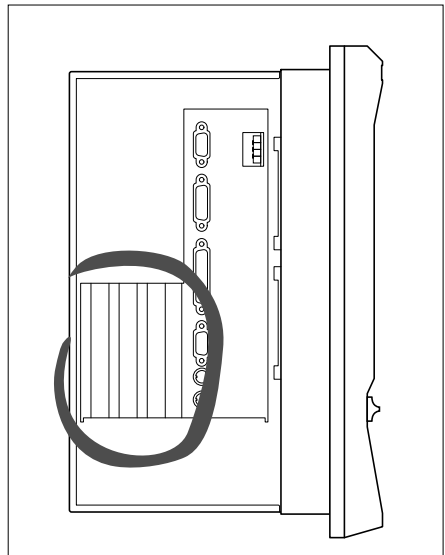
---

The cell controllers have three full-length slots for IBM PC-AT standard (ISA bus) extension boards.



Each slot has an IBM PC-AT standard double connector (62 + 36 pins).

To install an extension card, the back cover must first be removed (refer to Subsection 4.1-1). The back covers over the end of the boards are accessible from the back panel (if required for external connection).



#### Important

The maximum amount of power available to the ISA extension bus is limited making it impossible to install certain combinations of extension boards.

The tables provided in this section show:

- The power available on the ISA bus for extension boards.
- The power consumption of the standard elements supplied by Telemecanique.

The total consumption of extension boards installed in the cell controller must not exceed the available current levels.

---

**Power levels available on the ISA bus**

Products	Hard Disk	RAM	Power levels available		
			+ 5 V	+12 V	-12 V
T CCX 77 FP 8C	210 Mb	8 Mb	4.0 A	0.46 A	40 mA
T CCX 77 FR 6C	210 Mb	8 Mb	4.5 A	0.46 A	40 mA
T CCX 77 FR 8C	210 Mb	8 Mb	4.0 A	0.46 A	40 mA

**Power consumption of standard elements**

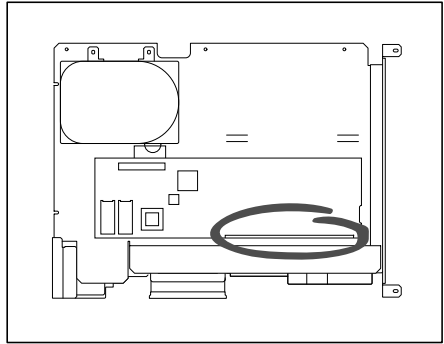
Telemecanique Ref.	Extension	Consumption			
		+5 V	+12 V	-12 V	+35 V
T FTX CHG 51	Battery back-up				0.35 A
T FTX RAM 54/58	Memory extension	0.2 A			
T FTX KB 51	External keyboard	0.2 A			

In all cases, refer to the vendor's documentation for precise information on the power requirements of the various extension boards.

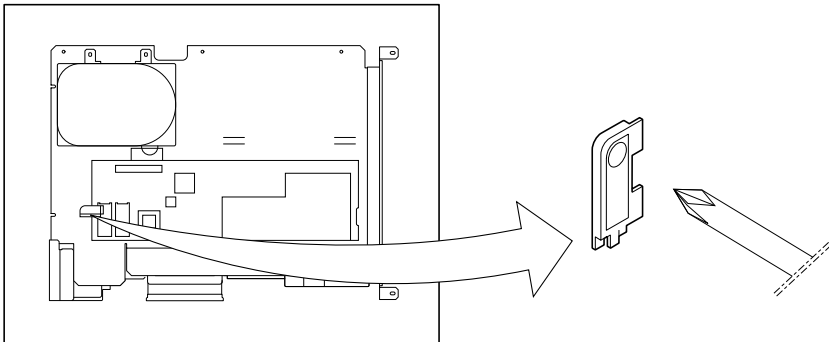
---

The extension cards are installed as follows:

- 1 Remove the back cover (refer to Sub-section 4.1-1).
- 2 Locate the three ISA bus extension slots.
- 3 Take out the back cover for the slot to be used, after removing its retaining screw.



- 4 Insert the extension board, pressing it firmly into the connectors after making any necessary DIP-switch settings on the board, as described in the vendor's documentation. It is recommended that extension boards be installed starting with the slot located closest to the system chassis.
- 5 Clamp the back edge of the extension board into place using the retaining screw through its end plate.
- 6 Clamp the front edge of the extension board into place using the locking device and tighten it down using a Phillips screwdriver.



- 7 Replace the back cover.

## 4.4 Internal Battery Back-up

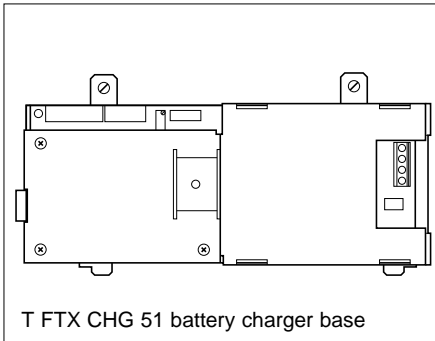
### 4.4-1 Presentation

The cell controller power supply unit is not affected by micro-cuts that do not exceed 20 ms.

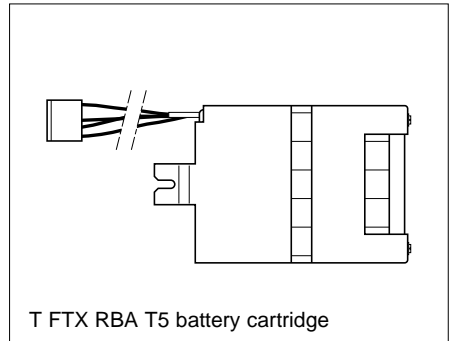
For unreliable AC supply conditions, Telemecanique can supply an optional back-up device using internal batteries and a built-in charger. This device ensures autonomous operation for up to 30 minutes (depending on system configuration).

This device has two parts:

- A battery charger base, reference T FTX CHG 51, for mounting on the cell controller chassis, accessible after removing the back cover.
- A battery unit, reference T FTX RBA T5, to attach to the T FTX CHG 51 charger.



T FTX CHG 51 battery charger base



T FTX RBA T5 battery cartridge

The T FTX CHG 51 battery charger base includes:

- A dual-rate battery charger (quick charge, trickle charge).
- A battery voltage monitoring device.
- A circuit to control the operating modes of the back-up option.
- A circuit to control the green PWR LED on the front panel of the cell controller.

## 4.4-2 Operation

### Quick charge

Quick charge is activated every time the cell controller is powered-up.

- Charging time for a battery which is well charged: about 5 min.
- Quick charge current:  $I = 350 \text{ mA}$ .

### Trickle charge

After charging, the battery charger switches automatically to trickle charge,

- Charge and trickle charge current:  $I = 15 \text{ mA}$ .
- Max. voltage threshold:  $U = 30 \text{ V}$ .

### Threshold alarm

This is the threshold for detecting the end of the reserve power ( $U = 22.5 \text{ V}$  or time  $t_f^* - 1 \text{ min}$ ). If power returns during the two protected supply phases, indicated by a long audible beep, battery charging is reactivated.

### Supply cut-off

The supply cut-off comes into operation 1 min. after the threshold alarm is triggered unless the power returns in the meantime.

#### Resetting the power supply

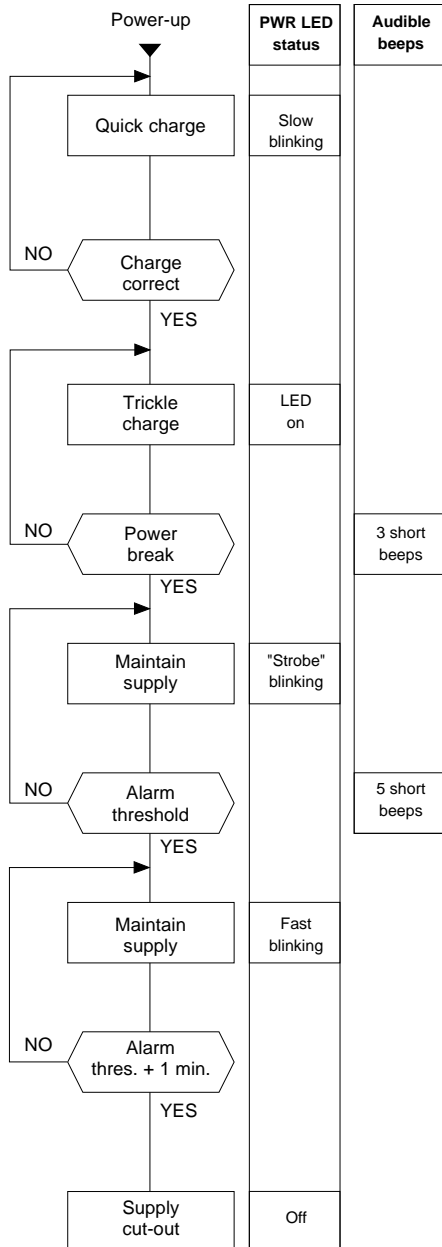
Two possibilities, depending on the situation:

- Time  $\geq 20 \text{ sec.}$  after power-break: The power supply is automatically reset.
- Time  $< 20 \text{ sec.}$  after power-break: Operate the On/Off switch, taking the 20 sec. period into account.

\*  $t_f$  = operating time limit, user defined from 1 to 15 minutes (see section 5.2-5).

### AC power return

Indicated by a long audible beep.





### **4.4-3 Charging a New Battery or After Prolonged Storage**

The following procedure is recommended to reduce the time for required for charging the battery:

- Power-up the cell controller for at least one hour (in this case trickle charging is activated).
- Power-down the cell controller.
- Power-up the cell controller again within 10 seconds (this activates quick charging). The battery is then recharged completely in less than 3 hours.

Every time the cell controller is powered-up after this, operation is as described in section 4.4-2.

**Note**

Effective autonomy of a battery depends on the charge-discharge cycle. In order to provide maximum autonomy, it is recommended that quick charging is followed by a few hours of trickle charging.

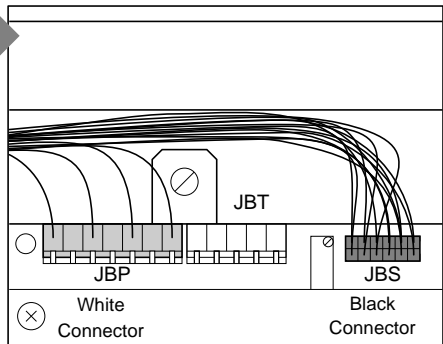
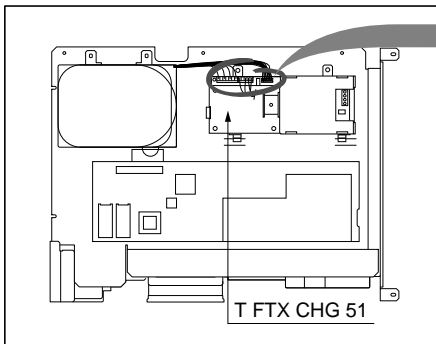
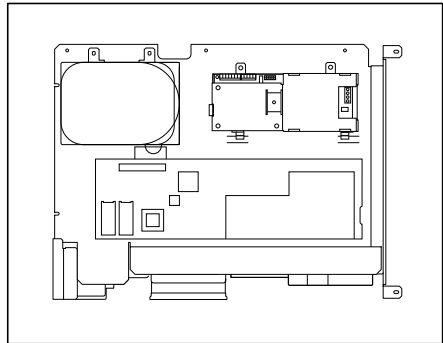
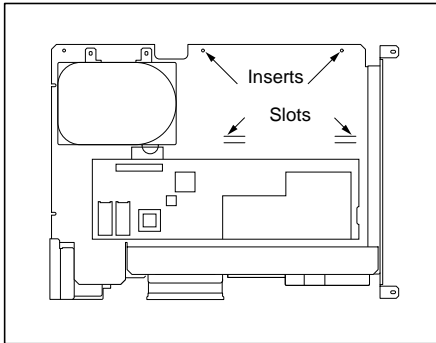
---

#### 4.4-4 Installation Procedure

##### • Installing the T FTX CHG 51 battery charger base

After switching the power switch Off and unplugging the power cord, remove the back cover (as described in Sub-section 4.1-1),

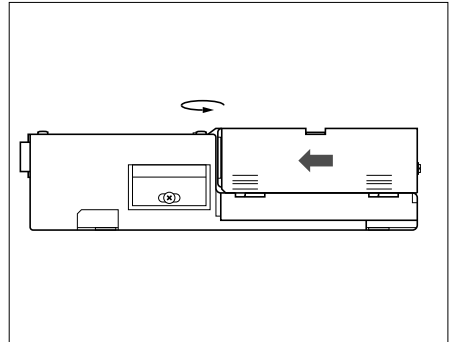
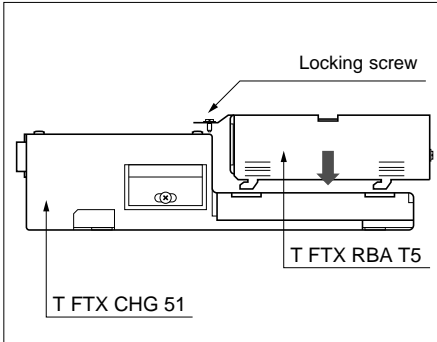
- 1 Locate the two slots and the two inserts for mounting the T FTX CHG 51 battery charger base on the cell controller chassis,
- 2 Slide the lower two tabs on the T FTX CHG 51 into the two slots and screw the two upper screws firmly into the inserts on the chassis using a flat blade screwdriver,
- 3 Plug in the two cables (two connectors, one white and one black). Note the locating device on each connector.



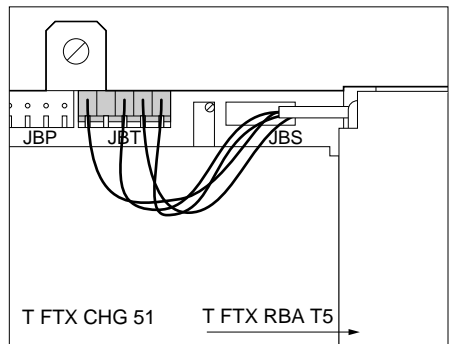
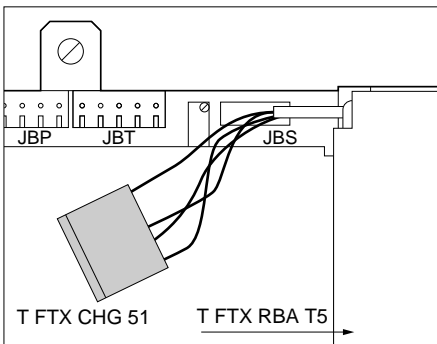
Connections on the T FTX CHG 51 base

• **Installing the T FTX RBA T5 battery unit**

- 1 Position the T FTX RBA T5 battery unit on the T FTX CHG 51 battery charger base. Lock it into place using the screw at the top.



- 2 Plug in the connector,



**Warning**

For safety reasons, installation of the battery back-up extension must be carried out with the cell controller power cord unplugged and the power switch in the Off position.

---

## 4.5 24 VDC Supply Adaptor

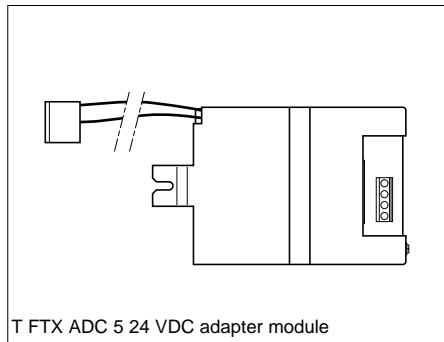
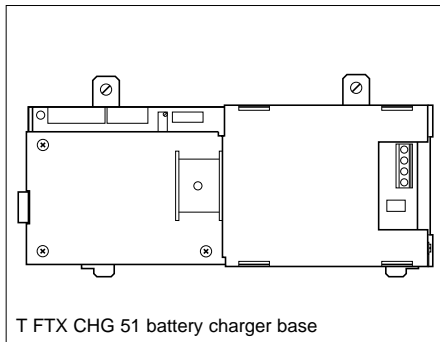
---

### 4.5-1 Presentation

The cell controllers can be supplied from an industrial 24 VDC supply. Operation is guaranteed for voltages varying from 19.2 to 30V (including ripple).

The 24 VDC supply requires two elements:

- A T FTX CHG 51, battery charger/24 VDC power supply base unit for mounting on the cell controller chassis, once the back cover is removed for access,
- A T FTX ADC 5, 24 VDC adapter module for mounting on the charger base unit.

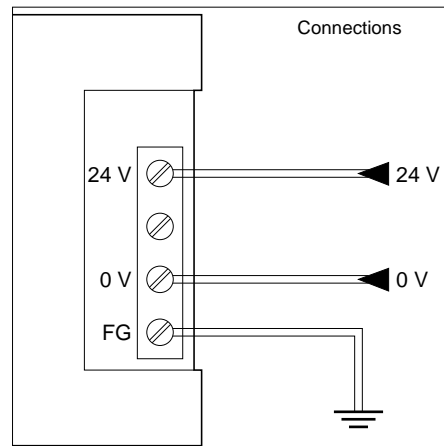


The T FTX CHG 51 battery charger base and T FTX ADC 5 adapter module together enable the cell controller to operate from an external 24 VDC industrial supply. This can be used as a back-up power source when an AC mains supply is used. It comprises a device for monitoring the voltage level on the mains supply being used (with the battery charger inactive).

The power supply is protected by a 5 x 20 5A TD fuse.

### Important

Connecting the 24 VDC line to the cell controller means that the 0V level is directly connected to the terminal chassis (FG).

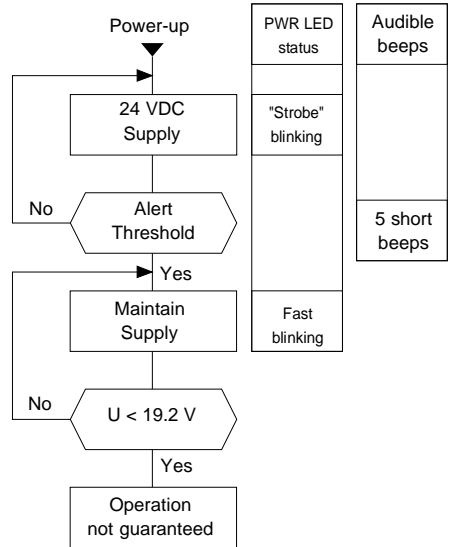


### 4.5-2 Operation

#### Threshold alarm

Corresponds to the detection threshold ( $U = 22.5V$ ).

If the voltage level rises above the 22.5 V threshold during the trickle charge phase, the terminal is automatically reset to the preceding state.



### 4.5-3 Installation Procedure

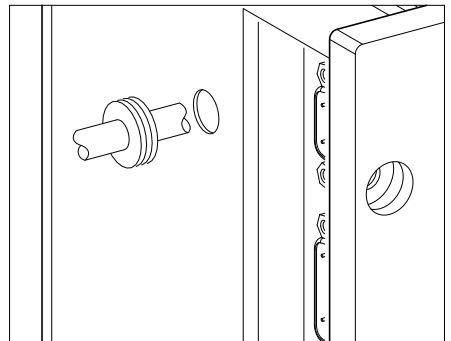
#### Warning

For safety reasons, installation of the battery back-up extension must be carried out with the cell controller power cord unplugged and the power switch in the Off position.

The installation and connection procedure is identical to that described in Sub-section 4.4-4, the T FTX ADC 5 adapter being fitted in place of the T FTX RBA T5 battery cartridge.

To connect the 24 VDC supply cable, perform the following operations:

- Fit the grommet supplied with the terminal.
- Slide the cable through it.



---

---

## **5.1 Introduction to the Utilities**

---

### **5.1-1 General**

Telemecanique software utilities function under DOS (or in the OS/2 DOS compatibility box). They are divided into two groups:

- A SETUP program resident in ROM, displays the configuration parameters for the cell controllers and allows them to be altered. This software is in English only.
- A set of utilities supplied on a 3 1/2" diskette (reference T FTX LF TDS 5) containing the following:
  - SETUP.EXE, described in Sub-section 5.2, displays the configuration parameters for the cell controllers and allows them to be altered. This SETUP program performs the same functions as the one resident in ROM, but it is a multilingual version (French, English, German, Italian, Spanish).
  - VALIDWDG.EXE, described in Sub-section 5.3 activates the cell controller watch-dog.
  - CMOS.EXE, described in Sub-section 5.4, backs up files to the cell controllers' CMOS RAM memory.

---

### 5.1-2 Installation Procedure

Under DOS (or in the OS/2 window), when the prompt appears on the screen, it is necessary to:

- Insert the utilities diskette into a drive,
- Select the drive identifier where the diskette is located by typing, for example, A :  
The prompt A:\> is then displayed,
- Commence the utilities installation procedure by typing the command INSTALL then press <Enter> to validate.

The following message is then displayed:

```
Installation of TELEMECANIQUE utilities in progress...
```

The program creates the C:\TE\_TOOLS directory, stores the SETUP.EXE, VALIDWDG.EXE and CMOS.EXE utilities there, then changes the AUTOEXEC.BAT start-up file.

Once the installation is complete, the following message is displayed:

```
Installation of TELEMECANIQUE utilities is now complete. Remove the  
diskette and press Control-Alt-Del to restart.
```



---

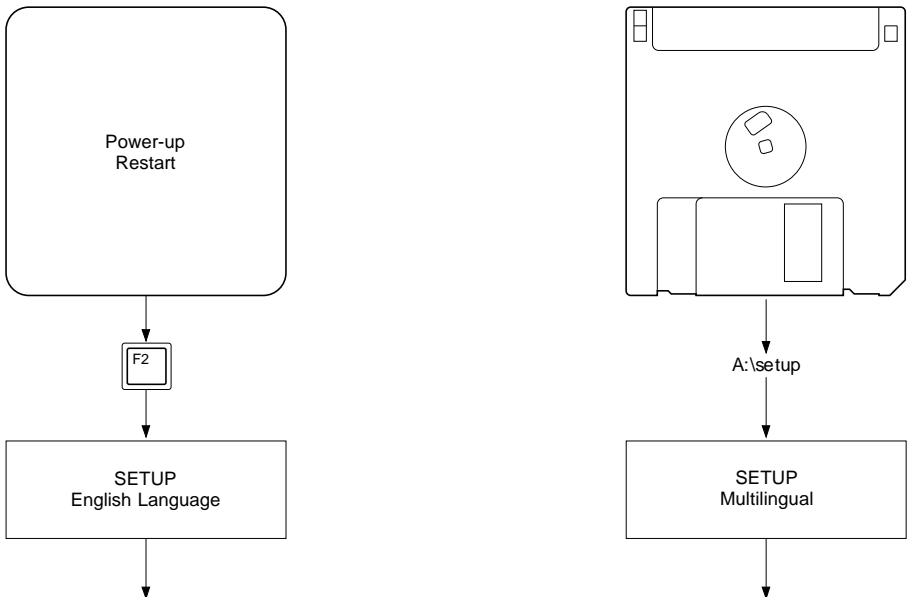
## 5.2 Configuration Utility (SETUP)

---

### 5.2-1 Accessing SETUP

SETUP may be accessed in one of two ways:

- By keeping F2 pressed down during the self-tests when the cell controllers are powered-up or rebooted. This method of access starts the SETUP program in the ROM memory. This version is in English only.
- Under DOS or in an OS/2 session by opening the DOS compatibility window, and running the SETUP.EXE file supplied on the T FTX LF TDS 5 Utilities diskette. This version is multilingual (French, English, German, Italian, Spanish).



When SETUP is started using the F2 key, the message **\*\*RESIDENT SETUP ACTIVATED\*\*** is displayed at the bottom of the screen.

If the terminal is already powered up, SETUP can be accessed by pressing F2 and then entering the password, if one is configured.

## 5.2-2 Screen Presentation

The standard configuration screen is described below (some parameters may vary, depending on the hardware configuration):

TELEMECANIQUE C CX 77 CONFIGURATION Version x.y	
BASIC CONFIGURATION	OPERATING CONFIGURATION
Memory Size : 8192 Kb CMOS RAM Size : 128 Kb Drive A : 1,44 Mb Hard Disk : 233 Mb Video Interface : UGA Math Coprocessor : Present Serial Ports : 02 Parallel Ports : 01 Language : English	Operating Parameters Communication Ports Select Front Keyboard language Language Selection
Bios Version : U x.y Serial Number : 21222363	
Cursor Key : ↑, ↓, →, ← Select : Enter Exit : ESC Help : F1	

This screen has two windows:

- A BASIC CONFIGURATION window indicating accessories which are set-up. The parameters in this window cannot be modified,
- An OPERATING CONFIGURATION window which is used to modify the dynamic parameters of the cell controller:
  - Date, time, password, etc.
  - Assignment of communication ports,
  - Configuration of front panel keypad,
  - Language selection: determining the language used by all the Telemecanique utilities.

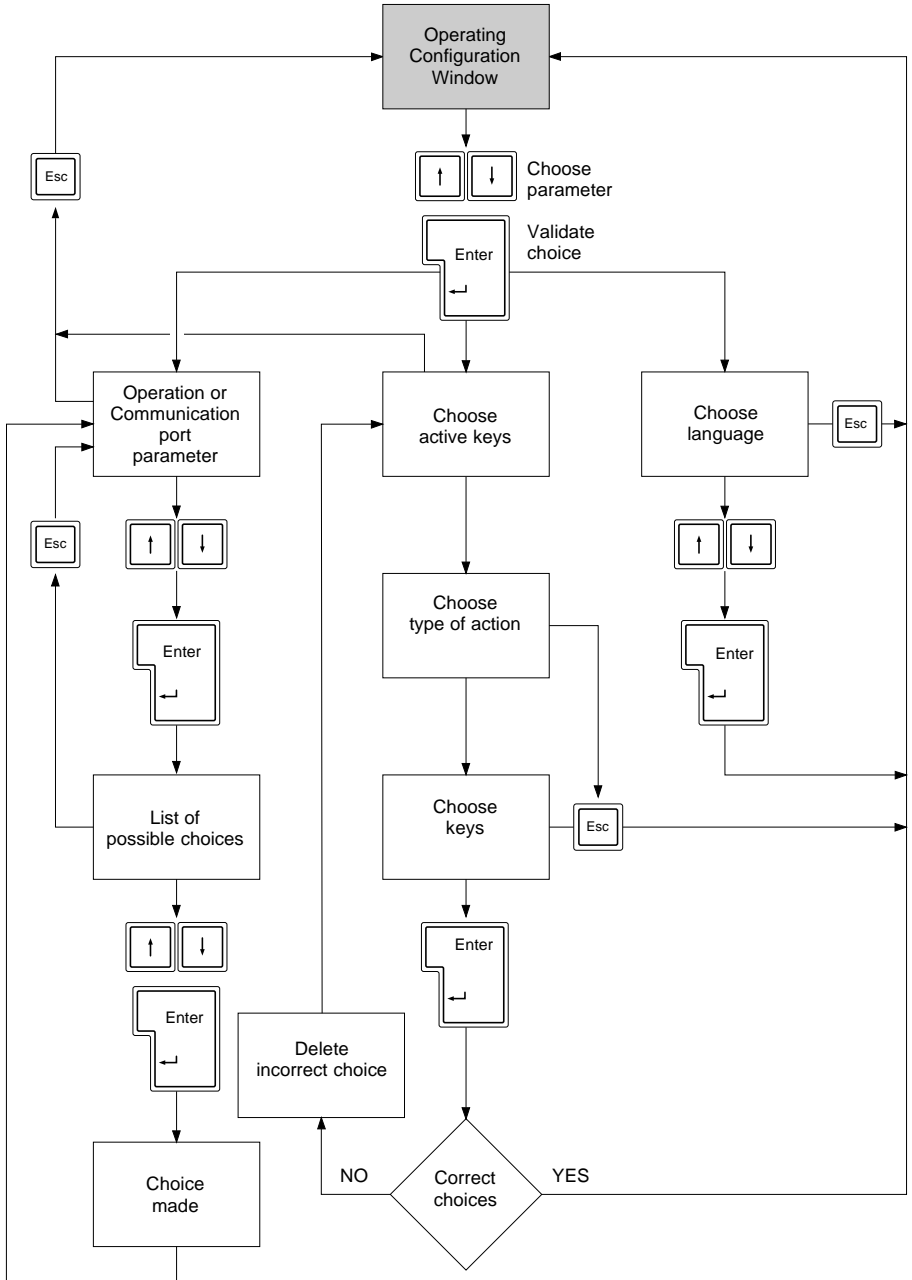
### Keys to use

The two windows are accessed by the ← and → keys. The Cursor Up and Cursor Down keys are used to select the parameters within these windows.

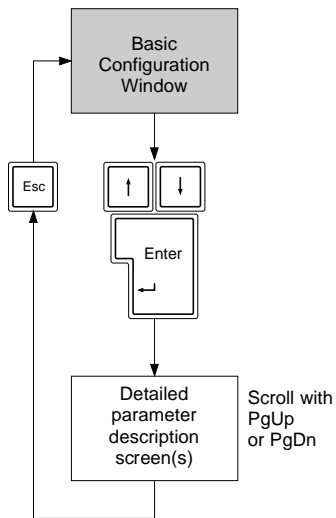
The <Esc> key is used to exit either from the current function or from SETUP.

F1, which can be pressed at any time, accesses a context related help file corresponding to the screen displayed and the item selected.

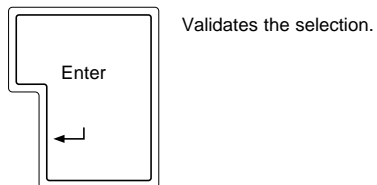
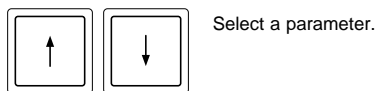
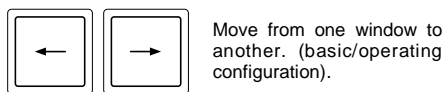
5.2-3 Operation Overview



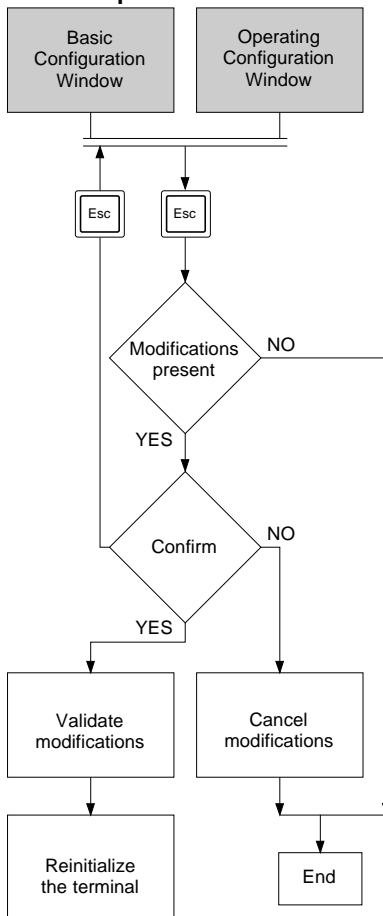
## Operation overview (continued)



## Key markings



## Principle of confirmation



### 5.2-4 BASIC CONFIGURATION Window

The BASIC CONFIGURATION window provides information on the hardware configuration of the cell controllers:

- Size of the RAM memory,
- Size of the CMOS RAM memory,
- Diskette drive A,
- Hard disk,
- Video interface,
- Math coprocessor,
- Serial ports,
- Parallel ports,
- Dialog display language for this utility.

BASIC CONFIGURATION	
Memory Size	: 8192 Kb
CMOS RAM Size	: 128 Kb
Drive A	: 1,44 Mb
Hard Disk	: 233 Mb
Video Interface	: UGA
Math Coprocessor	: Present
Serial Ports	: 02
Parallel Ports	: 01
Language	: English
Bios Version	: U x.y
Serial Number	: 21222363

A detailed description of any parameter in this window can be obtained by selecting the parameter and then pressing <Enter>, providing it has been configured.

#### Memory Size

Gives the total size of the RAM memory, as well as the distribution between memory installed on the system board and on a PC-AT (ISA bus) extension card.

#### CMOS RAM Size

Gives the size of the CMOS RAM memory built into the cell controllers. This is a permanent memory for storing small files using CMOS.EXE on the utilities diskette reference T FTX LF TDS 5 (further information is given in Sub-section 5.4).

---

**Drive A**

Gives the capacity of the disk drive installed.

**Hard Disk**

Gives the capacity of the hard disk.

**Video Interface**

Gives the type of video interface.

**Math Coprocessor**

Shows whether the optional math coprocessor is installed.

**Serial Ports**

Gives the number of serial ports available and validated in the cell controller.

**Parallel Ports**

Gives the number of parallel ports in the cell controller.

**Language**

Gives the language used by all Telemecanique utilities.

**Bios Version**

Gives the Bios version installed in the cell controller.

**Serial Number**

Gives the serial number of the cell controller. This number is unique. It cannot be changed.

### 5.2-5 OPERATING CONFIGURATION Window (Operating Parameters)

The "Operating Parameters" selection in the OPERATING CONFIGURATION window is used to modify the following functions:

- Date,
- Time,
- Assignment of ALarm Flag output ALF0,
- Assignment of ALarm Flag output ALF1,
- Password selection,
- Type of self-test execution on power-up,
- Status of the CMOS RAM,
- Optional back-up power supply operation.

Screen example:

OPERATING PARAMETERS	CAUTION !!!!
Date . . . . . 06/04/94	<p>The selections made by the user for the message display language, the time and date and the display settings take effect immediately.</p> <p>All other selections will only take effect when the CCX 77 is rebooted.</p>
Time . . . . . 16:50:12	
Processor speed . . . Normal	
ALF0 digital output . User defined	
ALF1 digital output . User defined	
Password . . . . . Absent	
Self-tests . . . . . Quick	
CMOS RAM Status . . . Checksum correct	
Optional Power supply Battery (Continuous)	

#### Important

The modified parameters, displayed in reverse video, only take effect after exiting SETUP. Data relating to the time and date take effect immediately.

When a parameter is selected, a data entry window provides various choices or indicates the syntax to be used.

---

## Date

Updates the date in the format shown.

## Time

Updates the time in the format shown.

## ALF0 digital output

The ALF0 digital output can be configured in two ways:

- User defined:  
It can be controlled by program, independently of the state of the system,
- Watchdog:  
It is configured so that an internal watchdog activates it if a serious fault occurs. The watchdog should then be activated by a program installed in the AUTOEXEC.BAT start-up file (refer to Sub-section 5.3).

## ALF1 digital output

The ALF1 digital output can be configured in three ways:

- User defined:  
It can be controlled by program independently of the state of the system,
- Temperature alarm:  
It is activated on detection of an excessive temperature level inside the cell controller,
- Low battery:  
It is activated when the cell controller is operating on battery back-up with a battery which is down to 10% or less of its capacity.

## Password

This function defines (or cancels) a password of 3 to 8 alphanumeric characters. Once confirmed, the password is requested each time the cell controller is powered-up. After three unsuccessful attempts to enter the correct password, the cell controller must be powered-up again.

- Defining a password:  
When no password is defined for the cell controller, type the selected password twice in succession.
- Modifying the password:  
Type the old password and then type in the new one twice in succession.
- Deleting the password:  
Type the old password, then press <Enter> twice.



If the user loses the password, contact Telemecanique support and have the following information ready:

- System location.
- The information that is displayed on-screen after three unsuccessful attempts to enter the password when powering-up the system:
  - Serial number,
  - Random code number.

Telemecanique will provide a specific code for reinitializing the cell controllers and defining a new password. This specific code will not work if it is entered at a later date if the password is lost again.

### **Important**

The password system makes use of the positions of the keys used and not their labels. Therefore it is strongly recommended to avoid changing the type of keyboard after defining a password (e.g. the password "ZAQ" on a French keyboard corresponds to "WQA" on a UK/US-English keyboard). It is also necessary that the same keyboard should always be used to give, modify or define the password (for example, the built-in keypad or the external keyboard).

### **Self-tests**

This parameter selects the way the self-tests are carried out when the cell controllers are powered-up:

- Complete:  
Tests the entire RAM memory,
- Quick:  
Only tests the basic memory (640 Kb) and the system memory (384 Kb). This saves a great deal of time when running self-tests on a cell controller with a large amount of installed RAM memory.

### **CMOS RAM status**

Once confirmed, this function initializes the contents of the CMOS RAM memory in the event of an incorrect checksum.

An incorrect checksum indicates that at least one of the files in this memory is damaged. The CMOS.EXE utility on the T FTX LF TDS 5 Utilities diskette handles the files contained in CMOS RAM memory. See Sub-section 5.4 for more information on this utility.

---

## Optional Power Supply operating modes

### Battery

The T FTX RBA T 5 battery back-up lets the cell controllers operate without an AC supply. The operating time on battery back-up can be selected from the following options:

- **Battery (continuous):**  
If there is a power break, the system automatically switches to the battery back-up. An audible alarm is sounded. The time available for independent operation depends on the operating mode of the cell controller and the extension boards installed. A second signal indicates that the battery is 90% discharged.
- **Battery (disabled):**  
If there is a power break, independent operation will continue for between 20 and 60 ms, depending on the hardware configuration of the cell controller. In this mode, the cell controllers can be powered-up without access to an external power supply. The self-tests then request user confirmation of power-up by pressing any key. If there is no confirmation, the terminal is automatically shut-down to conserve the battery.
- **Time limited:**  
If a power break occurs, the battery back-up is used for the period specified (up to 20 minutes). After this time, the cell controllers shut down. One minute before the end of the set time, an audible alarm sounds. If AC power returns during battery powered operation, a long beep is sounded and the battery goes back on charge.

**Note:** This option is not available when starting-up directly off the battery.

### 5.2-6 OPERATING CONFIGURATION Window (Communication Ports)

Selecting "Communication Ports" from the OPERATING CONFIGURATION window, lets the user modify the assignment of the different kinds of data link:

- RS 232 C
- RS 485 / CL20 (20 mA current loop)
- Parallel //

to the various communication ports available to the system:

- COM1
- COM2
- COM3
- COM4
- LPT1
- LPT2

COMMUNICATION PORTS
<p>Assignment of the built in ports :</p> <ul style="list-style-type: none"> <li>- RS 232 c . . . . . COM1 (default)</li> <li>- RS 485 / CL20 (PLC). . . . COM2 (default)</li> <li>- Parallel port address. . . 378h (default)</li> </ul> <p>Communication mode selected for the RS485/CL20 (PLC) communication port :</p> <ul style="list-style-type: none"> <li>- Selected mode. . . . . CL20</li> </ul>

ASSIGNMENTS		
Port	Address	Int
COM1	3F8	IRQ4
COM2	2F8	IRQ3
COM3	3E8	IRQ4
COM4	2E8	IRQ3

Mounted on the system motherboard, the cell controllers comprise the following ports:

- Two serial ports:
  - One RS 232C port, designated COM1 by default,
  - One port designated COM2, for interfacing with Telemecanique PLCs:
    - Configured as an RS-485 serial port for connecting to a UNI-TELWAY bus,
    - Configured for current loop operation (CL 20) for connecting to the terminal port on other Series 7 PLCs.
- One parallel port, designated LPT1 by default.

If necessary, additional communication ports can be installed on the ISA bus.

---

## Important

Modified parameters, shown in reverse video, only take effect after exiting SETUP. A high numbered communication port may only be selected if lower numbered ports are also used (e.g. if COM3 is declared, COM1 and COM2 must already be used).

When selecting a parameter, an entry window shows the possible choices available.

### **RS 232 C**

Designates serial port COM1 (selected by default) or COM3 as RS 232C data links. It is also possible not to assign an RS 232C port (selection inhibited).

### **RS 485 / CL 20 (PLC)**

Designates serial port COM2 (selected by default) or COM4 as an RS 485 or CL 20 data link.

It is also possible not to assign this port (selection inhibited).

### **Parallel port address**

Designates parallel port LPT1 (selected by default) or LPT2 as a parallel data link.

It is also possible not to assign a parallel port (selection inhibited).

### **Note**

Parallel port LPT1 must be declared in order to use MONITOR 77 supervision software or X-TEL or MINI X-TEL software workshops.

### **Selected mode**

The Telemecanique PLC port (RS 485 / CL 20), when it is not inhibited, can be programmed for two communication formats:

- RS 485 for connecting to a UNI-TELWAY bus,
- Current Loop (CL 20) for connection to the programming port of series 7 PLCs.

---

### 5.2-7 OPERATING CONFIGURATION Window (Front Keypad Language)

This choice enables the internal keyboard language (front keypad) to be adapted to the external keyboard language which is configured when the operating systems are installed. If this operation is not carried out, some keys will not correspond to their labels.

Keyboard layouts available include American, French, German, Italian, Spanish, English and Swedish.

#### Screen

SELECTION FRONT KEYBOARD LANGUAGE	
This selection is required for the good operation of the front keyboard. The selection must be the same as the keyboard choice for the operating system(s).	
US	: United States
FR	: FRan ais
GR	: GeRmany
IT	: ITaly
SP	: SPain
UK	: United Kingdom
SU	: Swedish

---

### 5.2-8 OPERATING CONFIGURATION Window (Language Selection)

The language selection option in the OPERATING CONFIGURATION window lets the user select the language to use when executing Telemecanique utilities. The languages available include English, French, German, Italian and Spanish.

#### Screen

LANGUAGE SELECTION
English : Select the country Fran ais : S lectionner la nationalit Deutsch : Wahlen Sie die Nationalitat Italiano : Selezionare la nazionalit Espanol : Selectar la nacionalidad

Any modification to the language selection takes effect immediately.

**Reminder:** The SETUP program resident in ROM in the cell controllers is an exception. It is in English only.

---

### 5.2-9 Saving the Modifications

Once the modifications have been entered, they must be saved.

This is carried out using the basic SETUP screen, by pressing the following key sequence:

**<Esc>**: displays a confirmation screen:

- **<Y>** confirms the modifications, exits from SETUP and places the terminal in its normal operating mode.
- **<N>** cancels the modifications which were made and exits SETUP,
- **<Esc>** returns to the parameter selection display.

---

### 5.3 Utility for Activating the Watchdog

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The following command enables the internal watchdog to be activated which triggers the ALF0 output (refer to Sub-section 5.2-5).

The configuration must assign the ALF0 output to the watchdog in the "operating parameters" window of SETUP.

#### **VALIDWDG**

Validates the watchdog. When the cell controller is restarted, the watchdog is disabled.

---

### 5.4 Utility for Saving Files to CMOS Memory

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The following commands are used to read and write files to and from the CMOS RAM memory.

#### **CMOS**

Lists all the commands described below.

#### **CMOS PUT <dosname> [<cmosname>]**

Copies the file named (with its path) into the CMOS memory.

E.g.: C:\TE\_TOOLS>CMOS PUT C:\PROJECT\OVEN.CAB OVEN.CAB

#### **CMOS GET <cmosname> [<dosname>]**

Copies the file from the CMOS memory into the file named (with its path).

E.g.: C:\TE\_TOOLS>CMOS GET OVEN.CAB C:\PROJECT\OVEN.CAB

#### **CMOS DEL [<cmosname>]**

Deletes the file named from the CMOS memory.

E.g.: C:\TE\_TOOLS>CMOS DEL OVEN.CAB

#### **CMOS DIR**

Lists the files stored in CMOS memory and gives the amount of memory space still free.

#### **CMOS DEL \*.\***

Deletes all the files from the CMOS memory.





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## 6.1 Presentation of OS/2 Utilities

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The contents of the OS/2 utilities diskette should only be installed on cell controllers used with the OS/2 version 2.x operating system.

The TE/MS-OS/2 1.3 operating system already contains the additional functions provided by these utilities.

These utilities are designed to complete the IBM version of OS/2 by adding features that are specific to Telemecanique systems.

The contents of the utilities diskette must be installed PRIOR to proceeding with the installation of the Software Workshop (X-TEL or MINI X-TEL).

**Note:**

If the terminal is supplied ready to run with pre-installed software, the contents of this diskette is already factory installed. No additional actions are therefore required.

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## 6.2 Installation Procedure

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The OS/2 operating system must be installed PRIOR to installing the contents of the utilities diskette. Refer to the manual provided with the OS/2 diskettes for information on how to perform the installation.

Then install the utilities:

- Start-up the system under OS/2 ;
- Do not start any other application as the terminal will have to restart to take into account the driver added by the installation procedure;
- Open an OS/2 session using the following commands:
  - From the desktop, select the OS/2 icon (by double-clicking on it);
  - From the "OS/2 - Icons" window, select the "Guest" icon;
  - From the "Guest" window, select the "OS/2 Full Screen" window;
- Insert the "TE OS/2 TOOLS" diskette into drive A.;
- Start the installation by typing the command:  
**a:INSTALL** then press <Enter> to confirm
- When prompted by the program, restart the system by pressing <Ctrl> <Alt> <Del>.



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## 7.1 General

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Each time the cell controllers are powered-up or restarted, a self-test sequence is automatically performed (refer to Sub-section 2.2). If one of the tests fails, an error message is displayed on-screen (refer to Sub-sections 2.2-3 to 2.2-6).

Depending on the type of message, the user should:

- Take the appropriate corrective action (correct the configuration, replace a defective battery, etc.), or
- Contact Telemecanique support.

The user can only replace the following cell controller parts:

- Internal parts
  - 4 or 8 Mbyte dynamic RAM modules,
  - Extension boards
  - Battery charger unit
  - 24 VDC adaptor
  - Battery for real-time clock and CMOS RAM back-up
  - Power supply fuses.
- External parts
  - External keyboard
  - Power cord
  - Mouse
  - Cell controller/PLC or network connection cables.

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## 7.2 User Replaceable Parts

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The procedure for replacing selected internal elements is identical to that for installing them.

### Relevant parts:

- Dynamic RAM, refer to Sub-section 4.2,
- Extension boards, refer to Sub-section 4.3,
- Battery charger unit, refer to Sub-section 4.4,
- 24 VDC supply unit, refer to Sub-section 4.5.

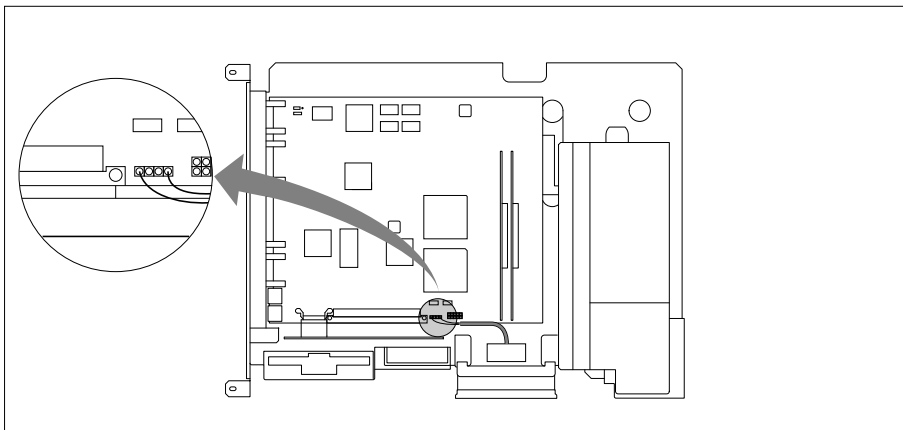
For other parts, refer to the following sub-sections.

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### 7.2-1 Real-Time Clock Back-up Battery T FTX BAT 51

Replacement procedure:

- Remove the back panel of the cell controller (refer to Sub-section 4.1-1),
- Access the motherboard (refer to Sub-section 4.1-2),
- Disconnect the battery,
- Remove the battery from the chassis (it is held in place by on the chassis, at fan level, by a Velcro strip),
- Install the new battery and repeat the above procedure in reverse order to re-assemble.

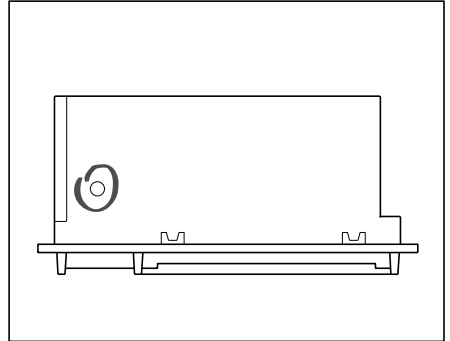


After replacing the battery, ensure that the new battery is connected as quickly as possible (less than five minutes) after removing the old one to avoid loss of CMOS RAM and SETUP data.

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### 7.2-2 AC Power Supply Fuse

The AC power supply comprises a fuse (TD 20x5 2A) located at the bottom of the cell controller.



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### 7.2-3 DC Power Supply Fuse

If the cell controller is fitted with the internal 24 VDC adapter unit (T FTX ADC 5), a fuse (TD 20x5 5A) protects the power supply.

This fuse is located in the battery charger/24 VDC supply unit (T FTX CHG 51) and is accessible once the back panel cover is removed (refer to Sub-section 4.1-1).

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## 8.1 General

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The cell controllers have been developed to conform to the main national and international standards concerning industrial control systems and electronic equipment:

- Specific to programmable controllers: functional characteristics, immunity, durability, safety, etc. CSA 22.2 n°142/UL 508,
- Immunity to electrostatic discharges: CEI 801.2 Level 4,
- Isolation coordination: air and leakage distances: UL 508, NFC 20-040, IFC 1131-2, etc.

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## 8.2 Service Conditions

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### 8.2-1 Temperature

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#### Normal temperature conditions

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$\theta_A$ operation	0°C to + 40°C
$\theta_A$ storage	-25°C to + 60°C

$\theta_A$ : temperature of surrounding air

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### 8.2-2 Relative Humidity

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#### Normal conditions

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Relative humidity (without condensation)	30% to 95%
Altitude	0 to 3000 meters

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### 8.2-3 Power Supplies

<b>Nominal Voltage</b>	<b>24 VDC</b>	<b>110/127 VAC</b>	<b>220/240 VAC</b>
Operating range	19.2 to 30 V	90 to 140 V	180 to 260 V
Frequency limits	-	47 to 63 Hz	47 to 63 Hz
Micro-power breaks	duration	20 ms	20 ms
(typically)	repetition	1 Hz	1 Hz
Total harmonic distortion	-	10 %	10 %
Residual ripple	5% of Un	-	-

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### 8.2-4 Equipment Sealing

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#### Normal conditions

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Front panel	IP 65
Other panels	IP 20

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#### Reminder

Cell controllers must be installed in enclosures or control panels with a protection level of at least IP 54.