CET s.r.l.

Operator Panels

HPT- IPT - IPG

Technical Reference Manual

HPT124 HPT128P HPT284
IPT102 IPT104 IPT202 IPT204
IPG106 IPG208 IPG240

1.63 Version

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1. GENERAL DESCRIPTION

1.1. PANEL FEATURES

The Operator Panels **IPT- PG SERIES** are instruments which enable the operator to display, edit and modify the **PLC** settings (programmable logic controller).
They are equipped with display of different forms and features, on which **messages, variables** or **graphic images** are displayed and with a keyboard to modify variables or carry out commands.

1.2. PANEL PERFORMANCE

The below-listed features are common to all the panels. Further, specific features will be outlined according to the Kind of O.P.

The common features are:

- Diaphragm Keyboard with description strips on the function keys.
- Red Leds on all the function keys and on the Led “Error”.
- Green Leds on all the function keys and on the Led “Line”.
- Software selection of all kinds of serial interface towards the PLC.
- Display, editing and preset of the PLC settings in all formats.
- Control menu of all the main features.
- 1300 (for the 40x2 display) Pages stored in 128 Kbyte Flash Memory.
- 1050 Total Features (32 per Page and 256 per Function Key).
- Display Pages for Messages, Help, Alarms, Graphics.
- Display Pages to change the settings of the PLC.
- Variables in decimal, hexadecimal, binary, bcd, signed, string, positional, histogram and clock-bit format.
- Clock and date (not on HPT).
- Management of 100 recipes for 100 ingredients for 100 sets of parameters.
- 254 Alarms connected to events read in the PLC.
- ALARM WARNING line driven by the INFO key.
- Alarm storage and print even in immediate mode.
- Function Keys programmable as Slave Keys.
- Graphic background with bitmap images (only for IPG series Panels).
- Seven kinds of Font plus a personalized one and reverse use available (only for IPG series Panels).
- Service messages on multi-lingual O.P., which can be selected from the menu.
- Real-time clock and date feature on O.P., which can be read by the PLC (not available for HPT).
- Password on the Function Keys and on the fields in “Modify” mode.
- Semigraphic characters (only for IPG series Panels).
- Acoustic Signal.
- Software Adjustment of the LCD display sharpness (not on HPT).

1.3. PANEL PROGRAMMING

The Operator Panels **IPT- IPG SERIES** should be programmed for the correct communication with the PLC.
Programming is carried out via the programming software package CETPRO 3, connected to the Personal Computer through the relevant cable.

During the transfer, messages, graphics features and software protocol are loaded to communicate with the **PLC,** you wish to work with; each panel can therefore work with any PLC and the kind of loaded protocol, automatically selects the serial interface. The specific cable then allows the specific connection.
The Panel is completely configurated via software; therefore no internal or external bond exist.

The Panel programming can take place only in the "**OFF-LINE**" status.

The Key  enables the Panel to programme. The display shows the following:

PROGRAMMING
WAIT

All the programming options are selected on the PC through the programming software "**CETPRO 3**" which transfers the data to the Panel.
Before programming the Panel take care that the **BAUD-RATE** is correct (the same between PC and P.O.), and that the cable is connecting the O.P. port and that on the PC (**COM 1 or COM 2**). If the programming is successful, the display will show the following:

PROGRAMMING
WAIT

During the data transfer from PC to O.P. the green Led **"LINE"** flashes.

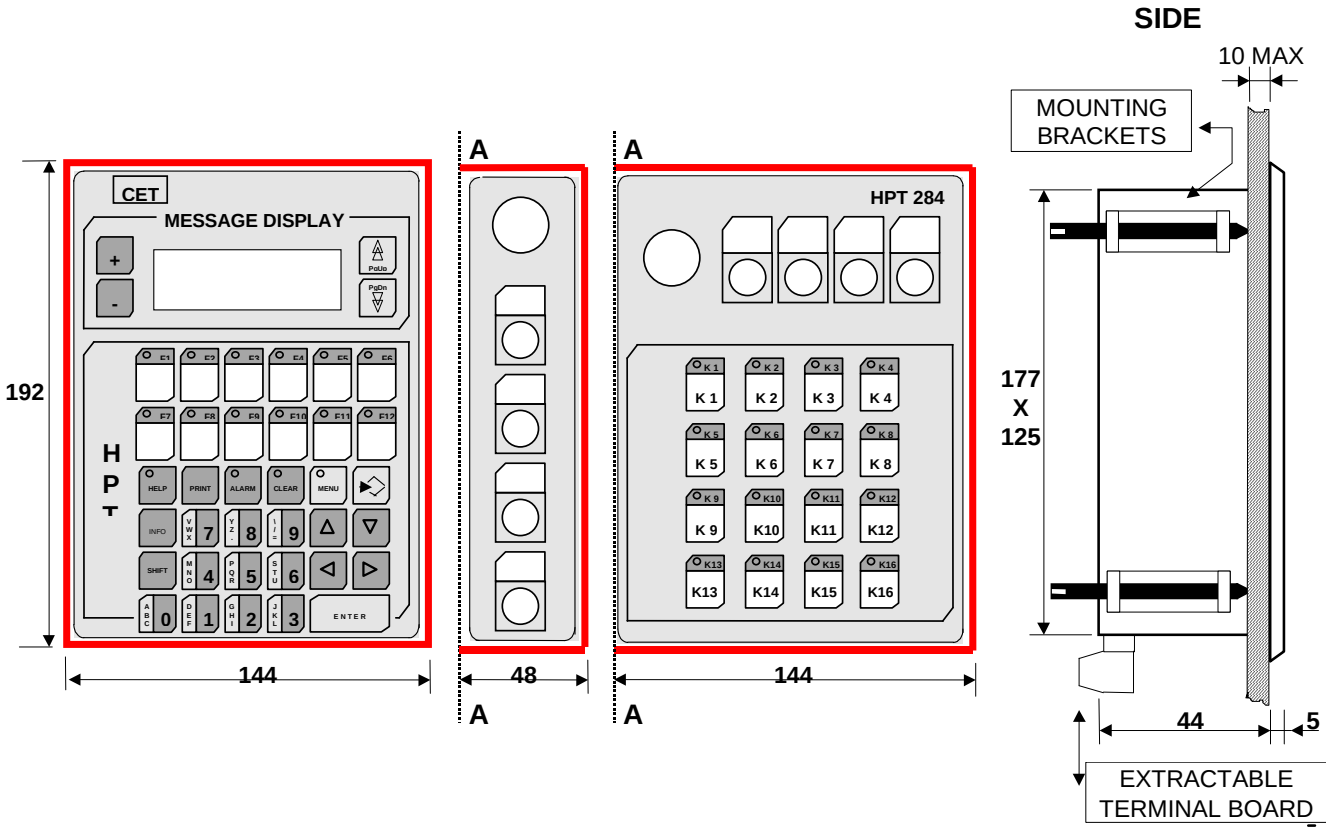
1.4. SUPPORTED PLCs

The supported **PLCs** with specific protocol loaded on the O.P. through "CETPRO 3" are:

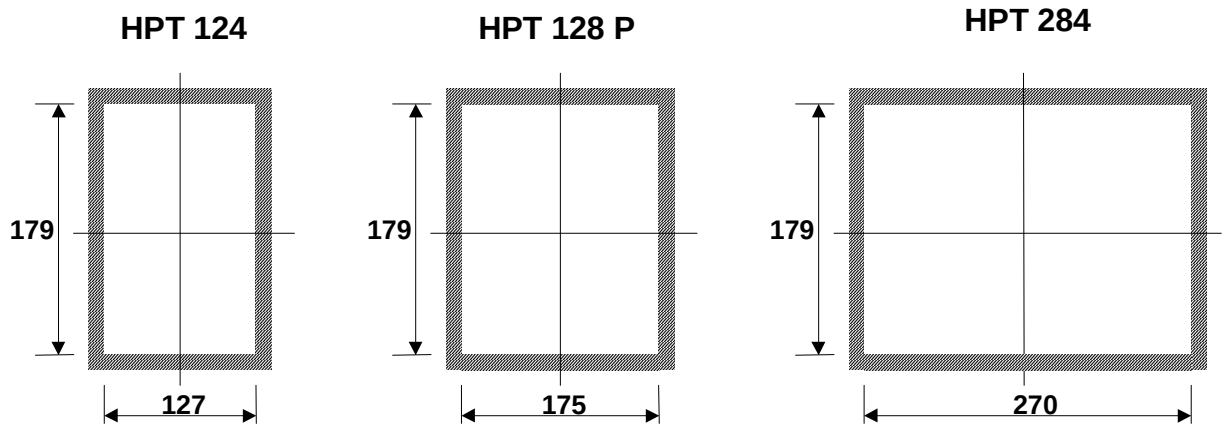
⇒ PLC ABB : PROCONTIC CS31
⇒ PLC AEG : MICRO 311 / 411 / 511 / A984-131
⇒ PLC ALLEN BRADLEY : SLC 5/03 - 5/60 - MICROLOGIC
⇒ PLC CGE : 90 / 30 - CMM311 SERIES
⇒ PLC CROUZET : RPX 10 / RPX 20 / RPX30 PROGRAMMING PORT
⇒ PLC HITACHI : H200
⇒ PLC HITACHI : EM - EC
⇒ PLC IDEC IZUMI : FA-2J / FA-3J
⇒ PLC KEYENCE : KV
⇒ PLC KLOCKNER MOELLER: PS306/PS316
⇒ PLC MATSUSHITA : FP1-FPM (RS232) C.C.U. FP10SH
⇒ PLC MATSUSHITA : FP-M 32TC - FP1-C14
⇒ PLC MITSUBISHI : FX AxS - FX / FX0-N
⇒ PLC OMRON : C200H / C1000H / C2000H WITH LK201 SERIES
⇒ PLC OMRON : C20H / C28H / C40H CQM-1 (CPU 21E) SERIES
⇒ PLC SAIA : PGU
⇒ PLC SAIA : RS 232 PCD7.F120 INTERFACE
⇒ PLC SIEMENS : S5 - CPU 95 / 100 / 102 / 103 / 115 - 945 / 135 - 928
⇒ PLC SIEMENS : S7 200
⇒ PLC SIEMENS : S7 300
⇒ PLC TOSHIBA : PROSEC EX MODEL M20 / M40
⇒ PLC TOSHIBA : PROSEC T2

2. TECHNICAL DATA

2.1. O.P. HPT 124 - HPT 128 P - HPT 284 TECHNICAL DATA

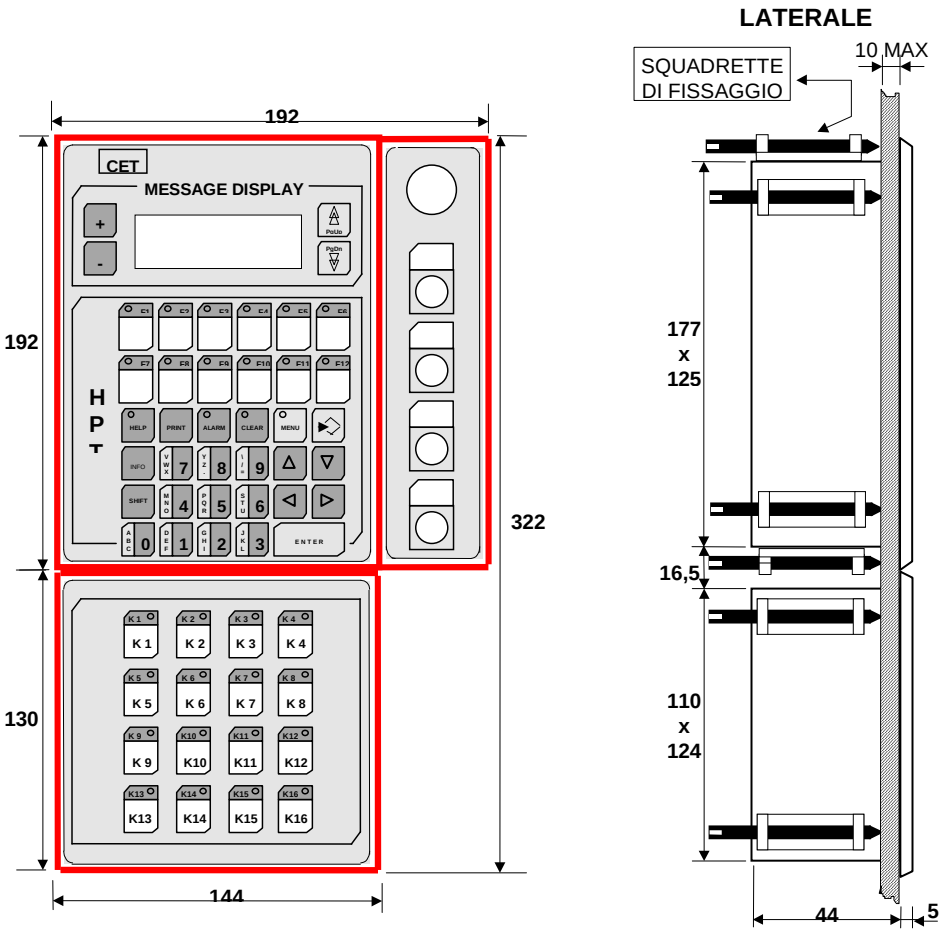


PANEL DRILLINGS



DISPLAY	: alphanumerical LCD 20 digits x 4 lines - Led backlit.
KEYBOARD	: 12 function keys with description strip per key
PROTECTION	: IP65
WEIGHT	: 800 grams / 1000 grams / 1200 grams
POWER SUPPLY	: +18 / +30 VDC shielded by a 800 mA delayed fuse
LINE VOLTAGE	: 200 mA at 24 VDC (2A/10 mSec power-up peak)
FLASH MEMORY	: 1 Mbit, for 322 pages maximum and 1050 functions
STANDARD	: CE, IEC.

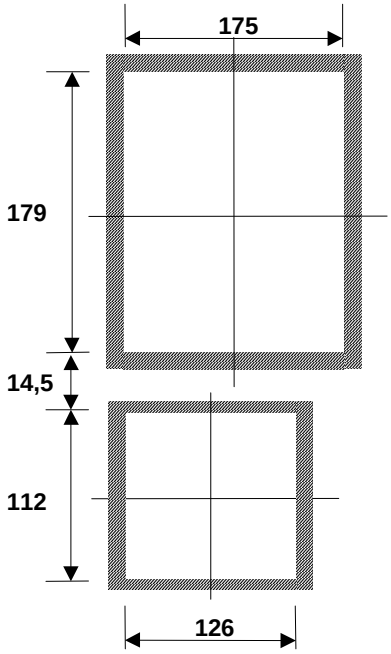
2.2. KEYBOARD EXPANSION TECHNICAL DATA - TES 16



PANEL DRILLINGS

HPT 128 P

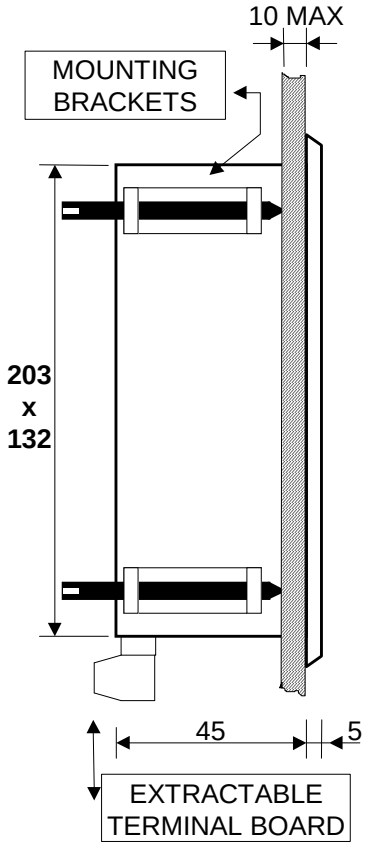
KEYBOARD EXPANSION TES 16



KEYBOARD	: 16 function keys with description strip for key
PROTECTION	: IP65
WEIGHT	: 550 grams
STANDARD	: CE, IEC.

2.3. O.P. IPT 102 - IPT 104 TECHNICAL DATA

SIDE



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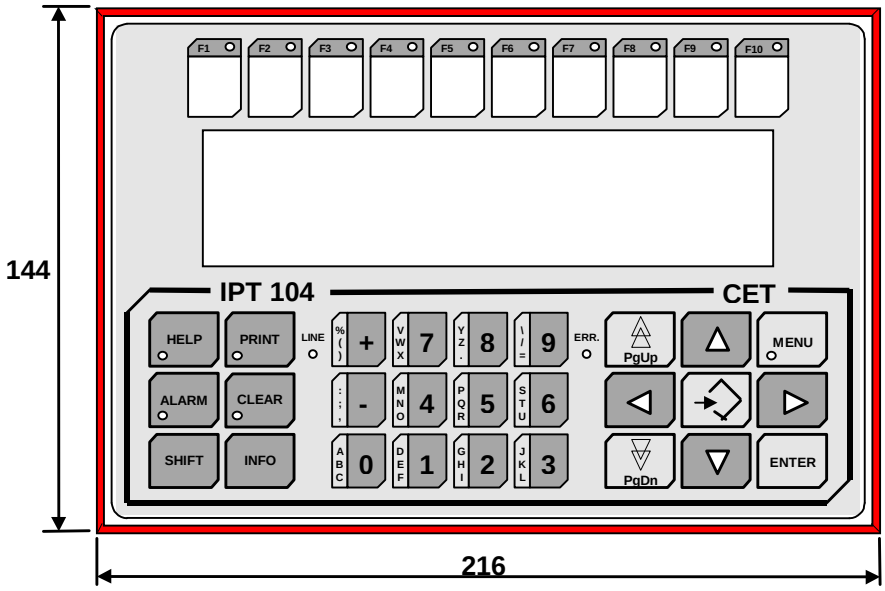
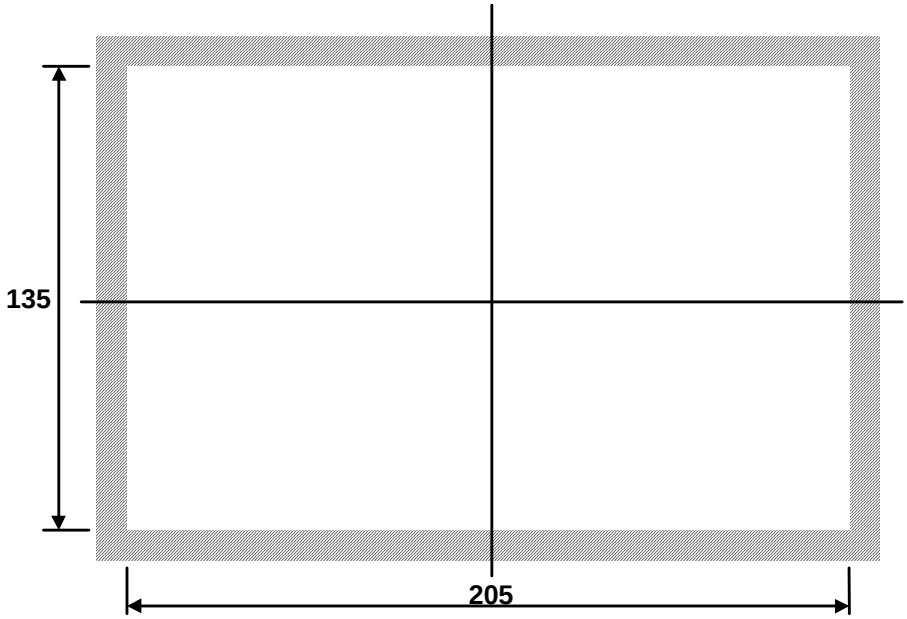


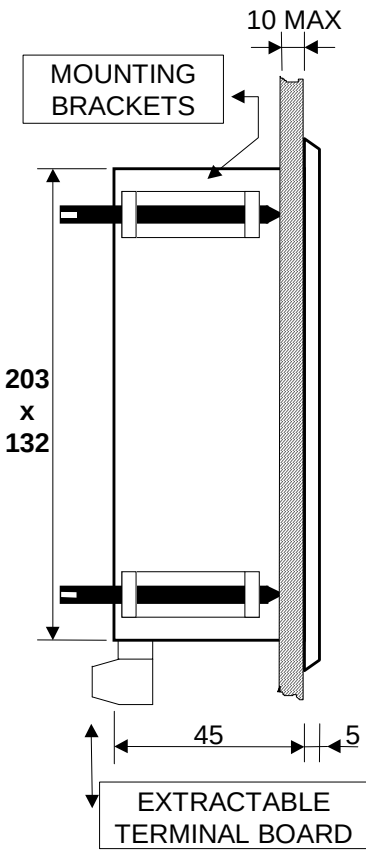
PANEL DRILLING



DISPLAY	: alphanumerical LCD 40 digits x 2 lines and 40 digits x 4 lines – Led backlit.
KEYBOARD	: 10 function keys with description strip for key
PROTECTION	: IP65
WEIGHT	: 900 grams
POWER SUPPLY	: +18 / +30 VDC shielded by a 800 mA delayed fuse
LINE VOLTAGE	: 250 mA at 24 VDC (2A/10 mSec power-up peak)
FLASH MEMORY	: 512 Kbyte per 1300/725 pages and 1050 functions
STANDARD	: CE, IEC.

2.4. O.P. IPG 106 TECHNICAL DATA

SIDE



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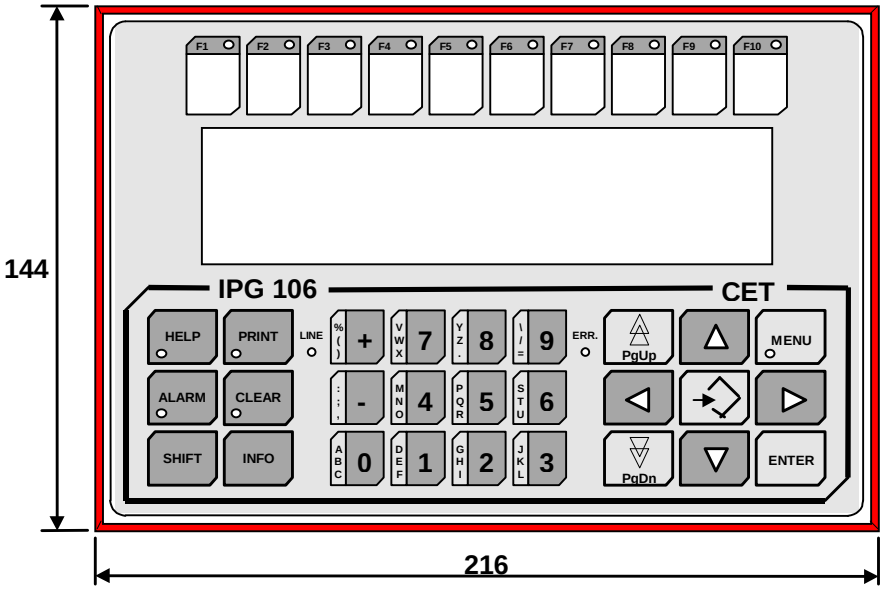
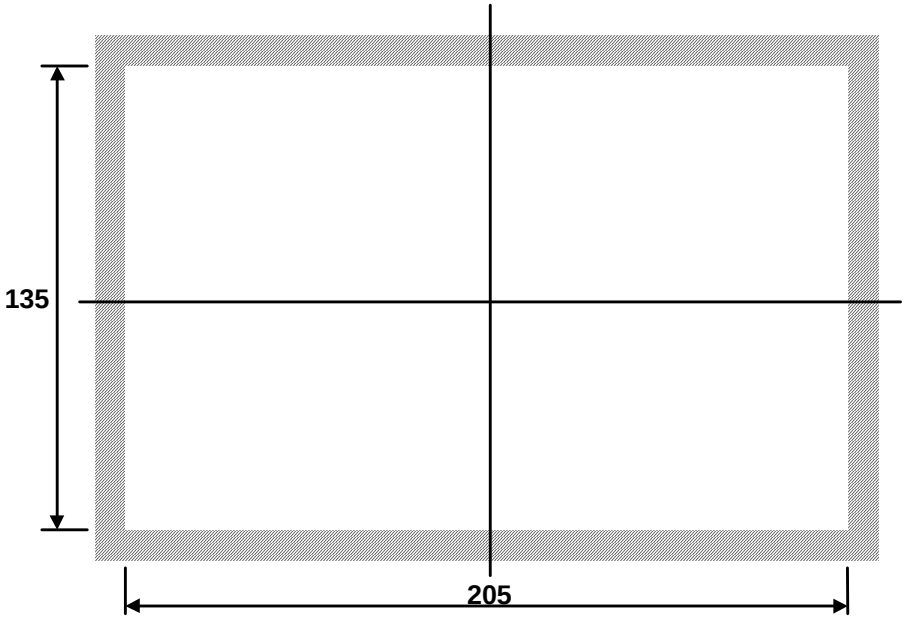


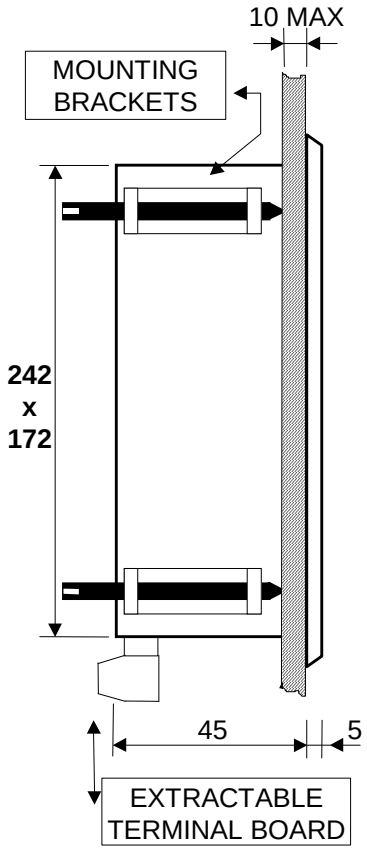
PANEL DRILLING



DISPLAY	: graphic LCD 240 x 64 pixel (30 digits x 6 lines) – Backlit with neon lamp
KEYBOARD	: 10 function keys with description strip for key
PROTECTION	: IP65
WEIGHT	: 1100 grams
POWER SUPPLY	: +18 / +30 VDC shielded with 800 mA delayed fuse
LINE VOLTAGE	: 250 mA at 24 VDC (2A/10 mSec power-up peak)
FLASH MEMORY	: 512K per 625 pages and 1050 functions
STANDARD	: CE, IEC.

2.5. O.P. IPT 202 - IPT 204 TECHNICAL DATA

SIDE



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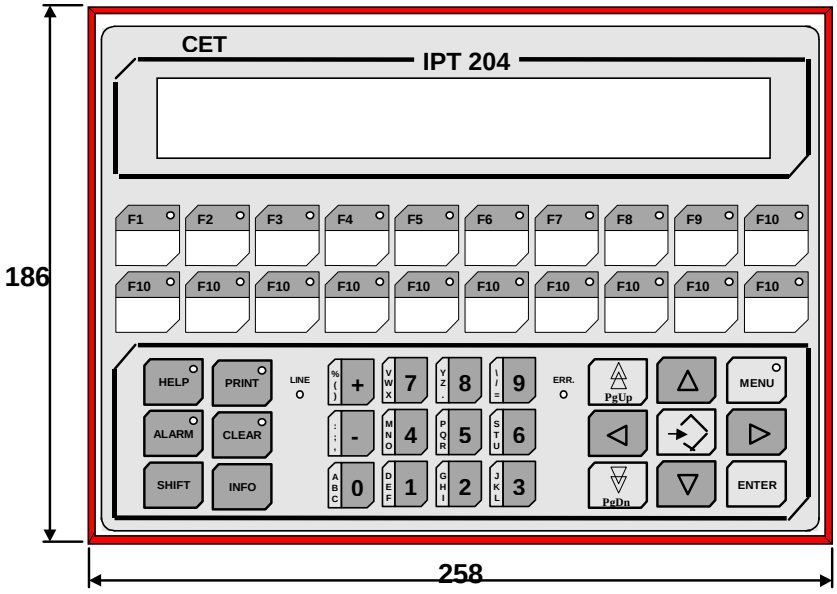
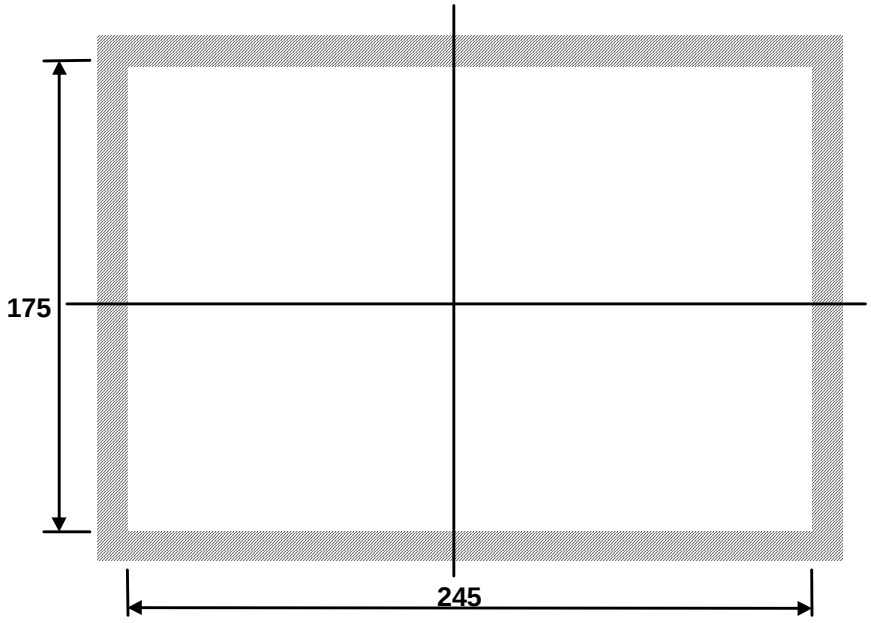


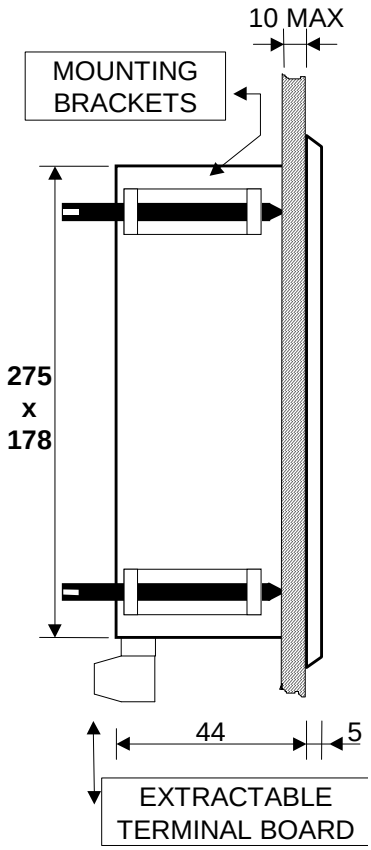
PANEL DRILLING



DISPLAY	: LCD 40 digits x 2 lines or 40 digits x 4 lines. Led backlit.
KEYBOARD	: 20 function keys with description strip for key
PROTECTION	: IP65
WEIGHT	: 1200 grams
POWER SUPPLY	: +18 / +30 VDC shielded by a 800 mA delayed fuse
LINE VOLTAGE	: 250 mA at 24 VDC (2A/10 mSec power-up peak)
FLASH MEMORY	: 512K for 1300/725 pages and 1050 functions
STANDARD	: CE, IEC.

2.6. O.P. IPG 208 TECHNICAL DATA

SIDE



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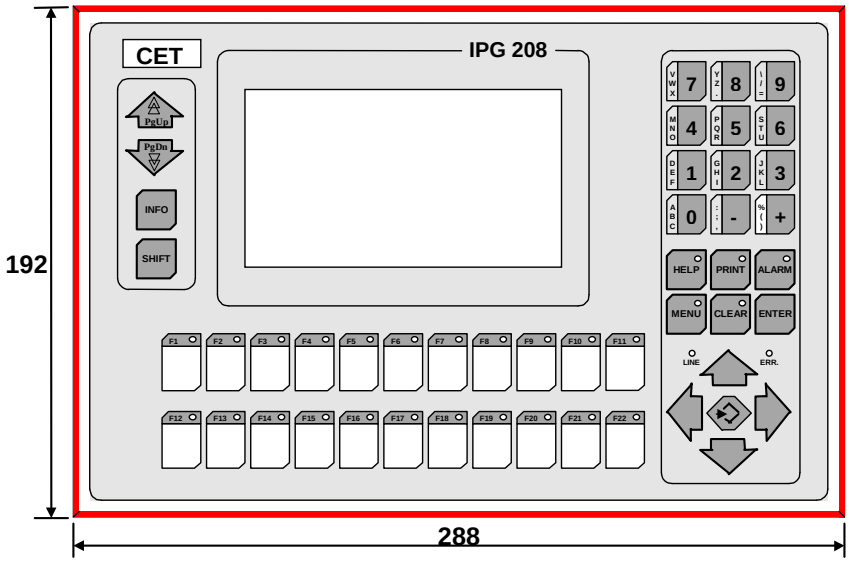
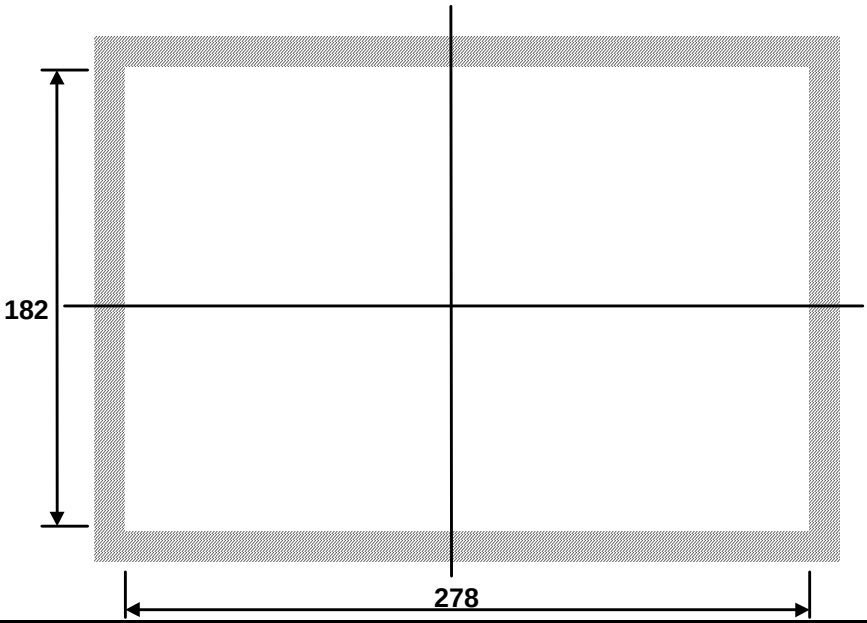


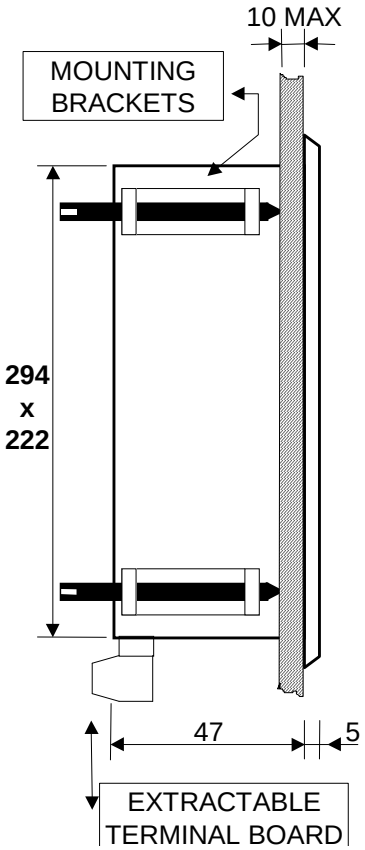
PANEL DRILLING



DISPLAY	: graphic LCD 240 x 128 pixel (30 digits x 12 lines) - Backlit with neon lamp
KEYBOARD	: 22 function keys with description strip per key
PROTECTION	: IP65
WEIGHT	: 1400 grams
POWER SUPPLY	: +18 / +30 VDC shielded by 800 mA delayed fuse
LINE VOLTAGE	: 300 mA at 24 VDC (2A/10 mSec power-up peak)
FLASH MEMORY	: 512K for 343 pages and 1050 functions
STANDARD	: CE, IEC

2.7. O.P. IPG 240 TECHNICAL DATA

SIDE



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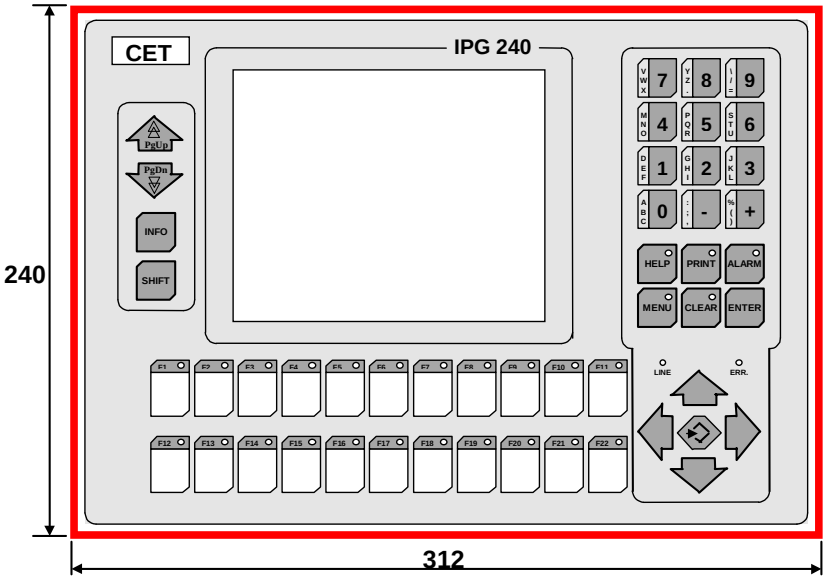
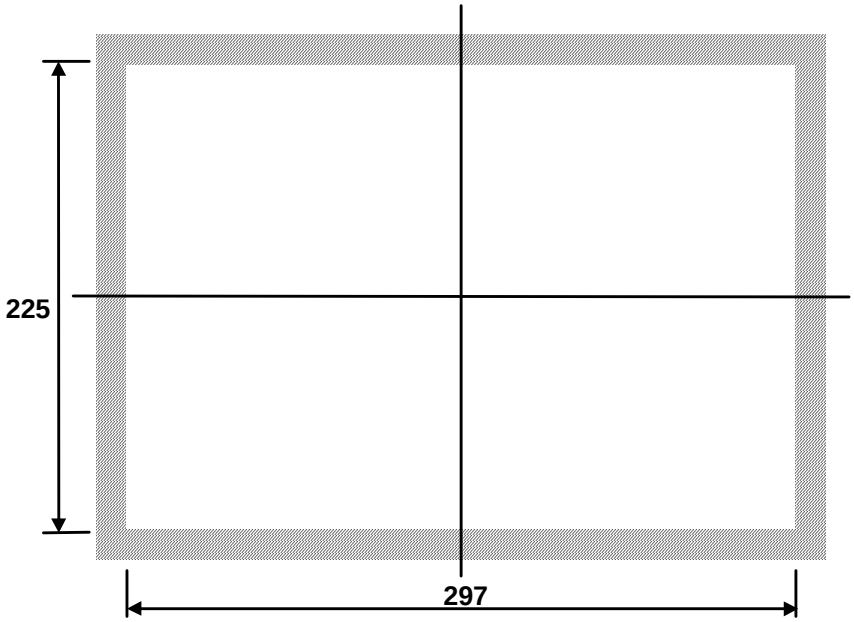


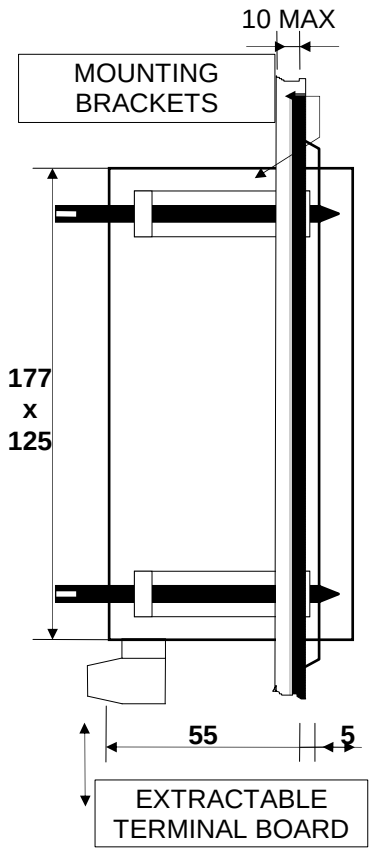
PANEL DRILLING



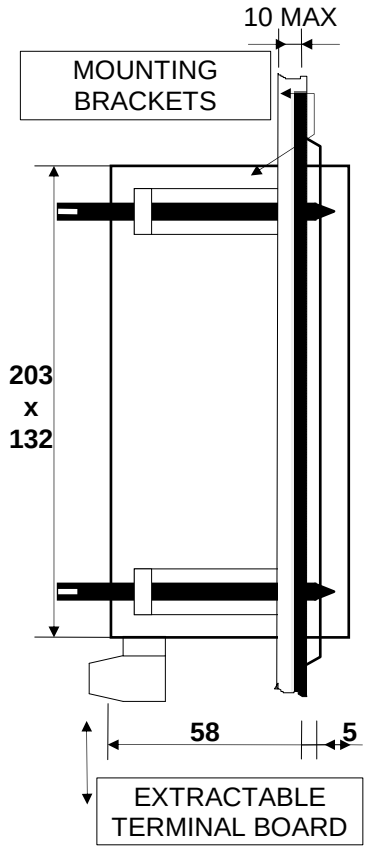
DISPLAY	: graphic LCD 320x200 pixel (40 digits x 20 lines) – Backlit with neon lamp
KEYBOARD	: 22 function keys with description strip for key
PROTECTION	: IP65
WEIGHT	: 1800 grams
POWER SUPPLY	: +18 / +30 VDC shielded by a 800 mA delayed fuse
LINE VOLTAGE	: 300 mA at 24 VDC (2A/10 mSec power-up peak)
FLASH MEMORY	: 512K for 159 pages and 1050 functions
STANDARD	: CE, IEC

2.8. DEPTH OF THE MODELS WITH SAR 7 BOARD

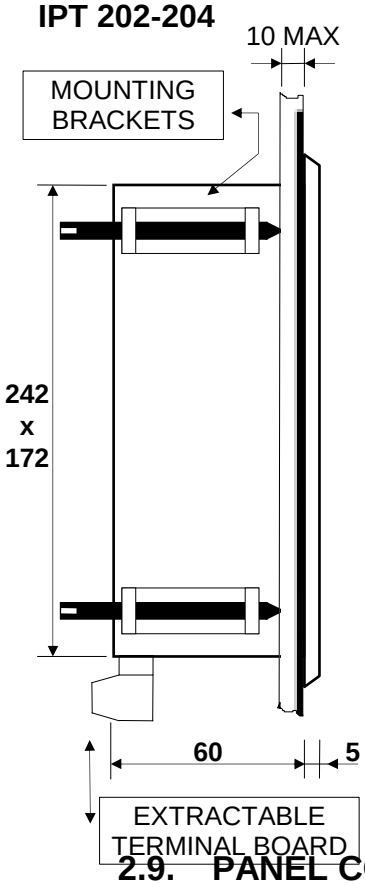
SIDE HPT



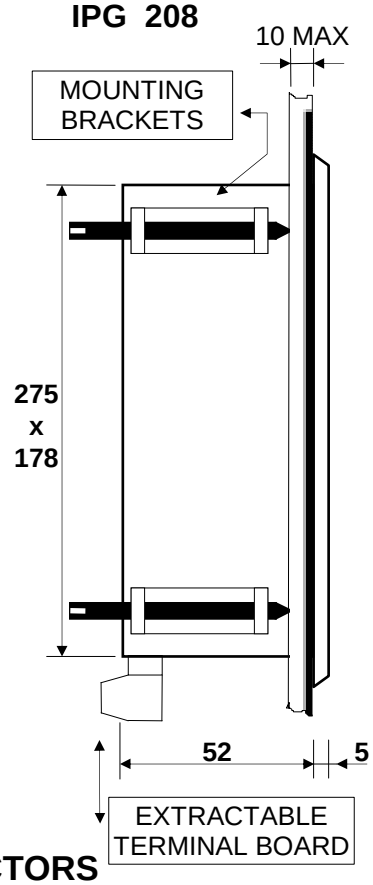
SIDE IPT 102-104 IPG 106



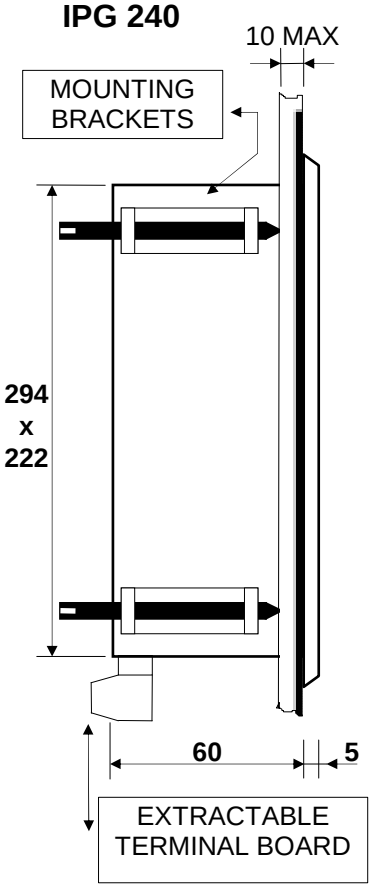
SIDE IPT 202-204



SIDE IPG 208



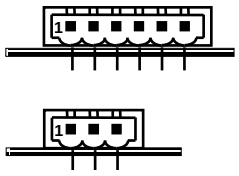
SIDE IPG 240



2.9. PANEL CONNECTORS

2.9.1. FEEDING CONNECTOR

The feeding connector is a 6-pole male connector (for the SAR7 version the connector is a 6-pole male connector)



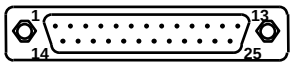
for SAR 7 version

Pin	Signal
1	+24 VDC
2	GROUND
3	EARTH
4	RS 485 TERMINATION
5	RS 485 +
6	RS 485 -

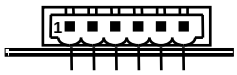
SAR 7 Version
+24 VDC
GROUND
EARTH

2.9.2. PLC SERIAL PORT

Serial connector PLC : Male connector D-SHELL, 25 ways



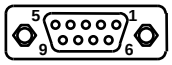
SAR 7



Pin	Signal	Signal SAR 7
1	GROUND	RS485 + A
2	RS 422 RXD +	RS485 + A
3	RS 422 RXD -	RS485 - B
4	RS 422 TXD +	RS485 - B
5	RS 422 TXD -	GND
6	RS 422 RTS +	EARTH
7	RS 422 RTS -	
8	RS 422 CTS +	
9	RS 422 CTS -	
10	RS 232 TXD	
11	RS 232 RXD	
12	RS 232 RTS	
13	RS 232 CTS	
14	RS 485 +	
15	RS 485 -	
16	EARTH	
17	EARTH	
18	TTY TX +	
19	TTY TX -	
20	TTY RX +	
21	TTY RX -	
22	TTY 20 mA	
23	TTY 20 mA	
24	TTL TX	
25	TTL RX	

2.9.3. PC SERIAL PORT

PC serial connector: female connector D-SHELL, 9 ways



Pin	Signal
1	GROUND
2	RS 232 TX
3	RS 232 CTS
4	RS 232 RX
5	RS 232 RTS
6	N.C.
7	N.C.
8	EARTH
9	EARTH

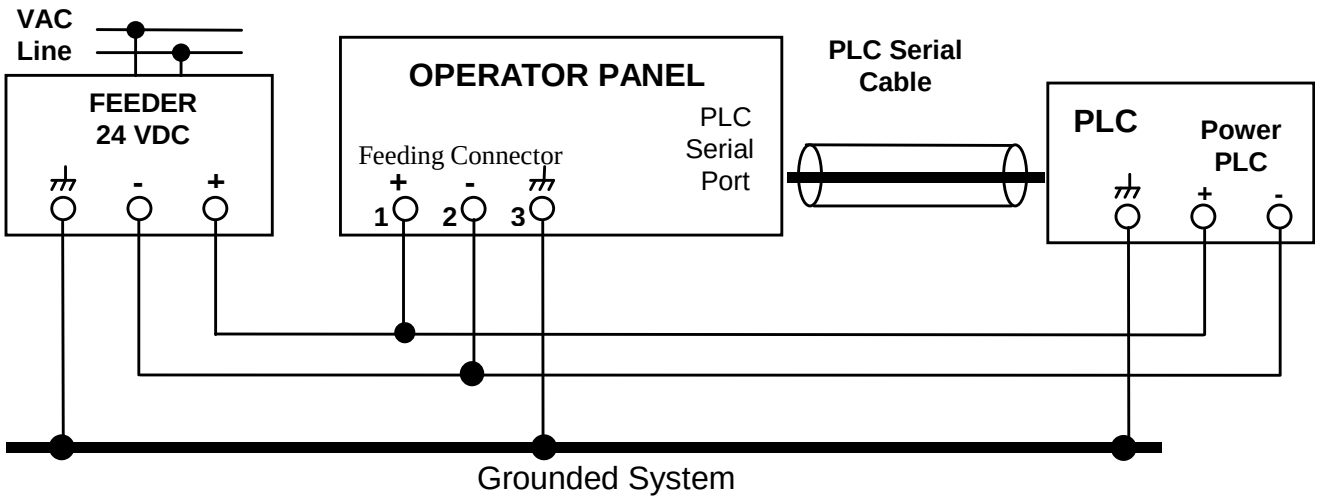
3. EXTERNAL CONNECTIONS

3.1. PANEL CONNECTION WITH POWER SUPPLY

The section of the feeding cable must be at least equivalent to AWG20.
The Feeding Signals to connect are **+24**, **GROUND** and **EARTH).**

3.1.1. GROUND CONNECTION

The instrument must be connected to the system as described in the following diagram:



Grounded System

3.2. PANEL CONNECTION WITH PC

The Panel connection with a **PC** is carried out in programming step.
The Panel must be **"OFF LINE"** if connected with the **PLC** and must be connected between the **" PC SERIAL PORT "** and the serial ports **COM 1 or COM 2** of a PC by means of the serial cable described in chapter 12. To take the Panel OFF LINE , “Panel Status” must be selected from the menu and the Reboot once more.
Now the Panel carries out the rebooting and the operator has 5 seconds to press the insert key, which enables the Panel to be in the following status:

PROGRAMMING
WAIT

3.3. PANEL CONNECTION WITH PLC

This is the usual working condition of the Panel **"ON LINE"**. According to the kind of PLC connected there is a different kind of interface. The connection port is always the **" PLC SERIAL PORT "** although with a different cable (described in chapter 12).

P L C		Interface and Parameters	Code Cable
Brand	**Model**		
ABB	PROCONTIC CS31	RS 232 9600 BPS N,8,1	CTPT / ABB
	PROCONTIC CS31 MODBUS	RS 232 9600 BPS N,8,1	CTPT / ABM
AEG	MICRO 311 / 411 / 511	RS 232 9600 BPS E,8,1	CTPT / AA
	MICRO A984 - 131	RS 232 9600 BPS E,8,1	CTPT / A
ALLEN BRADLEY	SLC 5/03	RS 232 19200 BPS N,8,1	CTPT / AB
	SERIES 5/60	RS 232 19200 BPS N,8,1	CTPT / ABS
	MICROLOGIC	RS 232 9600 BPS N,8,1	CTPT/ ABM
CGE FANUC	SERIES 90/30	RS 422 19200 BPS O,8,1	CTPT / C
	CMM 311	RS 422 19200 BPS O,8,1	CTPT / CC
CROUZET	RPX 10 / RPX 20 / RPX 30	C.L. 19200 BPS E,8,1	CTPT / CZ
HITACHI	EM	RS 232 9600 BPS N,8,1	CTPT / H
	EC	RS 232 9600 BPS N,8,1	CTPT / HC
	H200	RS 232 19200 BPS E,7,1	CTPT / HH
IDEC IZUMI	FA2J / FA3J	TTL 9600 BPS E,8,1	CTPT / I
KEYENCE	KV xx	RS 232 9600 BPS E,8,1	CTPT / Y
KLOCKNER MOELLER	PS306 / PS316	RS 485 9600 BPS N,8,2	CTPT / KM
	KMO - PS4	RS 232 9600 BPS N,8,2	CTPT / KO
MATSUSHITA	FP1 - FPM	RS 422 19200 BPS O,8,1	CTPT / NC
	FP1 - C14	RS 232 19200 BPS O,8,1	CTPT / NB
	FP - M 32TC	RS 232 19200 BPS O,8,1	CTPT / NA
MITSUBISHI	FX nn	RS 422 9600 BPS E,7,1	CTPT / M
	FX - 0 nn	RS 422 9600 BPS E,7,1	CTPT / MC
	AnS	RS 422 9600 BPS O,8,1	CTPT / M
OMRON	SERIES CxxxH - CxxxxH	RS 232 9600 BPS E,7,2	CTPT / O
	CQM1 - CxxH	RS 232 9600 BPS E,7,2	CTPT / OQ
	LK201 (25 poli)	RS 232 19200 BPS E,7,2	CTPT / O
SAIA	PCD2 / PCD4 (PGU)	RS 232 9600 BPS E,7,1	CTPT / PS
	INTERF. 232 - PCD7.F120	RS 232 9600 BPS E,7,1	CTPT / PSD
SIEMENS	S5 CPU 95 → CPU 115-943	C.L. 9600 BPS E,8,2	CTPT / S
	S5 CPU115 - 945	C.L. 9600 BPS E,8,2	CTPT / S
	S5 CPU135 - 928	C.L. 9600 BPS E,8,2	CTPT / S
	S7 - 2xx	RS485 9600 BPS E,8,1	CTPT / SS
	S7 - 3xx	RS485 scheda rete	CTPT / ST
TELEMECANIQUE	TSX 37xx	RS485 9600 BPS O,8,1	CTPT / TL
TOSHIBA	EX M20 / M40 - PROSEC	RS422 9600 BPS N,8,1	CTPT / T
	PROOSEC T1	RS232 9600 BPS N,8,1	CTPT / TT
	PROSEC T2	RS232 9600 BPS N,8,1	CTPT / TD
WEG	T01 / T11	RS232 9600 BPS 0,8,1	CTPT / W

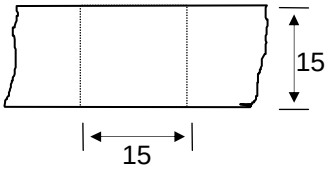
NOTE : The PLC protocol on which you are working, automatically enables the relevant physic interface.

4. KEYBOARD

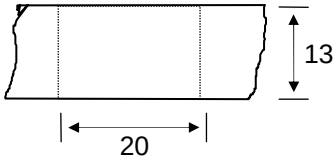
4.1. DESCRIPTION STRIP

The size of the strips depend on the Panel. There are two kinds of window areas to describe the key according to the instrument:

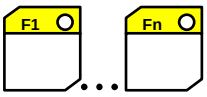
IPT 102/104 - IPG 106 - IPG 208 - IPG 240



IPT 202/204



4.2. KEYS



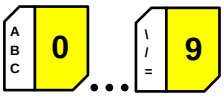
FUNCTION KEYS: they carry out the **Functions** programmed by **"**CETPRO 3" and can be defined in programming step:

a) **FUNCTION KEY**
b) **RECIPE KEY**
c) **TITLE KEY**

Furthermore each Function Key can also be programmed as:

d) **SLAVE KEY**

To close a function opened by a Function Key and to return to the previous position, click for the second time.



NUMERICAL KEYS: they are used to input **NUMERICAL** and **ALPHABETICAL** data. They are usually numerical keys. Used also as alphabetical keys combining **SHIFT+KEY,** numerical characters are inserted, or if you click more times, the capital letters or lower-case letters printed on the key are inserted.

Prints the displayed message on the printer connected to the Panel.

Shows on the current page the ALARM WARNING line.

Generic clearing Key.

Enhances the value of a variable.

Decreases the value of a variable.

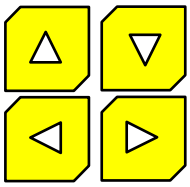
Opens the **MENU**.

ALARM KEY: it displays/acquires the **ALARMS** detected on the PLC.
If you click a second time, the last displayed page will be shown again.

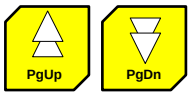
KEY HELP: displays the **HELP** messages linked to the page.

INSERT KEY: enables to digit the value of a variable.
While the Panel is “OFF LINE” it enables the **Programming** towards the PC.

CONFERMATION KEY



ARROW KEYS: enable movement across and in the fields.



PAGE UP and DOWN KEYS: enable you to run through the pages.

KEY SHIFT: used for the alphanumerical edit.

4.3. LEDS

4.3.1. RED LED FUNCTION KEYS

It can be programmed with the CETPRO 3 programme as follows:

1) It is switched on pressing the relevant function and remains on until the key is pressed again.
2) It is switched on with pulses pressing the relevant function key.
3) Always turned off.

Through the COMMUNICATION with the PLC (DW12 - DW13) you can always drive the Led lighting.

4.3.2. GREEN LED MENU KEY

- Flashing pressing the menu key.

4.3.3. RED LED ALARM KEY

- Continuously lit; it means that the manual display is on.
- Flashing; it advises that an immediate or discretionary alarm has taken place.

4.3.4. GREEN LED HELP KEY

- Flashing; it advises that a help message is linked with the displayed page.
- Continuously lit, when a help page is displayed.

4.3.5. GREEN LED PRINT KEY

- It flashes when printing is underway.
- Continuously lit, in case of print error.

4.3.6. GREEN LED CLEAR KEY

- It flashes when clearing is on.

4.3.7. GREEN LED “LINE”

- Continuously lit, when the O.P. is communicating with the PLC (“ON LINE” status).

4.3.8. RED LED “ERR”

- Flashing when there is a **communication error** with the PLC.
- Continuously lit, when it is in **programming error** status.

5. O.P. OPERATION

After being switched on the P.O can operate in the following 2 modes:

1) **OFF LINE**
2) **ON LINE** with the PLC

5.1. OFF LINE OPERATION

After being switched on the O.P. displays the following:

OFF LINE

which shows that the Panel has been correctly programmed.
Otherwise the O.P. shows the following message:

NOT PROGRAMMED
Cause of error

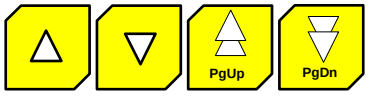
Before beginning communication with the PLC the Panel must be reprogrammed.

5.2. ACTIVE COMMANDS IN OFF – LINE STATUS

Displays the firmware **VERSION** of the O.P. as well as the **DATE** of creation.

Displays the PLC **PROTOCOL** stored in the memory of the O.P., its **VERSION** and **DATE** of creation.

It shows the pages stored on the O.P.

Using the keys  you can run through the pages.

Keyboard and Led Test. The display shows “TEST KEYBOARD” on the first line and the name of the pressed key on the second line. The Led of the pressed key is lit on.

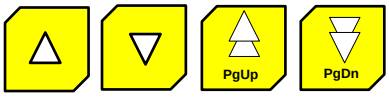
Test: Led scanning.

Open Menu.

If programmed as Recipe Key, it shows the relevant Recipe.

5.2.1. MENU

You can enter the O.P. Menu with a simple click on it.
Inside the menu the following keys are effective:



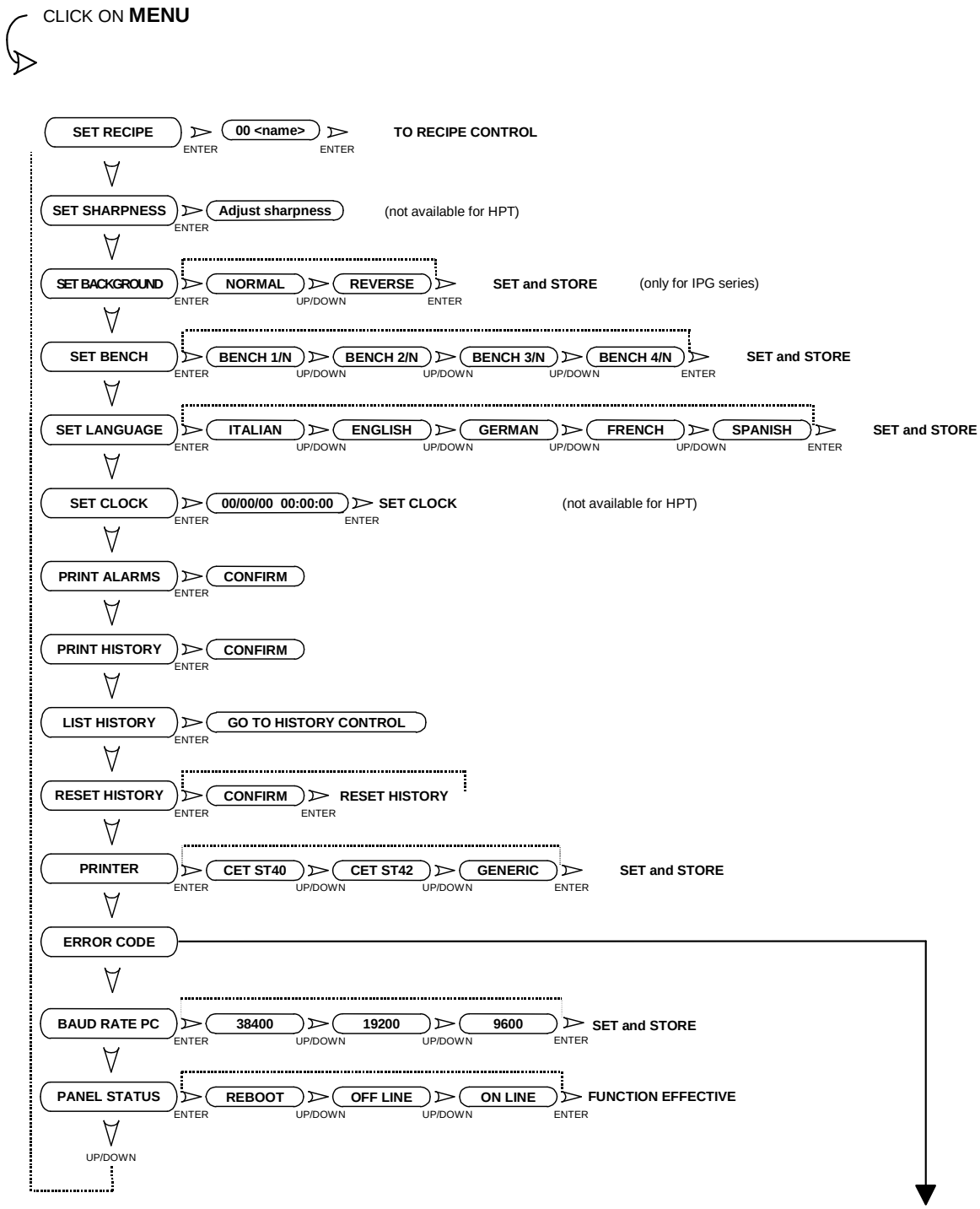
They allow you to run through the Menu choices.

Enables the selected Menu choice.

Closes the Menu returning to the OFF LINE status or shifts to a lower level inside the menu.

5.2.2. MENU CHOICES

MENU STRUCTURE OPERATOR PANEL OPTIONS



Code	0101:	not valid protocol	code 0107:	Image writing error
Code	0102:	address error	code 0108:	Image reading error
Code	0103:	data size error	code 0109:	alarm reading error
Code	0104:	reading code error	code 010A:	recipe reading error
Code	0105:	writing code error	code 010B:	recipe writing error
Code	0106:	preset code error	code 010C:	strobe writing error

5.3. PANEL OPERATION CONNECTED WITH PLC ("ON LINE")

If the connection with the PLC is correct, the Panel automatically begins communication going to the **"ON LINE"** status, 5 seconds after the OFF LINE status.
This state is highlighted by the green led "LINE" lit and by the message written on the " **0 PAGE** " displayed on the Panel.

5.3.1. COMMUNICATION MODE BETWEEN O.P. AND PLC

The O.P. can both read and write the PLC settings via the communication **"PROTOCOL"**.
The date are exchanged in three ways:

1) By the **" COMMUNICATION IMAGE"**, made up of a block of 12 PLC settings, read or written from the O.P. on a cycle every 500 ms (**Note**: for some PLCs may be longer).

2) **ADDRESSING** the PLC settings either in reading or writing.

3) **ADDRESSING** a block of settings in the "RECIPE" case.

5.4. COMMUNICATION IMAGE

The communication image address is determined in the programming step with the CETPRO 3 software.

The COMMUNICATION IMAGE consists of 8 WORDs in WRITING and 4 in READING from the Panel to the PLC:

BIT15 BIT 0

HS	PTO	PRA	PRN		INFO	RIC	TIT	PAG	HLP	MENU	ALD	ALI	FUN	FAL	KEY

IC_SW

F16	F15	F14	F13	F12	F11	F10	F9	F8	F7	F6	F5	F4	F3	F2	F1

IC_KB1

9	8	7	6	5	4	3	2	1	0	F22	F21	F20	F19	F18	F17

IC_KB2

+	-	SH	AL	HLP	INFO	CLR	PRN	PGDW	PGUP	DW	UP	LFT	RGT	MENU	ENT

IC_KB3

FUNCTION NUMBER	NUMBER OF THE DISPLAYED MESSAGE

IC_MV

DAY	MONTH

IC_T1

TIME	MINUTES

IC_T2

YEAR / SECOND TENS			F28	F27	F26	F25	F24	F23

IC_T3

ST	S. OK	S. ER		FUNCTION NUMBER

IC_FUN

HIGH PARAMETER	LOW PARAMETER

IC_PAR

LD16	LD15	LD14	LD13	LD12	LD11	LD10	LD9	LD8	LD7	LD6	LD5	LD4	LD3	LD2	LD1

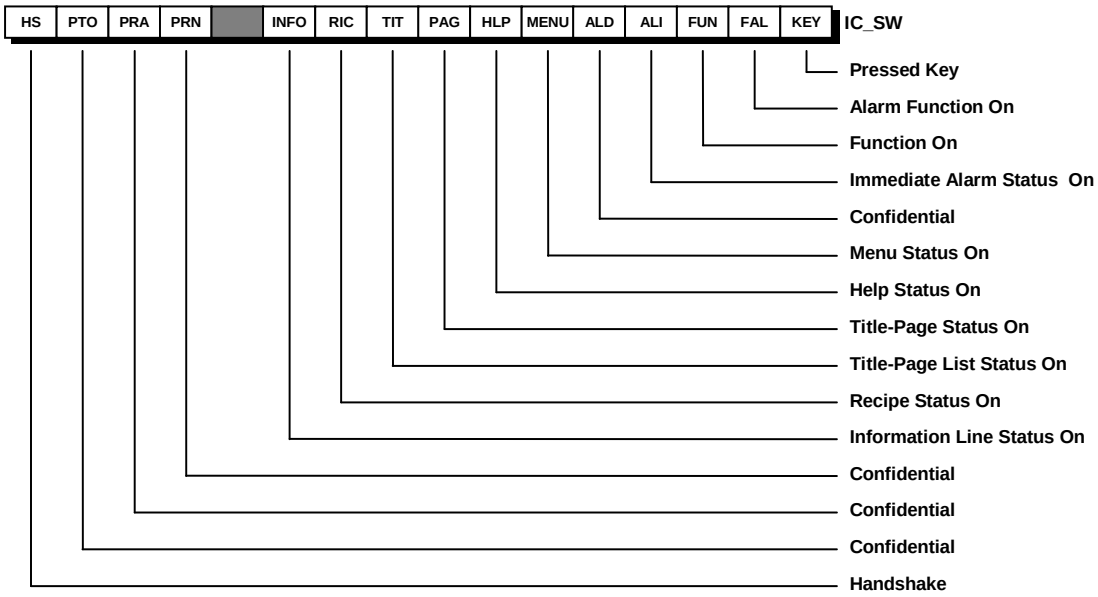
IC_LD1

TLCK	FLCK	LOCK	BUZZ	LD28	LD27	LD26	LD25	LD24	LD23	LD22	LD21	LD20	LD19	LD18	LD17

IC_LD2

5.5. “WORD” IN WRITING MODE

5.5.1. IC_SW



The word**,** organized to bit, is called **Information Exchange** as it contains all the main state signals regarding the Panel operation. The bits have the following meaning:

♦ **Bit 0 - Pressed Key Bit**

In the operating state, it shows that at least one key of the front Panel has been pressed. The effectively pressed key can be recognized examining the words IC_KB1/2/3.

- **Bit 1 - Alarm Function On Bit**

In the operating state, it shows that an Alarm Function on the Panel is on.

- **Bit 2 - Function On Bit**

In the operating state, it shows that the Panel is processing a Function-Page.

- **Bit 3 - Immediate Alarm On Bit**

In the operating state, it shows that an Immediate Alarm is on and displayed on the Panel.

- **Bit 4 - Discretional Alarm On Bit**

In the operating state, it shows that a Discretional Alarm on the Panel is on.

Bit 5 - Menu Bit

In the operating state, it shows that the Panel is in the Menu status.

- **Bit 6 - Help Bit**

In the operating state, it shows that the Panel is displaying a Help page.

- **Bit 7 - Page Bit - Slave**

In the operating state, it shows that the Panel is displaying a Slave - Page.

- **Bit 8 - Title Bit**

In the operating state, it shows that the Panel is displaying the “Titles” Page list.

- **Bit 9 - Recipe Bit**

In the operating state, it shows that a Recipe has been open.

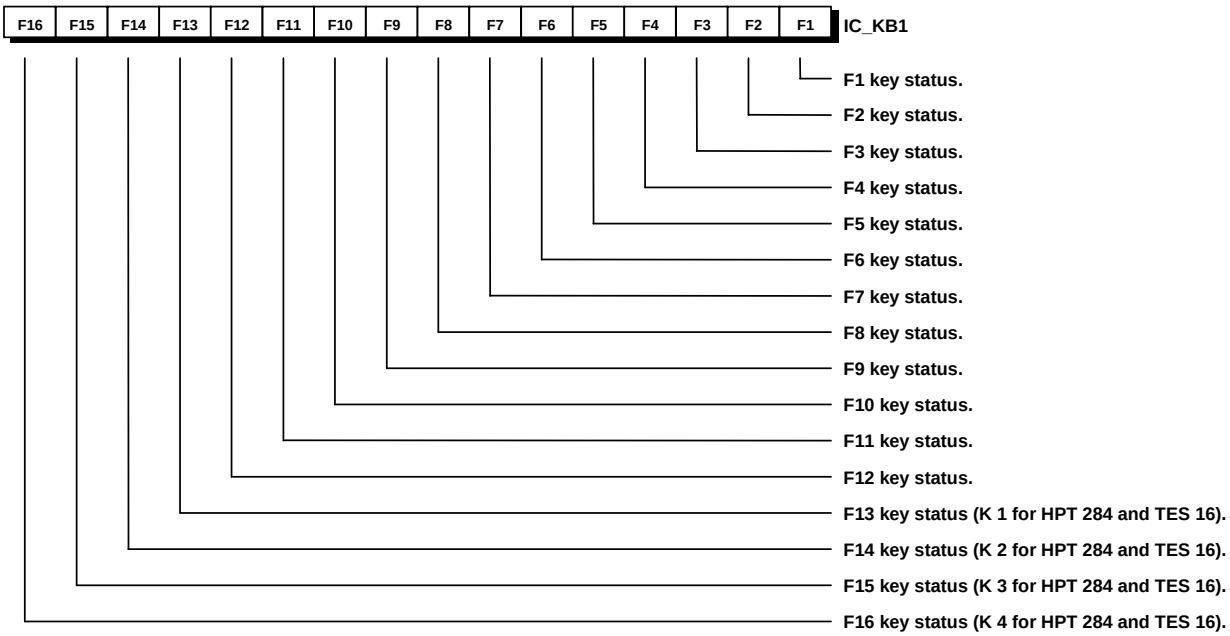
- **Bit 10 - Information Line Bit**

In the operating state, it shows that the Panel is displaying the Information Line recalled with the INFO key.

- **Bit 11 - bit 12 - bit 13 - bit 14** Confidential
- **Bit 15 - Flag Handshake**

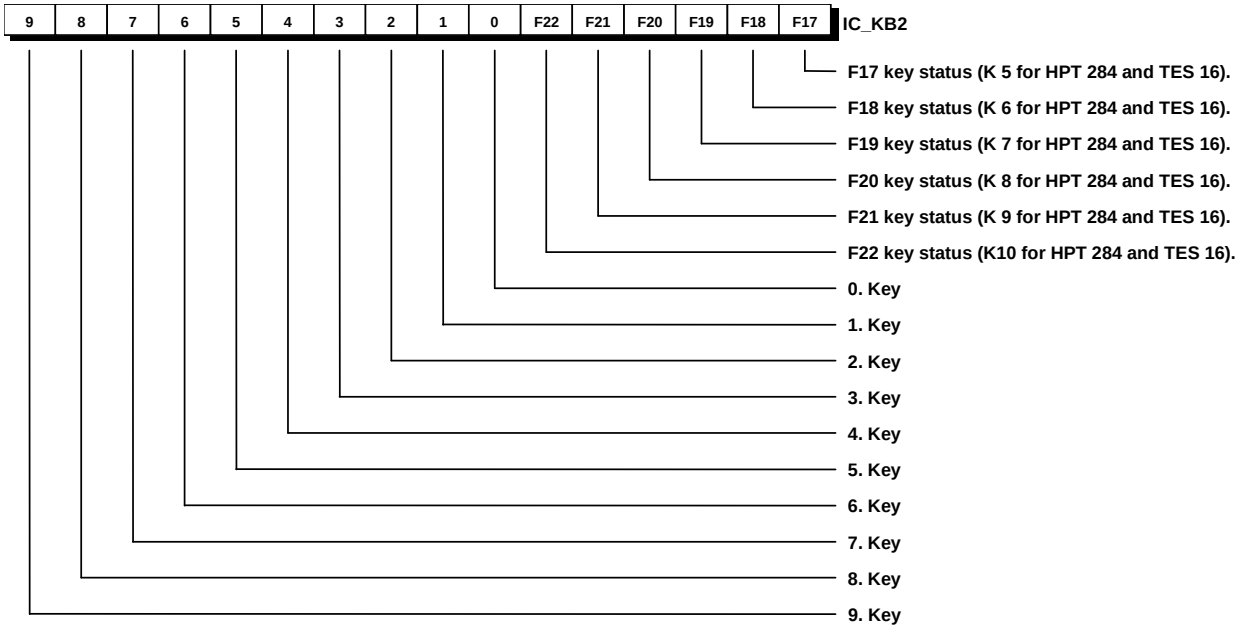
This bit is forced by the Panel to Function On (bit setting 1) at each scanning cycle, in order to provide the way of showing whether there is an instrument along the serial line or not. Actually, if the application of the controller continuously resets this bit, monitoring therefore when it is written again, it can detect whether there is the Panel or not (maximum time out 10 seconds).

5.5.2. IC_KB1



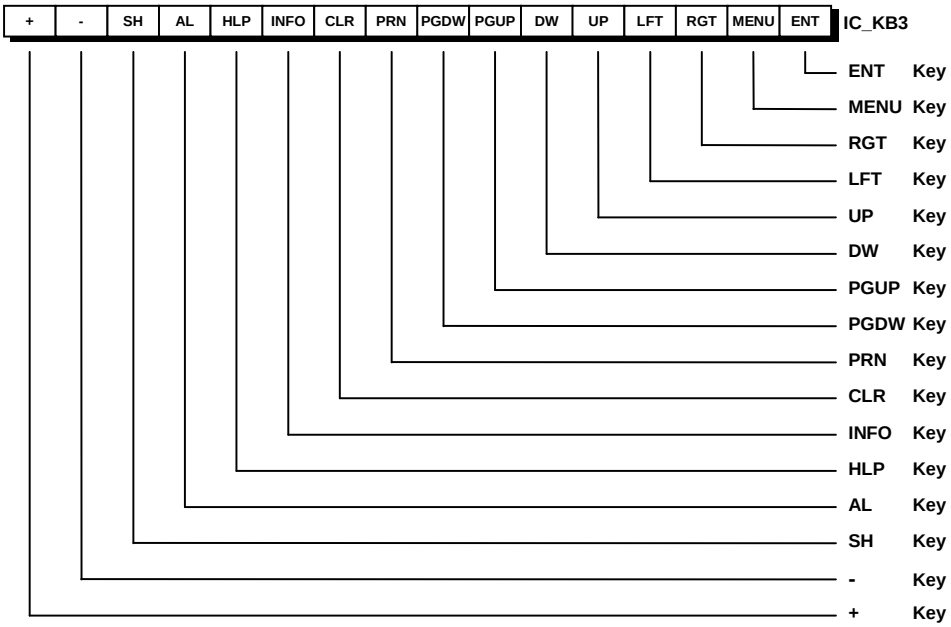
DW2, **DW3** and **DW4** words that are set in bit show to the PLC which front keyboard key has been pressed:
DW2 : Bit 0 - Bit 15 Pressed Key
It shows the Key state: 0 if not pressed, 1 while pressing the key.

5.5.3. IC_KB2



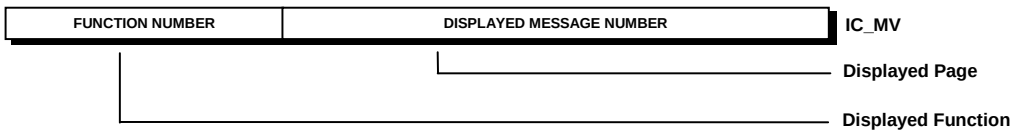
♦ **DW3 : Bit 0 - Bit 15 Pressed Key**
It shows the Key state: 0 if not pressed, 1 while pressing the key.

5.5.4. IC_KB3



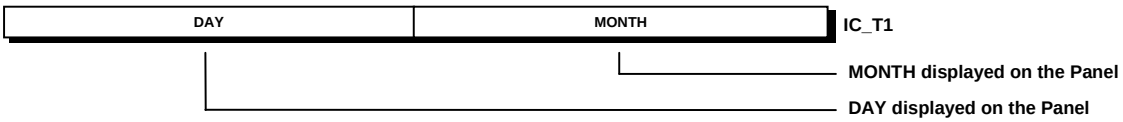
♦ **DW4 : Bit 0 - Bit 15 Pressed Key**
It shows the Key state : 0 if not pressed, 1 while pressing the key.

5.5.5. IC_MV



This WORD shows the number of the displayed Page as well as its related, relevant Function Key.
The first 11 bits show the number of the page, the following 5 bits show the number of the Function Key.

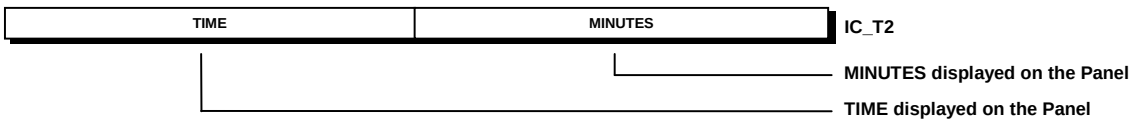
5.5.6. IC_T1



This WORD allows you to read the Real Time Clock (RTC) of the Panel:

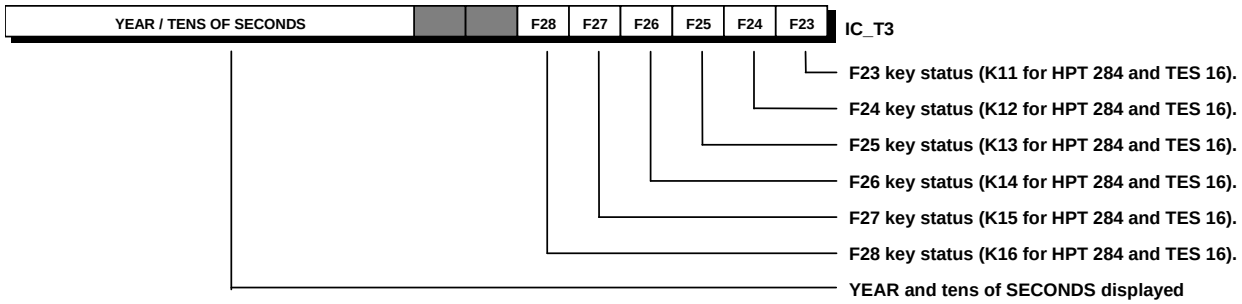
bit0-bit7: MONTH in BCD;
bit8-bit15: DAY in BCD

5.5.7. IC_T2



This WORD allows you to read the Real Time Clock (RTC) of the Panel:
bit0-bit7: MINUTES in BCD;
bit8-bit15 : TIME in BCD

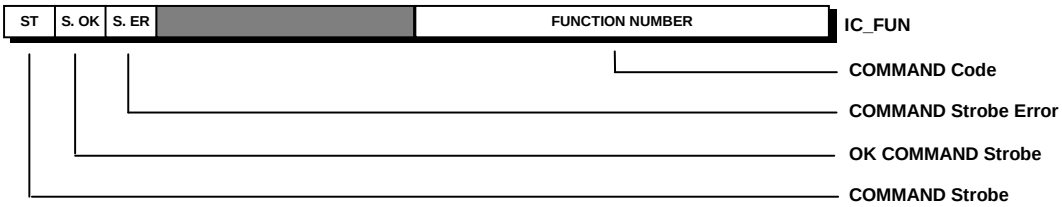
5.5.8. IC_T3



This WORD allows you to read the Real Time Clock (RTC) of the Panel:
bit 8 - bit 11: tens of SECONDS in BCD;
bit 12 - bit 15: YEAR in BCD
bit 0 - 5: key STATUS

5.6. READ-ONLY “WORD”

5.6.1. IC_FUN



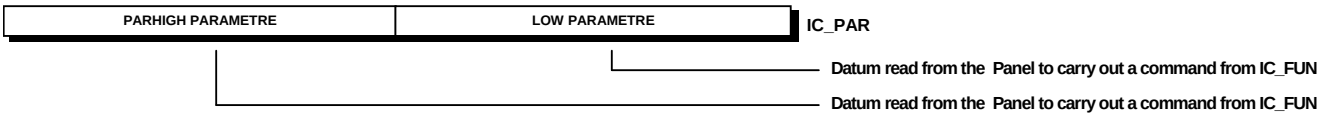
This WORD allows you to give out commands from PLC towards the Panel:
- in the first 8 bits the command code is written.
- putting bit 15 to 1 the Panel is forced to carry out the Command. Bit 15 is automatically reset as soon as the command has been accomplished.

List of the available commands:

- code 0 : void command
- code 1 : back to message 0
- code 2 : open function page (*)
- code 3 : close function page
- code 4 : open function key
- code 5 : close function key
- code 6 : open title-pages list
- code 7 : close title-pages list
- code 8 : open help page
- code 9 : close help page
- code 10 : read Recipe from PLC
- code 11 : write Recipe from PLC
- code 12 : print current display
- code 13 : print required message
- code 14 : print alarm list
- code 15 : print history
- code 16 : information line ON
- code 17 : information line OFF
- code 18 : time OFF
- code 19 : select message bench
- code 20 : select system language
- code 21 : not available
- code 22 : close Slave page
- code 23 : close recipe from PLC

(*) A Page without Functions cannot be retrieved.
The data related to the commands are entered in word IC_PAR.

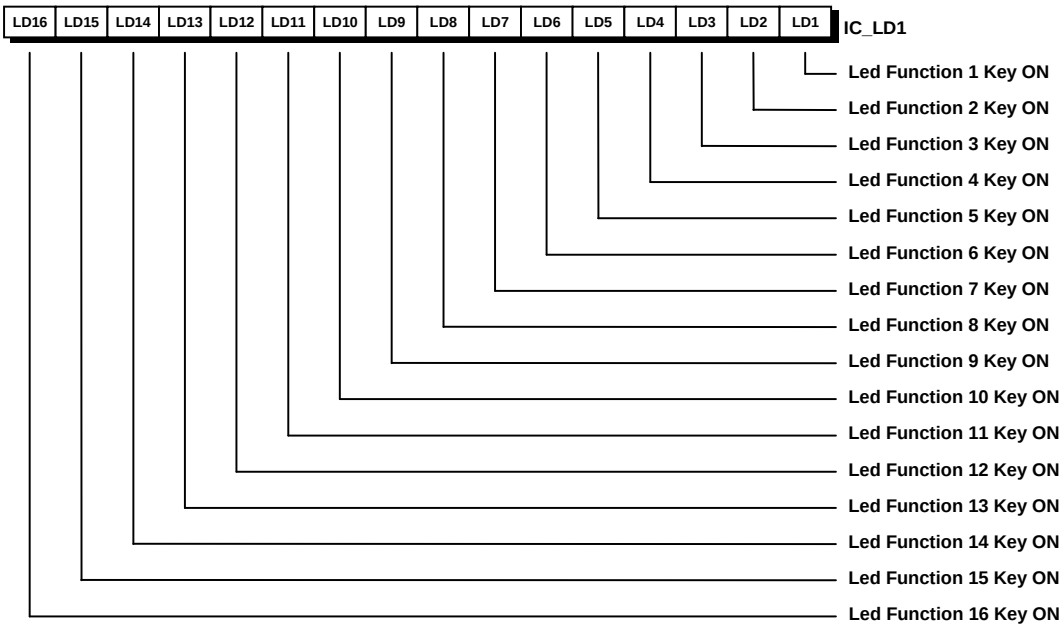
5.6.2. IC_PAR



These two parameters show a different datum according to the relevant command:

	HIGH	LOW
code 0 command	0	0
code 1 command	0	0
code 2 command	Functions - Page Number	
code 3 command	0	0
code 4 command	Key Number	Level Number
code 5 command	0	0
code 6 command	0	0
code 7 command	0	0
code 8 command	0	0
code 9 command	0	0
code 10 command	Not available Command	
code 11 command	Not available Command	
code 12 command	0	0
code 13 command	Message Number	
code 14 command	0	0
code 15 command	0	0
code 16 command	0	0
code 17 command	0	0
code 18 command	0	0
code 19 command	0	Bench Number
code 20 command	0	Language Number
code 21 command	Not available Command	
code 22 command	0	0
code 23 command	0	0

5.6.3. IC_LD1

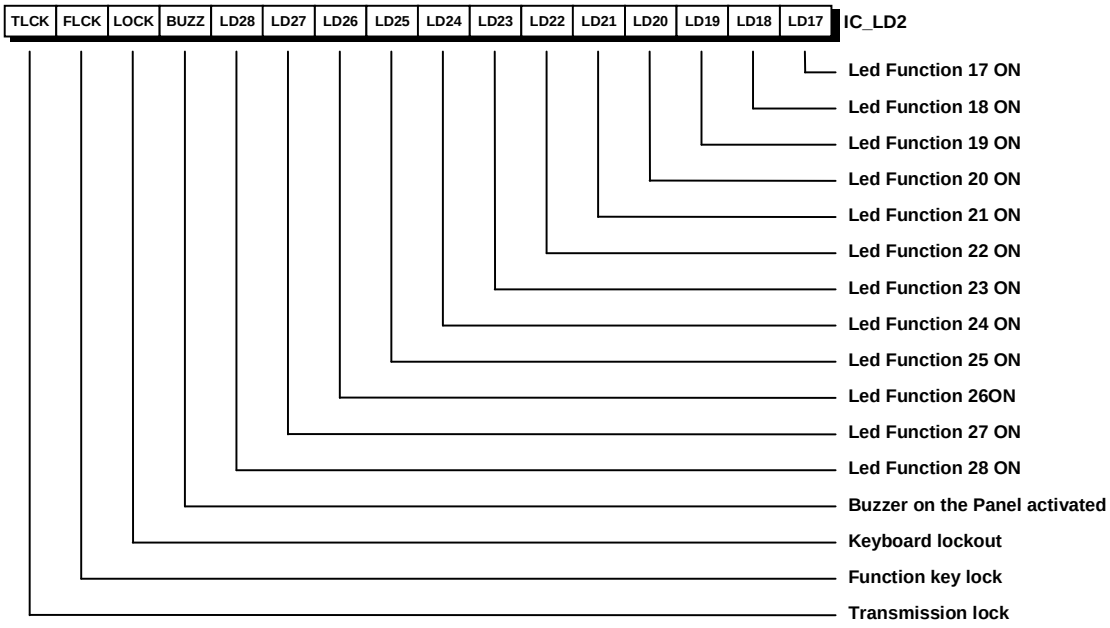


The words **DW11** and **DW12** are organized in bit and enable the PLC to directly control the ON/Off status of the leds related to the function keys.

- **DW11 : Bit 0..15 Led Command F1..F16**

In the ON state they are responsible for the switching on of the corresponding led.

5.6.4. IC_LD2



- **DW12 : Bit 0..11 Led Command F17..F28**

In the ON state they are responsible for the switching on of the corresponding led.

- **Bit 12 Required Buzzer Flag**

In the ON state it is responsible for the switching on of an intermittent acoustic signal by means of the buzzer inside the Panel. The signal continues until the bit itself is reset, which can only occur through Communication Image.

- **Bit 13 Keyboard Blockout Flag**

In the ON state it is responsible for the complete blockout of the front keyboard. Setting this bit to 1 the normal operation of the keyboard is prevented until the reset of the bit itself.

- **Bit 14 Panel Function Block Flag**

In the ON state it is responsible for the block of the keyboard section related to the function keys. Setting this bit to 1 the function keys are blocked until the reset of the bit itself.

- **Bit 15**
- **Keyboard Transmission State Block Flag7*014**

In the ON state it is responsible for the communication block of the keyboard state in real time.

5.7. COMMAND SYNCHRONISM

If you wish to enter a series of commands to the Panel through the Communication Image “IMC”, you should respect the synchronization timing as follows:

1) Open page Command

Example:

Open page 27 [Address IMC = 0]

Sequence in the PLC

Cycle	Word	Hexadecimal	Binary	Decimal
WR	WORD 9 - IC_PAR	001B	0000000000011011	27
WR	WORD 8 - IC_FUN	8002	1000000000000010	32770

Writing these two words in sequence on the PLC recalls page 27 on the Panel.

2) Check command entered successfully

If you wish to send another command in sequence, first check that the command has been carried out by the Panel.

Sequence in the PLC

Cyclically read IC_FUN until bit 14 becomes = 1

Example:

- if bit 14 of IC_FUN is = 0 ⇨ cyclically repeat reading.
- if bit 14 of IC_FUN differs from 0 ⇨ no longer waiting time, go to the following cycle.

To carry out a new command from Communication Image, repeat the sequence as it is shown at 1).

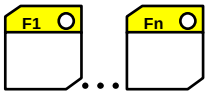
N.B. a page opened with communication image cambe close in two different mode according to the panel programmation:

1) With INC with the " **CLOSE FUNCTION PAGE** ", command and with clear key (the key led blinking when the function is activ).

2) With IMC only with " **CLOSE FUNCTION PAGE** ".

6. KEYBOARD FUNCTIONS IN ON – LINE STATUS

6.1. FUNCTION KEYS

The **function keys** programmed using 

can take on function modes according to how they have been "CETPRO 3" programme.

1) Recall **FUNCTION PAGE** programmed with Visualizing, Modification, or Preset functions.
2) Running in **KEY - SLAVE** mode, recalling either a Function page or a Preset function.
3) **RECIPE** recall.
4) Running in **TITLES - KEY:** list of the titles of the “Titles” Pages and choice.
5) Not programmed.

6.1.1. FUNCTION KEY

To a Function Key you can associate a maximum of 256 pages and in each case so that it does not exceed the maximum value available for that Panel. The total number of functions controlled by a Function Key is 256.
Pressing the function key, two things can happen:

1. The Function Key is protected by a **PASSWORD**: in this case the display shows a dialogue box with four digits:

   — — — —

The operator must type in the programmed Password. The Password consists of only numbers.

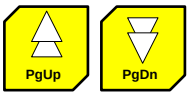
Ex. 4179 CORRECT ~~41AB~~ WRONG

If the Password is correct, the Entry page for that key is displayed on the O.P.
If the Password is not correct the lines for the digits are displayed again on the O.P.
The following pages after the first one entered in the Function Key do not require any Password.

2. The Function Key is not protected by the Password: the Entry page is immediately displayed.
   The **ENTRY** level of the key is programmed with the CETPRO 3 programme; The first page related to the Function Key is displayed (default setting), otherwise the required one of the level.

   Example: pages 10,11,12,13,14 related to F1 key,
   if **entry** = default the displayed page is the last one displayed on the panel
   if **entry** = 3 the first page displayed is page 12.

The operations on the page will be described afterwards in the specific chapter.



The keys PgUp and PgDn or ↑↓ allow you to run through the display all the programmed pages on that key, from the first to the last one.

Further effective keys:

Opens/Closes the HELP PAGES, related to the Function Pages. The led on the key shows, as it is programmed, whether there is any Help page related to the displayed page.
There may be more Help pages associated to a Function Key; the PgUp and PgDn arrows allow you to run through all of them.

It closes the Function Key taking the Panel again to the previous status. Function Key is automatically closed when another Function Key is pressed.

6.1.2. SLAVE - KEY MODE

Each Function Key can be programmed as Slave-Key.

A Slave-Key can recall a Function Page or a Preset function according to how the CETPRO 3 programme has been programmed.
When, for example, page 10 is programmed and F1 and F2 keys are related to it as Slave Keys to check Motor 1 in Ahead or Backwards, you have :

Page 10
F1 : MOTOR 1 ON
F2 : MOTOR 1 OFF

Therefore, pressing F1 the Preset function related to the F1 Slave-key becomes effective and pressing F2 the Preset function related to the F2 Slave-key becomes effective.
The same F1 and F2 keys can assume a different meaning if programmed on another page or programmed to recall Function Pages.

From a Slave-Key a Functions-page can be recalled.
For example, if you wish to select a certain number of motors and switch them on with the F1 Slave- and F2 Slave-key from pages 10 and 11 :

Page 10
F1 : MOTOR 1
F2 : MOTOR 2

F1 recalls page 11 as Slave-key related to motor 1
F2 recalls page 12 come Slave-key related to motor 2

Page 11
F3 : MOTOR 1 OFF
F4 : MOTOR 1 ON
F8 : RETURN TO MAIN MENU

F3 activates the Preset putting MOTOR 1 OFF
F4 activates the Preset putting MOTOR 1 ON
F8 recalls page 10 through Communication Image

Page 12
F3 : MOTOR 2 OFF
F4 : MOTOR 2 ON
F8 : RETURN TO MAIN MENU

F3 activates the Preset putting MOTOR 2 OFF
F4 activates the Preset putting MOTOR 2 ON
F8 recalls page 10 through Communication Image

6.1.3. FUNCTION KEY AS RECIPE KEY

The programmed **"RECIPE"** is recalled on the Panel display.
The operations that can be carried out with a Recipe will be described in the specific chapter.
Pressing the Function Key again, you return to the previous status.

6.1.4. "TITLES" KEY

The "Titles" Key is a Function Key programmed to recall the titles - pages list.
The **"TITLES" PAGES are Text and Function pages that are not related to a Function Key but that are recalled through the Titles - Key.**

The commands  enable you to run through the list moving the title cursor "⇐ ":

```
        Titles
⇑  FAN MOTORS
   CARRIAGE MOTORS
   PANEL STATE
⇓  THERMAL SENSORS
```

The Key  activates the selected page.

The Key  closes the Title - Page.

Note: the **"TITLES" KEY** is effective only when page 0 is displayed on the Panel.

6.2. ALARM KEY

The Alarm Key allows you to:

1. **acquire** the **active alarm** messages displayed and store them in the history.

2. **recall** the messages related to the **active alarms**.
   - The alarm page is closed pressing the ALARM key again.
   - If there are more alarms effective, you can run through the relevant messages with the PgUp / PgDn keys.

6.3. MENU KEY

The function of the Menu Key is to recall the "MENU".

6.4. INFO KEY

It enables to display the **Information Line** related to the alarms on the last line of the page; the page is shifted one line upwards.
Pressing the Key twice the page is taken back to the initial conditions. The information line referring to the alarms provides information on how many and which effective alarms are stored in the Panel memory.

```
        F3 : MOTOR 2 OFF
        F4 : MOTOR 2 ON
        F8 : RETURN TO MAIN MENU
A 004 : 1 2 4 6
```

Info Line ⇒

A 004 : it means that 4 Alarms are effective.

1 2 4 6 : these are the numbers of the active Alarms.

6.5. PRINT KEY

Prints the displayed message on the printer connected to the Panel.

6.6. DISPLAY CURSOR

On the display page, the cursor shows the position from which the operator can carry out input operations of a field under modification.
Two types of cursors are available:

- external CURSOR to the field under modification.
- Internal CURSOR to the field under modification.

The format of the cursor depends on the kind of display of the Panel.

7. PAGES

The **PAGES** are what is displayed. They have the size of the display, in **LINES** and **COLUMNS**, and therefore vary according to the O.P. They are programmed and stored inside the Panel through the **"CETPRO3"** programme. The maximum number of pages that can be controlled by a Panel depends on the **PAGE SIZE** (In the "TECHNICAL DATA" paragraph, the values for each Panel are highlighted).
Different kinds of page are available:

1) **Text-only Page**
- Alarm Pages
- Help Pages

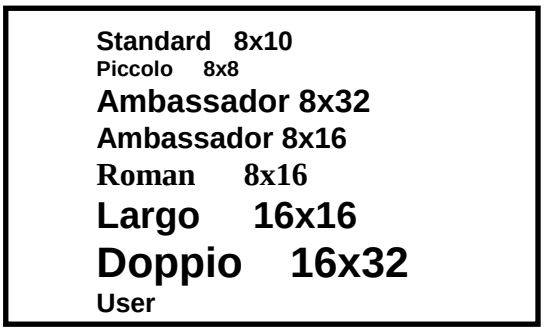
2) **Page with Functions**
- Alarm Pages
- "Titles" Pages
- Slave Pages
- Status Pages

7.1. TEXT- ONLY PAGE

It is a **PAGE** displaying a MESSAGE; **Alarm Pages, Help Pages** or **Page 0** are text-only pages.

7.1.1. FONT

The following 7 fonts are already stored in the Panel and available for the user.
Furthermore you can use a personalized font called USER, in order to create special characters or symbols.
N.B. The User font can vary from one project to another.



7.1.2. CHARACTER CODE

The characters that are available in the different fonts are the extended ASCII code characters.
The first set of character codes from 020H to 07FH (**ASCII**) is common to all Panels.
The second set of character codes from 080H to 0FFH (**extended ASCII**) displays different characters according to the kind of Panel:
- For the series IPG Panels the second set of codes displays the **FONT - CET** (see table, chapter 13).
- For the series IPT Panels the second set of codes displays the **FONT - LCD** (see table, chapter 14).

7.1.3. NATIONAL VERSIONS

To meet the needs of specific characters of national versions, you can display on the Panel every kind of character.
On the IPG Panels you can simply use the **font User** and personalize the national version using the characters in ASCII codes.
On the IPT Panels you should indicate the kind of font required on the LCD display in the order code of the instrument and therefore load the specific **font - LCD** in the programming stage and manage the extended ASCII codes.

7.2. PAGE WITH FUNCTIONS

A **PAGE WITH FUNCTIONS** is a **TEXT** page plus displaying, modification, preset or date - time **FUNCTIONS**.
A **FUNCTION** is a data interchange process between the O.P. and the PLC.
It consists of a **FIELD** and a **VARIABLE**.
The **VARIABLE** is the **PLC SETTING** where reading or writing is performed**.**
The **FIELD** is the variable displayed on the Panel.
On a page up to **32 Functions** can be programmed.
There are four kinds of Function:

1) **Display** Function **(read only).**
2) **Modification** Function **(read and write).**
3) **Preset** Function **(write only).**
4) **Date - Time** Function **(read only).**

The Pages with functions can be: **Alarm** Pages, **"Titles"** Pages, **Slave** Pages, **Status** Pages.

7.2.1. DISPLAY FUNCTION

The variable is **CYCLICALLY** read in the PLC and displayed in the dialogue box of the display according to the mode programmed with CETPRO 3 programme.

7.2.2. MODIFICATION FUNCTION

The variable is read and cyclically displayed in the dialogue box of the display (as in visualization); therefore it can be modified by **VARIABLE EDITING** and written in the PLC.

7.2.3. PRESET FUNCTION

The value of the variable programmed with CETPRO 3 programme is transferred in the PLC memory in different ways according to the programming:

a) **IMMEDIATE** mode: as soon as the page containing this function is recalled, the programmed value is transferred in the PLC memory (for Word operators).
b) **ENTER:** the **ENTER** key must be pressed to activate the value transfer.
c) **IMPELLING**: in case of Preset of a variable in Bit format, the value (0 or 1) is transferred to the variable pressing the **ENTER** key. Releasing the key the variable returns to the previous value (for Bit operators).

7.2.4. DATE - TIME FUNCTION

This function is only aimed to display on the Panel date, time or both of the Real Time Clock, **RTC,** of the O.P. (not available for HPT) as programmed with the CETPRO 3 programme. The displayed date - time format is as follows:

DATE	**GG / MM / AA**
TIME	**HH : MM : SS**

GG= Day **MM**= Month **AA**= Year
HH= Hours **MM**= Minutes **SS**= Seconds

Note: this function is not available for HPT series.

7.2.5. DISPLAYING OR MODIFYING VARIABLE FIELD

*** * * * ***	Display Field
@@@@@	Modification Field

"**VARIABLE FIELD**" means the Panel display portion on which it is visualized. The **field** size is defined in the programming stage **CETPRO 3** and above all by the number of " ***** " or " @ " depending whether the function is **display** or **modification** (no field is related to the **PRESET** function).

1 2 3 4 5	Display
1 2 3 4 5	Modification

"**FIELD VALUE**" is the value displayed in the FIELD.
NOTE: remember to distinguish the "**FIELD VALUE**" displayed in that moment by the "**SETTING VALUE**" in the PLC memory, since they do not always coincide.

7.2.6. VARIABLES

Variables are the data referring to the PLC settings. A variable is always a binary datum **such as**:

byte = 8 bit
word = 16 bit
double word 32 bit

Referring to the visualization **FORMAT** it can be:

Decimal
Hexadecimal
Binary
Decimal plus sign
Decimal plus sign complement to 2
BCD
Displayed Bits
Modified Bits
Strings
Histograms
Positional
ASCII
CLOCK-BIT

7.2.6.1. VARIABLE IN DECIMAL FORMAT

Timer 10 = **13**

The variable is displayed in DECIMAL format:
Ex. PLC SETTING value = 00001101 ⇒ 13 displayed in decimal.
Since the variable is an 8-bit variable, the maximum length of the field is 3 digits (0-255) *** * *** o @@@

7.2.6.2. VARIABLE IN HEXADECIMAL FORMAT

Timer 10 = **0D**

The same variable is displayed in HEXADECIMAL:
Ex. PLC SETTING value = 00001101 ⇒ 0D displayed in hexadecimal.
Since the variable is an 8-bit variable, the maximum length of the field is 2 digits (0-FF) *** *** o @@**.**

7.2.6.3. VARIABLE IN BCD FORMAT

Timer 10 = **37**

Ex. PLC SETTING value = 00110111 ⇒ 37 displayed in BCD
Since the variable is an 8-bit variable, the maximum length of the field is 2 digits (0-99) *** *** o @@**.**

7.2.6.4. VARIABLE IN BINARY FORMAT

WORD 11 = **0 0 0 0 0 0 0 1 0 0 0 0 1 1 0 1**

Ex. PLC SETTING value = 0000000100001101 ⇒ 0000000100001101 displayed in binary
The value is displayed as it is read on the PLC.
Since the variable is a 16-bit variable, the maximum length of the field is 16 digits.
*** * * * * * * * * * * * * * * * o** @@@@@@@@@@@@@@@@.

7.2.6.5. VARIABLE IN SIGNED 1 FORMAT

It allows you to display the datum in decimal plus sign (for the PLCs enabling it) reading the most significant bit of the setting according to the condition 0 = + and 1 = - .

Counter 36 = **- 2**

The variable is displayed in decimal plus sign.

Ex. REGISTRO PLC = 1000000000000010 ⇒ -2 displayed in decimal
Since the variable is a 16-bit variable, the maximum length of the field is 6 digits (0 / +65536 e 0 -32768)
*** * * * * * o** @@@@@.

7.2.6.6. VARIABLE IN SIGNED 2 FORMAT

It allows you to display the datum in decimal plus sign (for the PLCs enabling it) reading the most significant bit of the setting according to the condition 0 = + e 1 = - carrying out the two's complement.

Counter 36 = **- 32766**

The variable is displayed in decimal plus sign.

Ex. REGISTRO PLC = 1000000000000010 ⇒ - 32766 displayed in decimal
Since the variable is a 16-bit variable, the maximum length of the field is 6 digits (0 / +65536 e 0 -32768)
*** * * * * *** o @@@@@.

7.2.6.7. BIT VARIABLE

INPUT BIT 0 DB 10 = **ON**

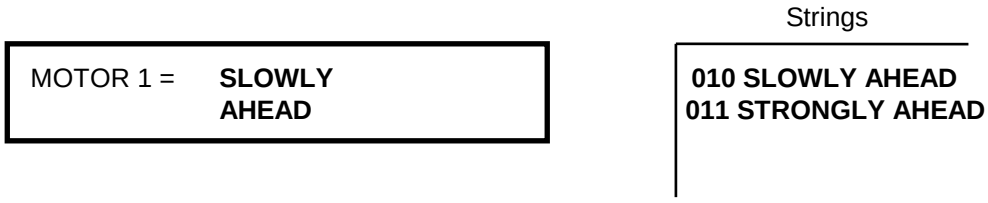
Two strings are related to a variable bit:
- the first one displaying the 0 status of the bit.
- the second one displaying the 1 status of the bit.

7.2.6.8. STRING VARIABLES

The **binary DECODING** of the first eight Bits (Bit 0 - Bit 7 for 256 combinations maximum) of the setting is related to the **STRING** set stored on the Panel.
Decoding exceeding 256 always recall the 256th string.
The maximum length of a string in memory is forty digits; however, a displayed string is never longer than the field.

MOTOR 1 = **AHEAD**

Ex: string n°10: **SLOWLY AHEAD**
field : *** * * * * ***
the first 6 characters are taken since the field has 6 stars (*).
A string can be displayed either **HORIZONTALLY** or **VERTICALLY**. In the latter the string is subdivided in many string lengths as long as the field and occupies as many lines as it has been programmed with the CETPRO 3 programme.



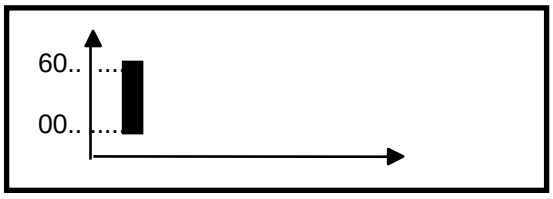
Ex: string n°10: **SLOWLY AHEAD**
vertical : *** * * * * ***
field = **2**
the first 6 characters are taken for the first line and the following 6 for the second.
The maximum number of strings stored on the Panel is 1000 in the case that their maximum length is 40 digits.

7.2.6.9. VARIABLES IN HISTOGRAM FORMAT

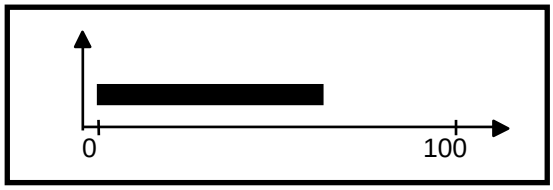
An **HISTOGRAM** is the **GRAPHIC** representation of a setting value.
An histogram can be either **HORIZONTAL** or **VERTICAL** and the space it occupies on the Panel display is defined during the programming stage with the programme **CETPRO 3**.
An histogram displays a maximum **SEGMENT** on the display when the setting acquires the **MAXIMUM VALUE PROGRAMMED** with the programme **CETPRO 3**. The intermediate values are performed on the Panel displaying intermediate segments of **different GRANULARITY according to whether the Panel is IPT or IPG.**
The width of an histogram depends on the field width, that is on the number of ***** entered during the programming stage.

note: the MAXIMUM PROGRAMMED VALUE cannot exceed 1000.

Example of a vertical histogram on a field consisting of 1 star.
Height = 3
Maximum Value = 60.



The variable at 0 value is displayed by a null segment and at 60 value by a 3-character high and 1-character wide segment.
Example of horizontal histogram on a field consisting of 20 stars.
Height = 1
Maximum Value = 100.



The variable at 0 value is displayed by a null segment and at 100 value by a 1-character high and 20-character wide segment.

7.2.6.10. POSITIONAL VARIABLE

A **POSITIONAL VARIABLE** is a string variable related to the **POSITION** of each bit in the PLC setting, beginning from the least significant. The 0 value displays the first string.

Word 10 = 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 **Motor 2 ahead**

Strings
010 Stopped Motors
011 Motor 1 ahead
012 Motor 2 ahead
013 Motor 3 ahead

Example: variable **displaying** Word 10 in positional.
- string 10 leading end.
- bit number 16

The first bit at 1 of Word 10, from right is the third; beginning from 10 the fourth string is therefore displayed .
For many bits simultaneously at 1, the string of the least significant bit will be displayed.

Motor 3 ahead Word 10 = 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0

Strings
010 Stopped Motors
011 Motor 1 ahead
012 Motor 2 ahead
013 Motor 3 ahead

Example: variable in Word 10 **modification** in positional.
- string 10 leading end.
- bit number 16

Using the keys ⇑⇓ or **+** and **–** select the string from 10 to 26 in the modification field.
Pressing **ENTER** you can select the third string.
Pressing **ENTER** twice the third bit of Word 10 of PLC is forced to 1 and all the others to 0.
Even in this case, the string can be displayed either HORIZONTALLY or VERTICALLY; the same rules previously described for the string variables apply.

Note: forcing the Word value to 0 the first string will be displayed (Motors Stopped).

7.2.6.11. VARIABLE IN ASCII FORMAT

The ASCII variable both in modification and in displaying is represented by the **ASCII** characters from the 20H code to the 7FH code. Codes out of this gap are displayed with "**?**". A character in ASCII occupies 8 bit; for this reason 2 ASCII characters can be allocated in a WORD .
The PLC setting is read or written beginning from the variable address, and for as many bytes (8 bit settings) as the amount of digits in the ASCII field.

PASSWORD = **?? ?? ??**

Example: if you wish to insert the PASSWORD **"AD 12 78" programmed with the CETPRO 3 programme** in the Word 10 setting of the PLC.

- the modification field ASCII format consists of @@@@@@.
- Word PLC address = 10
- number of bytes written on the PLC = 6

PASSWORD = **AD 12 78**

Entering the modification field edit the AD 12 78 code and therefore press **ENTER** to confirm.

Pressing **ENTER** twice, the AD 12 78 code is transferred to the PLC; in particular write 41H(A) at the Word 10 - 8 low bit address, 44H(D) at the Word 10 - 8 high bit address, 31H(1) at the Word 11 - 8 low bit address, 32H(2) at the Word 11 - 8 high bit address, and so on.

7.2.6.12. VARIABLES IN CLOCK- BIT FORMAT

This function is used to create semigraphic characters moving on the Panel display.
It is a bit variable and can, therefore, have a value either **0** or **1.**
When the value is 1 some programmed strings are displayed, beginning from the second, with 300-millisecond clock rate; when the value is 0 the first programmed string is displayed.

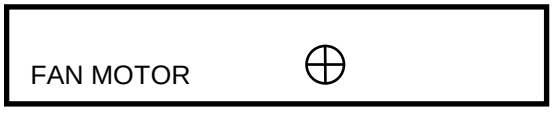
Example: if you wish to display an image which simulates motor fan rotation:

- - address PLC = Word 10 bit 1
- - string leading end 20
- - number of strings = 4

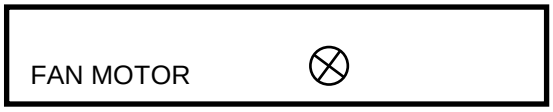
When the bit 1 of Word 10 is = 0 you have:

Strings
020 STOPPED
021 A
022 B
023 C
024 D

When the bit 1 of Word 10 goes to 1 you have:



The first step displays **string 21**



The second step (after 300 ms) displays **string 22** and so on until the 24th and then returns to string 21.
Note: if the characters needed to simulate the movement, that you wish to display, do not exist among the font, you should create them in the **font user** as follows.

Example:

A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
41H	42H	43H	44H	45H	46H	47H	48H

The font user is modified as follows:

⊕	⊗	⊗	⊗	**E**	**F**	**G**	**H**
41H	42H	43H	44H	45H	46H	47H	48H

Referring to the above-mentioned example, the selected strings will refer to these 4 types.

In order to have the ⊕ character corresponding to string 20 “A” on the display, you should attach the “**font user name”** to the **clock-bit field** during the programming stage.

7.2.7. CONVERSION FACTOR AND VARIABLE LIMITS

The minimum and maximum limits of a variable are the extreme values between which it can vary. During the programming stage the minimum and maximum limit are defined on the Panel as well as on the PLC. The ratio between the two defines the **conversion factor.**
The **conversion factor** allows you to multiply or divide the value contained in the PLC settings by the value displayed on the O.P.

- If they are the same, no conversion takes place.

Example:

Word 10 minimum limit on PLC = 10 Word 10 minimum limit on Panel = 10
Word 10 maximum limit on PLC = 100 Word 10 maximum limit on Panel = 100

- If they differ the conversion takes place.

Example:

Word 10 minimum limit on PLC = 10 Word 10 minimum limit on Panel = 20
Word 10 maximum limit on PLC = 100 Word 10 maximum limit on Panel = 200

The conversion factor multiplies by 2 the value read by the PLC before displaying it on the Panel.

7.2.8. VARIABLE DECIMAL

If you wish, for example, either display or modify a variable with some decimal digits, enter in the field the separator character chosen among those available: **" . " " , " " ; " " : " " / " " _ "**.
In each field all the separator characters that you wish can be entered, as long as they are not contiguous.

Example:

Display field :	***.***	***.****	****/**.***
Value in the PLC:	**32**	**321**	**32158**
Visualization on the display:	**3.2**	**3.21**	**32/15.8**

The separator character " _ " is read by the Panel as a free space and therefore it is not displayed.

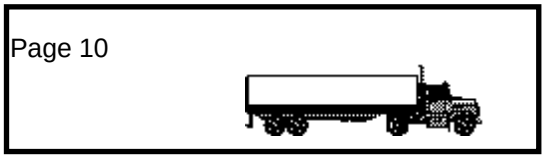
Example:

field: \		***.**_***
value: \	**3215**	
visualization		**3.21 5**

7.3. PAGE WITH GRAPHICS

7.3.1. STATIC GRAPHICS

Referring to the Panels with graphic display (IPG series) the message may include graphic images for a maximum of 8 per page and the keys can be written using the 8 different available fonts.



Graphics can occupy the whole display and superimpose on text.

The display has a graphic layer, or background page, with dot matrix and the following size:

240 x 64 pixel for IPG106
240 x 128 pixel for IPG208
320 x 200 pixel for IPG240

Each pixel can have only 2 hues:

VIVID (White)
PALE (Black)

Therefore the graphic images that can be displayed by the Panel must be created as black and white images with 2 colours. The pages can be created by a programme in bitmap format, such as PAINT (Windows) available in all the latest PCs, which saves the files with BMP extension.
In the drawing stage, remember to establish its size through the programme used, allowing for the size of the display, which you are going to use and described at the beginning of the paragraph.

7.3.2. MOVING GRAPHICS

The graphic layer of the display is static; if you wish to create moving images you must use dynamic variables and the personalized font.

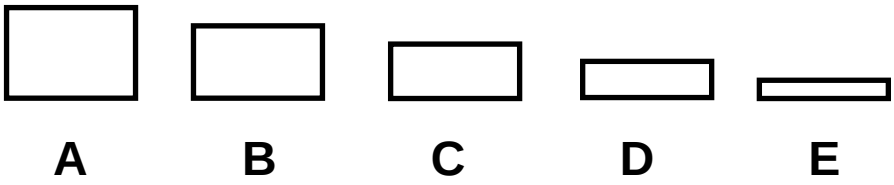
Example of a moving part, changing its size.

The function should relate some strings either to a variable or to a clock-bit.

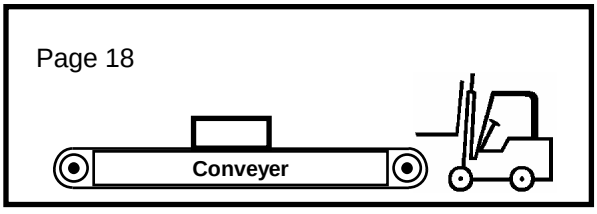
S T R I N G S

10	A
11	B
12	C
13	D
14	E
15	F
16	G

The setting of the function field must be as font-user in the CETPRO programme.
The font-user should be modified as follows:



The Panel will display the part running on the conveyer and becoming increasingly lower as it moves towards the right.



This example shows static graphic images plus moving graphic images.

7.4. “TITLES” PAGES

These are Function Pages recalled by a Function Key programmed as Title Key, with the single exception that they cannot recall Slave Pages.
The Title of a Title Page is not shown on the page itself but on the Title list recalled by the “Titles” Key.

Press the Clear Key to close a Title Page.

7.5. SLAVE PAGES

These pages contains Functions recalled by a Slave key. A Slave page cannot recall another Slave page.

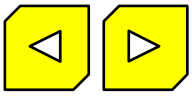
7.6. VARIABLE EDITING AND MODIFICATION

The **NUMERICAL** and **ALPHANUMERICAL VARIABLES** can be edited on the O.P. firstly **MODIFYING** the **VALUE IN THE FIELD** and then transcribing the new value in the PLC setting:

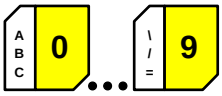
This key enables the variable editing: the cursor changes shape (▢) becoming the **FIELD** edit **CURSOR**.

Step 1 

Shift the cursor inside the field.

Step 2 

Numerical and alphanumerical characters to modify the value of the field. Modifications are always **SUPERIMPOSED**.

Step 3 

Closes the field without saving the edited value and restoring the last value before opening the edit.

Step 5 

Closes the edit saving the new value of the field.

Step 6 

Enhances the value of the variable.

Step 4 

Decreases the value of the variable.

At this point the value **flashes** on the display, which means that the field has been modified but it has not been transferred to the variable.
Pressing the ENTER key, the modified field (as well as any other “flashing” fields) is written in the PLC setting. The **FIELD VALUE** and the **REGISTERED VALUE** coincide. All the transferred fields are displayed again in the usual way.

Step 7 

N.B. :

1) if a page contains various modification fields, the Panel can be programmed (through CETPRO 3) in order to simultaneously transfer either all the fields or only the modified one to the PLC.

2) if programmed with CETPRO 3 software, the data insertion in to PLC it's doing with one ENTER only: the step 6 and step 7 are the same.

8. BENCH PROJECT

During the Programming on CETPRO the memory of the Pages and of the Strings can be subdivided into:

1 BENCH
2 BENCHES
3 BENCHES
4 BENCHES

If only one bench has been selected, all the Panel memory can be used to display the programmed Pages and Strings.
Vice-versa, if the number of Benches is greater than one the Panel memory is subdivided in order to have the same number of Pages on each Bench.
Taking for example an **IPT102**, according to the number of Benches, the Pages are subdivided as follows:

Benches	1 Bench Selected	2 Benches Selected	3 Benches Selected	4 Benches Selected
BENCH 1	From string 0 to 999	From string 0 to 249	From string 0 to 249	From string 0 to 249
BENCH 2		From string 250 to 499	From string 250 to 499	From string 250 to 499
BENCH 3			From string 500 to 749	From string 500 to 749
BENCH 4				From string 750 to 999

The strings are subdivided according to the following table:

Benches	1 Bench Selected	2 Benches Selected	3 Benches Selected	4 Benches Selected
BENCH 1	From page 0 to 1299	From page 0 to 649	From page 0 to 432	From page 0 to 324
BENCH 2		From page 650 to 1299	From page 433 to 867	From page 325 to 649
BENCH 3			From page 866 to 1299	From page 650 to 974
BENCH 4				From page 974 to 1299

Note: for the HPT panel the maximum number of strings depends on the available Flash memory (16Kbyte), and CETPRO considers this limit during the programming stage.

On the first bench there are the Pages that are really available for the Project, since those on the following benches are mirror pages of those referring to the Functions, although with different text.
The same can be said referring to the Strings: only the strings on the first bench can be related to the Functions.
Dividing a Project into Benches is therefore used to alternate Pages or Strings with the text in a certain Language with the text in another Language.

Example of a project on IPG102 with 2 Benches:

Bench 1

page 12

⇐ String 15

Bench 2

page 662

⇐ String 515

The Bench is chosen on the Panel using the command on the Menu, as described in the relevant chapter.

9. RECIPES

The **Recipe** consists of a number of **PARAMETER SETS** that can be established with the CETPRO 3 programme.
Each parameter consists of a number of **VALUES** each called **INGREDIENT**; the **maximum number of recipes** that can be controlled by an O.P. is **100**. Each **RECIPE** is defined by a **NAME** with a maximum of 10 digits.

9.1. INGREDIENTS

INGREDIENTS of a Recipe are the values transferred to the PLC memory and defined by a **NAME**, with a maximum of 10 digits, using the "CETPRO 3" programme during the programming stage, to define the value of one set of parameters. The maximum number of ingredients of a **Recipe** is **100**.

9.2. PARAMETER SET

SET of **PARAMETERS** of a Recipe is the mixture of the ingredients and can be defined by a **NAME** with 10 digits. The maximum number of parameter sets of a Recipe is **100**.

9.3. VALUE

VALUE is the datum to transfer to the PLC: it is always a **16 BIT WORD** .

9.4. ADDRESS OF THE RECIPE

It is to the **ADDRESS** of the first **PLC SETTING** that the first ingredient of the parameter set refers.
The number of PLC settings involved in a Recipe is therefore the number of ingredients. The PLC address is established during the programming using the CETPRO 3 programme.
Example of a Recipe.

Recipe Name: **BREAD**

INGREDIENTS	**PARAMETER SET**			
	Common	With Oil	"Pugliese"	Elaborate
FLOUR	1000	1200	800	900
WATER	200	150	240	40
SALT	70	80	60	10
YEAST	50	50	60	5
OIL	150	100	200	200

Recipe Address: Word 10
The Recipe is read or written on the PLC beginning from Word 10 to which the first "FLOUR" is related. The second ingredient "WATER" is related to the following Word, Word 11 of the PLC and so on.

9.5. RECIPE ON THE PANEL

The recipes on the O.P. are first programmed using the CETPRO 3 programme and then stored **on the Panel** until the memory is complete. The size Recipe (in Word) is defined by:

n° of INGREDIENTS x PARAMETER SET

Although there are 100 available recipes it is impossible to store 100 x 100 x 100 Words. The Panel will therefore accept some recipes, up to a **maximum total amount of 32768 Words including: recipe names, parameters and ingredients.**

CETPRO 3 programme however provides all the needed information to meet the requirements.

9.6. RECIPE ON THE PLC

A set of parameters of a recipe can be either **READ** or **WRITTEN** from the Panel towards the PLC.
The set of parameters consists of a maximum of 100 Word, in a contiguous storage location during the PLC programming. The recipe address in the Panel is addressed to the first location of this memory area.

Example: **Programming BREAD Recipe on the Panel with CETPRO3:**

Address Recipe = Word 10
Number of Parameter Sets = 20
Number of ingredients = 50

Programming BREAD Recipe on the PLC:

The BREAD Recipe data can be retrieved from word 10
to word 60 of the PLC storage location.

9.7. COMMANDS RELATED TO THE RECIPE ON THE O.P.

The Panel can carry out the following commands:

- recall from its non volatile memory a Set of Parameters of a displayed Recipe
- select a new set of parameters on the Panel
- modify or create a Set of Parameters of a Recipe and store it on its own non volatile memory
- transmit to the PLC the Set of Parameters of a displayed Recipe
- receive from the PLC a Set of Parameters and store it on its own non volatile memory.

9.8. Recall of a Recipe on the O.P.

A Recipe on the Operator Panel can be recalled as follows:

1) **from Recipe key:** during the O.P programming stage, the Recipe Key feature is given to one or more Function keys; pressing that Key the O.P. recalls therefore on the display the relevant Recipe.
2) **from the Menu:** pressing the Menu Key, enter the menu status and select RECIPES; then run through the list of the Recipes stored in the Panel and select the desired Recipe.
3) **from Communication Image** (not implemented)

9.8.1.1. Recall of a Recipe from a Function Key

A Function Key programmed as Recipe Key enables you to recall the Recipe related to it.
The key ⇐ of the Panel keyboard shifts the cursor on the number of the Set of Parameters.
The keys **+** and **–** or the keys of the numerical pad select the number of the set of parameters.
Press the **ENTER** key to recall the parameter set on the Panel.
Press the **SHIFT +** ⇐ keys to transfer the whole set of parameters to the PLC.

N.B. **While a recipe is opened by a Function Key, a page from Communication Image cannot be opened; the recipe must first be closed either using the 23 command or pressing the key itself.**

9.8.1.2. Selection of a Recipe from the Menu Key

The **"0"** key recalls the Recipe name on the first line of the display.
Press the ⇐ key to shift the cursor on the Recipe number.
The keys **+** and **–** or the keys of the numerical pad select the Recipe number.
Press the **ENTER** key to recall the Recipe on the Panel.

N.B. While a recipe is opened by a Menu Key, a page from Communication Image cannot be opened; the recipe must first be closed either using the 23 command or pressing the key itself.

9.8.2. Panel Selection of a new set of renamed parameters

Press the **SHIFT + INS** keys to recall the first empty set of parameters - if any -.
The above-described procedures enable you to write the values directly from the keyboard or read them from the PLC, and therefore store them on the Panel using the **SHIFT + ENTER** command.
Even the name of the set of parameters is editable simply shifting the cursor on the number of the set of parameters and pressing the **SHIFT +** ⇒ command to edit the name using alphabetical characters.

9.8.3. Modifying a Recipe on the Panel

A Recipe displayed on the O.P.is as follows:

RECIPE 01-01	COMMON	SET
FLOUR	1000	1000
WATER	200	200
SALT	70	70
YEAST	40	40
OIL	150	150

The first line shows the Set of Parameters or the Recipe name: the **"0"** key alternates the two.
Selecting the set of parameters the word "SET" appears. The two numbers that follow the word "RECIPE" show: the first on the left the Recipe number and the second the number of the set of parameters.
The first column on the left shows the Ingredient names. The second column shows the values of the ingredients on the PLC, whereas the third shows those on the Panel.

9.8.4. RECIPE name on the Panel

Pressing the "0" key the Recipe name is displayed in place of the name of the Set of Parameters.
Pressing the "0" key twice the name of the Set of Parameters is confirmed.

The ⇑⇓ keys shift the cursor on the value to be modified.
Press the **INSERT** key to enter edit to modify the value.
The keys **+** and **–** or the keys of the numerical pad insert the new value.
Press the **INS** key to close the edit step. The modified field flashes.
Press the **SHIFT + ENTER** keys to enter the new value in the O.P. The field returns to normal (not for HPT)
Press the **SHIFT +** ⇐ keys to transfer the whole set of parameters to the PLC.

9.8.5. Selection and transmission of a set of parameters to PLC

The **"0"** key recalls on the display the name of the current set of parameters.
The ⇐ key of the keyboard Panel shifts the cursor on the number of the Set of Parameters.
The **+** and **-** keys or the keys of the numerical pad select the number of the set of parameters.
Press the **ENTER** key to recall the set of parameters on the Panel.
Press the **SHIFT +** ⇐ keys to transfer all the set of parameters to the PLC.

9.8.6. Reading a set of parameters from the PLC and storing on O. P.

The Panel can **READ** a set of parameters from the PLC and store it in one of the Recipes in the O.P. memory If the operator thinks that he will carry out this operation, during the programming stage, he should remember to prearrange the Recipe with an empty set of parameters, which will be filled while reading it from the PLC.
The Panel can also **SUPERIMPOSE a set of parameters read from the PLC on an existing one.**
Press the **SHIFT +** ⇒ keys to read the set of parameters from the PLC, displayed on the right column of the values. Press the **SHIFT + ENTER** keys to write the new values in the Panel. This writing can be carried out even superimposing on the values of an already existing set of parameters.

10. DATE AND TIME

All the IPT and IPG panels (not available on HPT) are provided with RTC (Real Time Clock) to display date and time.
The RTC Set comes from the menu as in the previous chapter.
Furthermore, the RTC can be read through the Communication Image.
All the available fonts can be used for the graphic Panels of date and time.

11. ALARMS

Alarms are **ASYNCHRONOUS EVENTS** detected by the O.P. on the PLC, causing visual signalling on the Panel. The alarm communication from the PLC takes place through the **Alarm Communication Image** .

11.1. ALARM COMMUNICATION IMAGE

ALARM IMAGE is the second part of the **Communication Image**. Aim of this area is to provide support to control important asynchronous events, commonly called **alarms,** inside the application.
Recording all the alarm signals to a certain area, therefore called **Alarm Image**, the Panel Operator can automatically inform the operator that the system has detected an **alarming situation,** displaying the corresponding **alarm message** on the display, apart from the current work condition.

11.2. ALARMS ON PLC

The Alarm Image can be programmed using the “CETPRO 3” programme, defining the address in the PLC, where this image will be allocated. The image can consist of a minimum of 1 Word (16 alarms) and a maximum of 16 consecutive Word (254 alarms) and each bit of these Word can be related to one or more messages. Each 2 seconds the O.P. reads this image and when one of these Alarm Bits becomes effective (level 1), the Panel displays the Alarm Message related to it.

11.3. PARAMETERS OF AN ALARM

An Alarm is characterized by:

1) **NUMBER**, corresponding to the progressive Bit number of the Word in the PLC to which it is related.
2) Alarm **MESSAGE**: a text line and/or one or more text pages or one “Functions” Page.
3) Displaying **MODE**, **IMMEDIATE** or **DISCRETIONAL**.

11.3.1. ALARM NUMBER

The **maximum number of alarms** controlled by the Panel is **254** (from n°0 to n°253)

11.3.2. ALARM MESSAGE

According to the Programming an Alarm can display on the Panel:

1) a Text Line
2) a Text Line + a Text Page
3) a single Text Page
4) many Text Page
5) a Function Page

Example case **1) :**

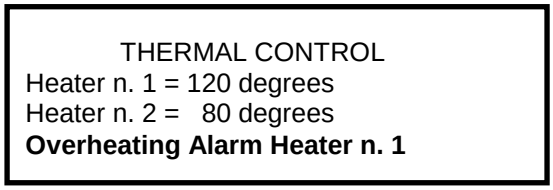
THERMAL CONTROL Heater n. 1 = 120 degrees Heater n. 2 = 80 degrees
⇒ Overheating Alarm Heater n.1 Text line

In this case the Alarm message takes up only the last line of the display, while all the display lines reduce one position upwards.

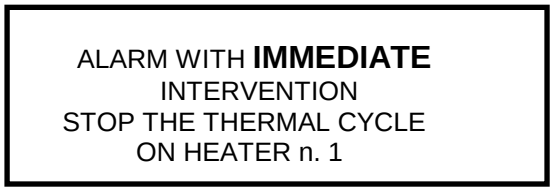
The Alarm acquisition cancels the Text line with the Alarm message recalling the other text lines in the d original position.

Example case **2)**:

As in case **1)**, plus the possibility to open one Text Page related to the Alarm.
Example of operational sequence of the acquisition of an Immediate Alarm:
- the Alarm is activated
- the text describing the event appears on the last line of the display.



- the operator presses the **ALARM** key acquiring it.
- the operator presses the **ALARM** key twice displaying Text Page related to the Alarm.



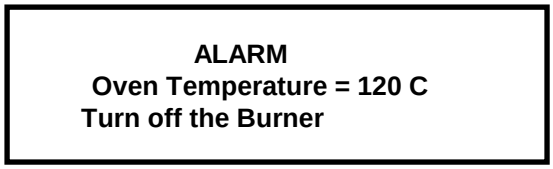
Example case **3)**:

The **Alarm Message** takes up a whole **TEXT PAGE**.
The Alarm acquisition clears the Text Page with the Alarm message and displays again the current Page.

Example case **4)**:

As in case **3)**, but with the possibility of running through many Text Pages using the arrows UP and DOWN during the Alarm acquisition.

Example case **5)**:



The Page in Display mode shows the oven temperature.
The **Alarm Message** takes up a whole **FUNCTION PAGE.** This Page has all the requirements previously described for the Pages with Functions.
The Alarm acquisition clears the Text Page with the Alarm message and displays again the current Page.

11.3.3. DISPLAY MODE

The Alarm can be programmed in two ways, according to which kind of visualization you wish to have on the display:

1) **IMMEDIATE:** the O.P. displays the alarm message as soon as the alarm is effective (on the rise front of the corresponding bit the **Alarm Led** starts flashing). Pressing the **ALARM Key** closes the function and restores the previous Panel status.
2) **DISCRETIONAL:** the **Alarm Led** starts flashing when the alarm is activated while the Panel displays the current page; the operator can decide whether to acquire the alarm with the **ALARM Key** or leave the LED flashing, still working on the current page. If the alarm bit is resetted, the alarm page open with alarm key will be close and on the display well be show the page previous by opened.

11.4. DISPLAY PRIORITY OF MANY ALARMS

PRIORITY of an alarm is the order according to which the alarm message is displayed if many alarms are simultaneously effective. The **MAXIMUM** priority depends on the number of alarms. The fewest the alarms are, the greatest its priority is and vice-versa.
Example:

Alarm n°0 = Maximum Priority
Alarm n°253 = Minimum Priority

Pressing the Alarm key you acquire the sequence of alarms according to the priority of each one.

11.5. ACQUISITION OF AN ALARM

Acquisition of an alarm means that the operator knows that there is an alarm; pressing the ALARM key cancels the alarm message from the display as well as its record in the history file.
Therefore, the acquisition of an alarm does not reset the alarm, since to reset an alarm the corresponding **BIT** in the PLC must return to **ZERO**.

11.6. ALARM INFORMATION LINE

The **ALARM INFORMATION LINE** takes up the first line on the bottom of the O.P. display and it is made up by the following string:

<< XXX :Xn,Xn,Xn >> (+)

where: **XXX** = shows the total number of Effective Alarms.
Xn = shows the number of the Effective Alarm.
(+) = shows that other alarms are present.

The alarm **INFORMATION LINE** can be recalled at any time on the O.P. display and therefore on the last line of every Page - Text or Page with Functions, through the INFO Key. In this case the displayed image rolls up of one line, for the Alarm Information Line on the first line on the bottom.
The Alarm Information Line can be recalled also from the Communication Image.

11.7. ALARM STORAGE WITH DATE AND TIME

The O.P. stores in its **NON VOLATILE MEMORY** the date and time read on the O.P. clock (not on HPT) when an alarm has been activated and above all:
a) when the alarm is activated, **code "E**" (**E**nter).
b) when the alarm is acquired for the first time, **code "A"** (**A**cquisition) (only for Immediate alarms)
c) when the alarm bit is reset in the PLC memory, **code "U"** (**U**scita - **E**xit).
The memory where the information "E", "A" and "U" are stored is called **ALARM QUEUE** or **HISTORY**. **The maximum number of events that can be recorded is 500**. If the maximum capacity of the alarm queue is exceeded, the newest data entered will replace the oldest ones.

Example:

AL: xxx / yyy N. zzz
CODE TIME DATE

Where: **xxx** = Progressive number of the event
yyy = Total number of the events
zzz = Alarm number
CODE = E, A, U
TIME and **DATE** when the even took place.

11.8. ALARM QUEUE

The << **HISTORY LIST**>> of the MENU (also available for HPT but without date and time regulation) enables you to:

a) Visualize the alarm queue
b) Visualize the relevant message pressing the **ENTER** key.

Example:

CODE	ALARM NUMBER	DATE	TIME	MODE
E	10	gg / mm / aa	hh : mm : ss	I
A	10	gg / mm / aa	hh : mm : ss	I
U	10	gg / mm / aa	hh : mm : ss	I

Pressing the **ENTER** key the last event occurred is displayed.

11.9. ALARM PRINTING

An alarm (also available for HPT but without date and time regulation) can be printed:

a) in **IMMEDIATE** mode
b) from the **KEYBOARD**
c) from **COMMUNICATION IMAGE**

- To print an alarm in **Immediate** mode the option should be activated programming the alarm text using the CETPRO 3 programme. The alarm will be immediately printed as soon as it is displayed.

- From the **KEYBOARD** three kinds of printing are available:
  - printing the alarm message when it is displayed, simply pressing the **PRINT key**
  - printing the **effective alarms** entering the **MENU**, selecting **PRINT ALARMS** and pressing twice the **ENTER key**.
  - printing the **history** entering the **MENU**, selecting the **PRINT HISTORY** and pressing twice the **ENTER key**.

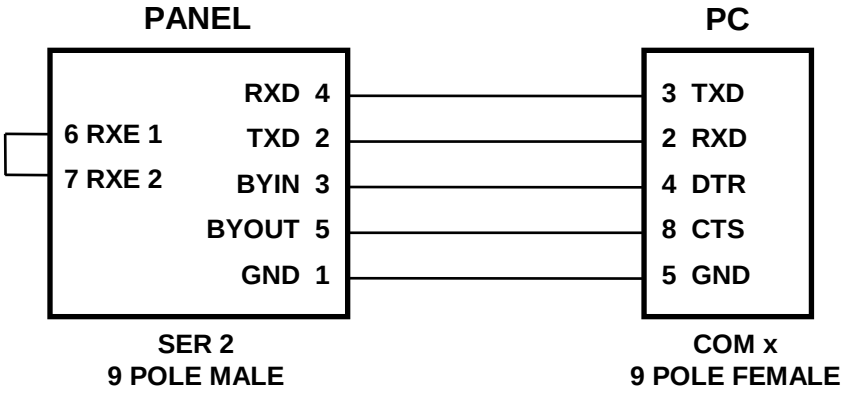
- **Communication Image** offers the same three mode, that are available from keyboard selecting in **Word 9 IC_FUN of the Communication Image** the relevant number of the desired printing.

12. CABLES

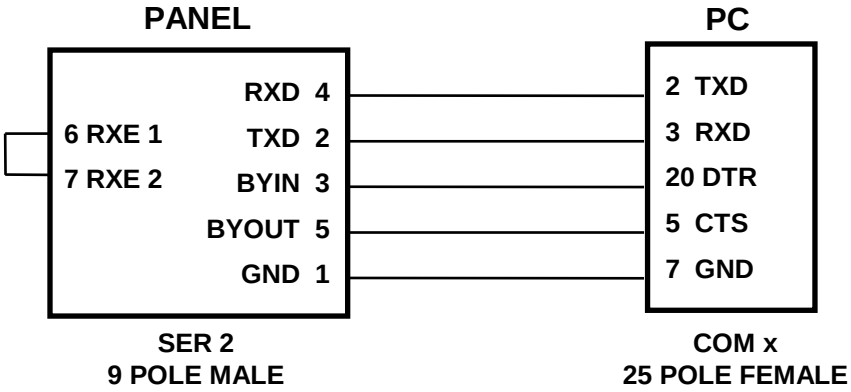
12.1. SERIAL PORT CONNECTOR SER2

The external connector **SER2** of the O.P. is used for Panel programming functions in order to receive and transmit programme functions and texts of messages as well as for printer interfacing. The possible connections with the serial port are below described: (the connectors are meant on the cable):

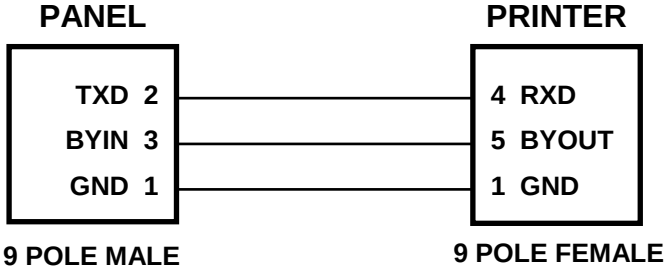
12.1.1. SERIAL CONNECTION WITH PC WITH 9 POLE CONNECTOR



12.1.2. SERIAL CONNECTION WITH PC WITH 25 POLE CONNECTOR

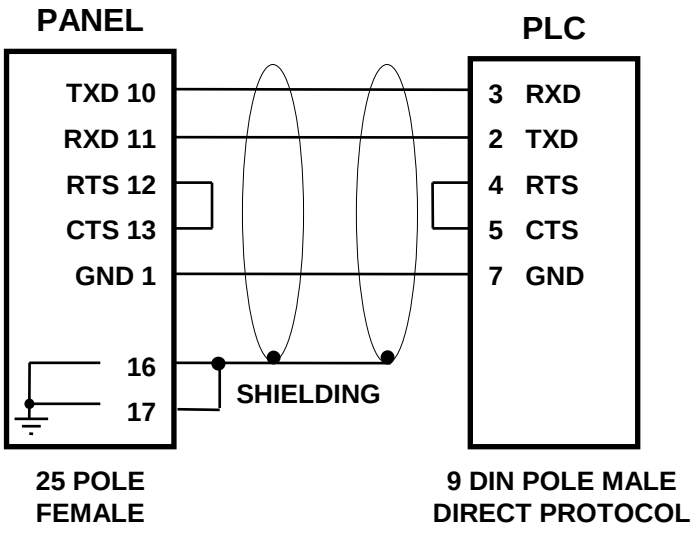


12.1.3. CONNECTION WITH SERIAL GENERIC PRINTER OR WITH CET ST40 - ST42 PRINTER

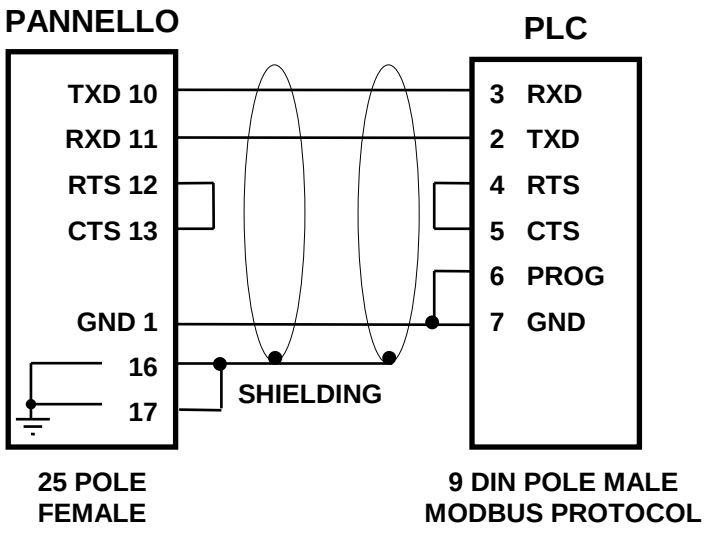


12.2. INTERFACING WITH PLC

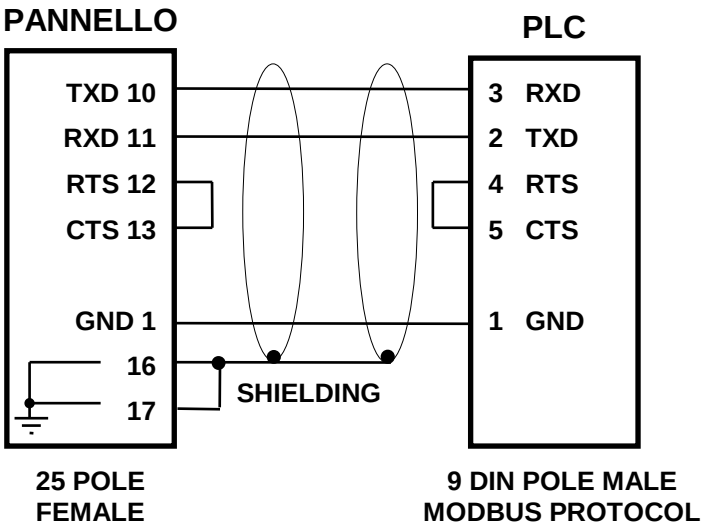
12.2.1. PLC ABB PROCONTIC CS31 WITH DIRECT PROTOCOL



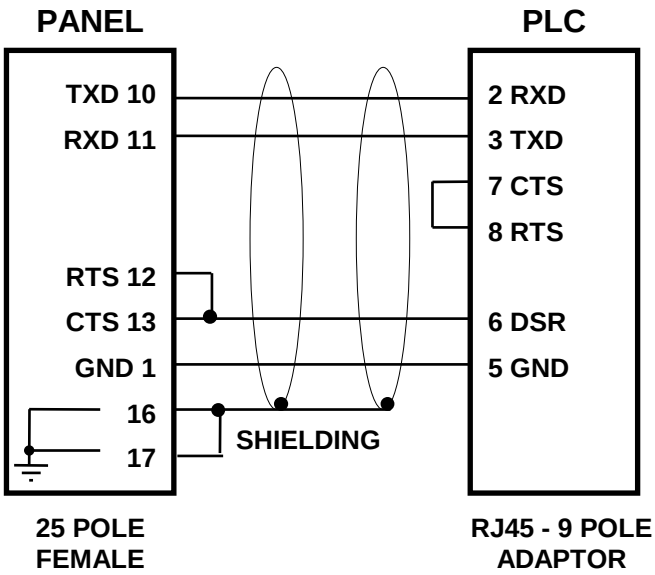
12.2.2. PLC ABB PROCONTIC CS31 WITH MODBUS PROTOCOL



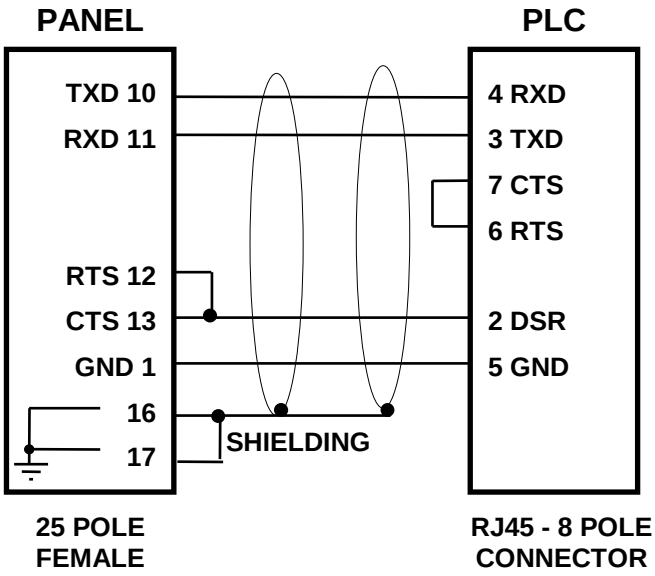
12.2.3. PLC ABB 07KT94 WITH MODBUS PROTOCOL



12.2.4. PLC AEG MICRO 311/411/511 WITH AEG ADAPTOR

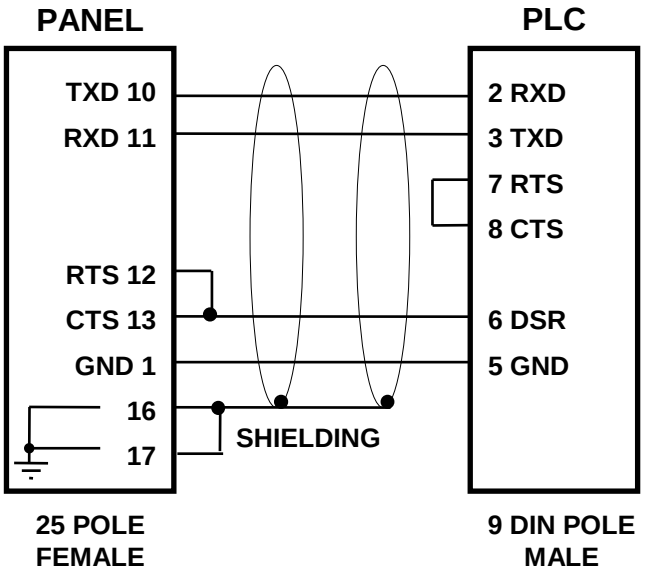


12.2.5. PLC AEG MICRO 311 / 411 / 511 RJ45 PLC CONNECTOR

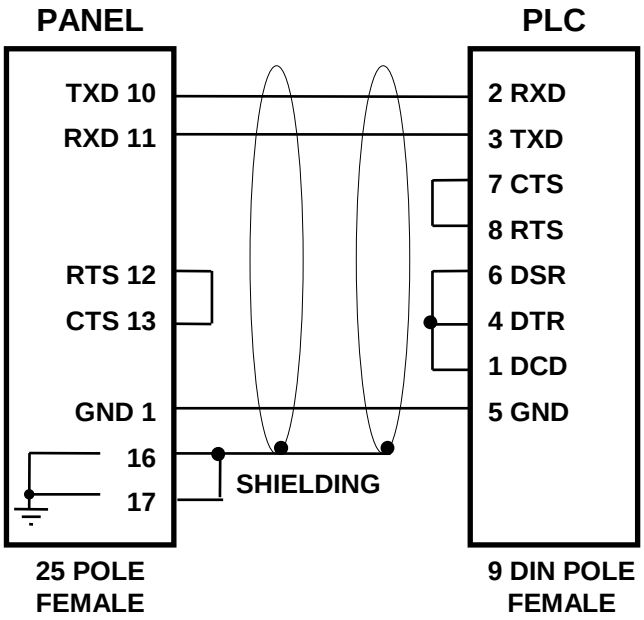


NOTE 1:
The short-circuit connection on the RTS and CTS signals towards the PLC should be carried out inside the casing on the panel side, since it cannot be physically carried out on the RJ45 connector.

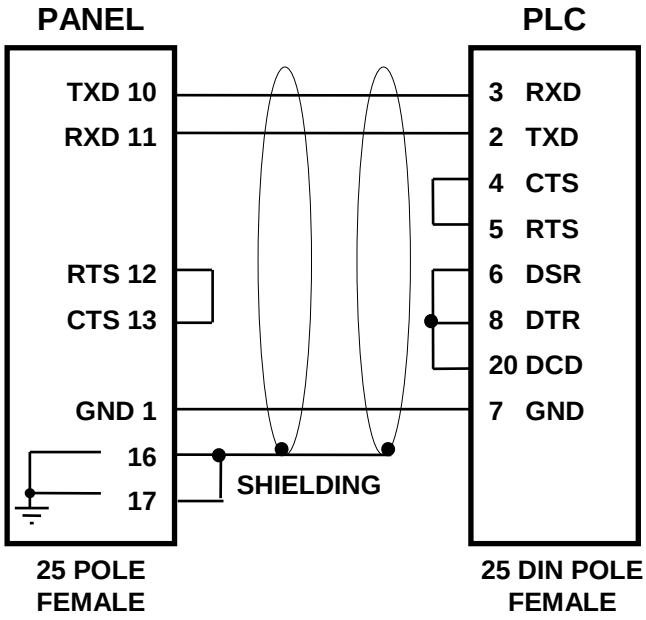
12.2.6. PLC AEG MICRO A984-131



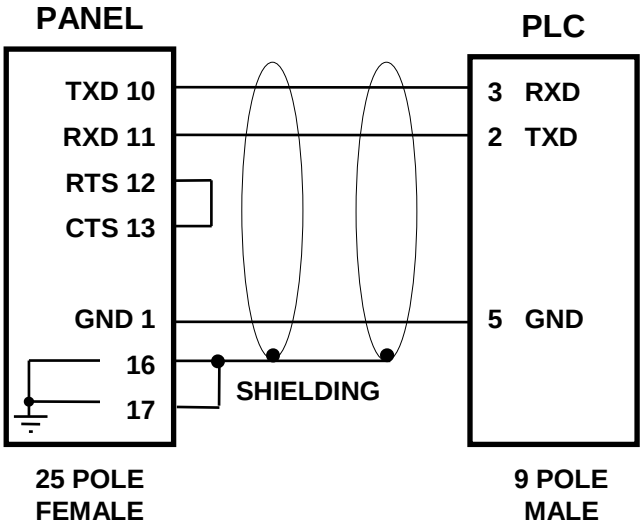
12.2.7. PLC ALLEN BRADLEY SLC 5 / 03



12.2.8. PLC ALLEN BRADLEY 5/60

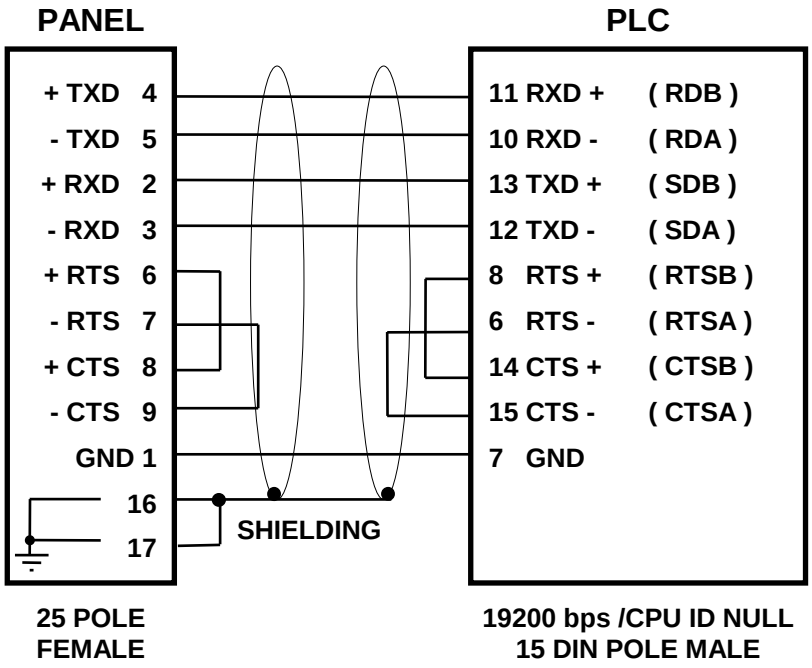


1.1.1. PLC ALLEN BRADLEY MICROLOGIC

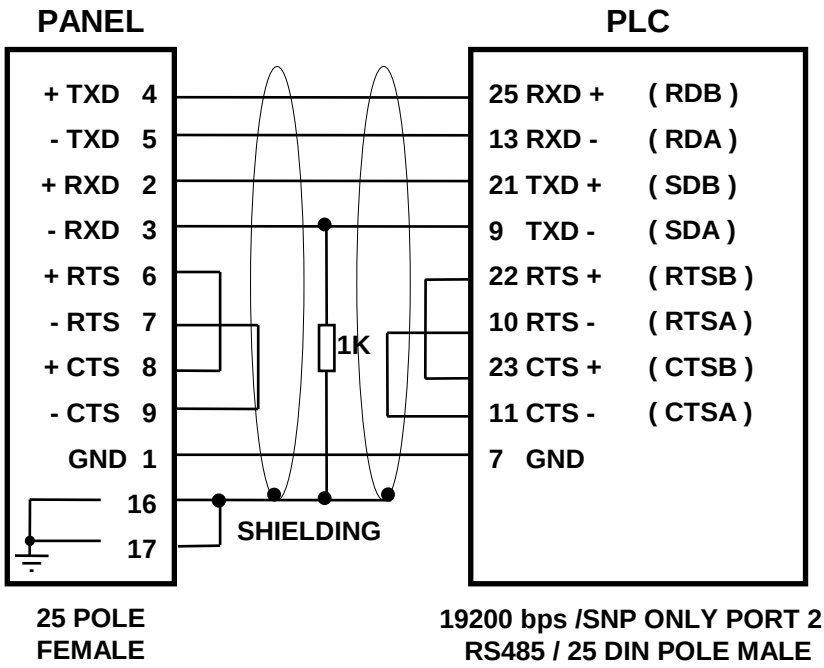


N.B. The connection with the PLC is made by the cable supplied by the same PLC.

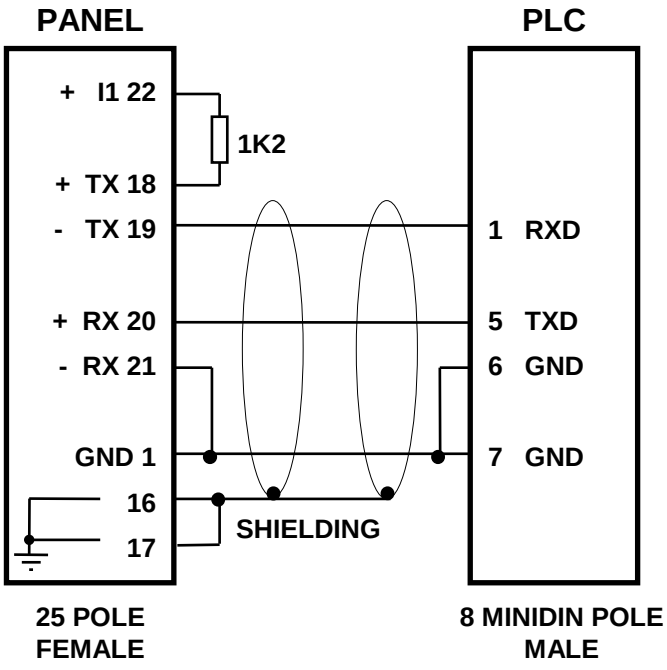
12.2.9. PLC CGE SERIES 90 / 30 PRG PORT

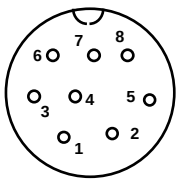


12.2.10. PLC CGE SERIES 90 / 30 CMM 311



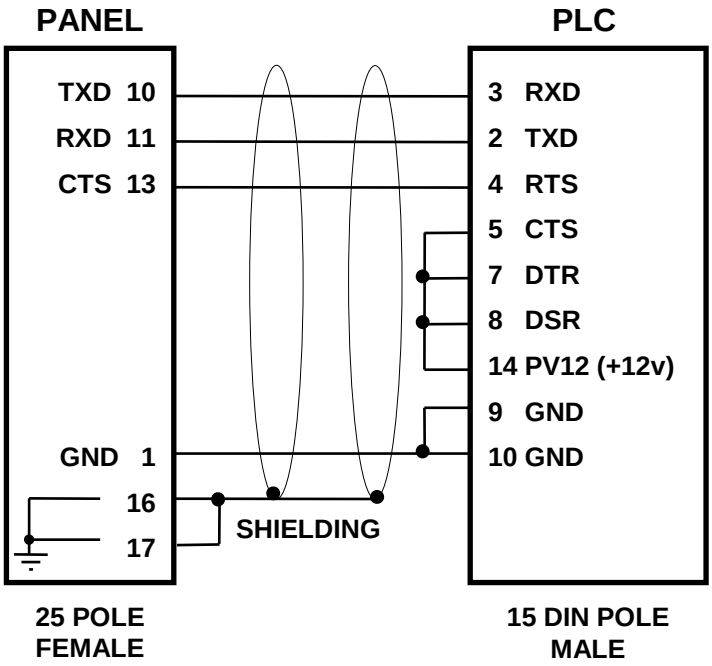
12.2.11. PLC CROUZET RPX 10 / RPX 20 / RPX30 PROGRAMME PORT



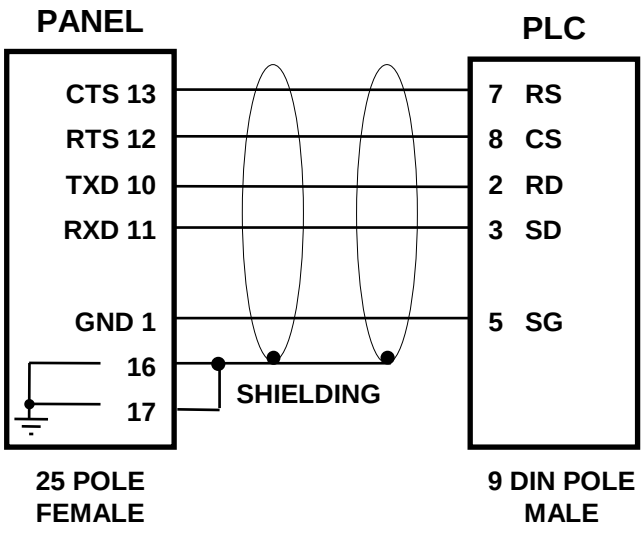


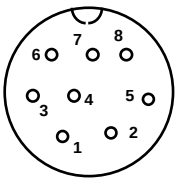
8 MINIDIN POLES
MALE CONNECTOR
FRONT VIEW

12.2.12. PLC HITACHI H200

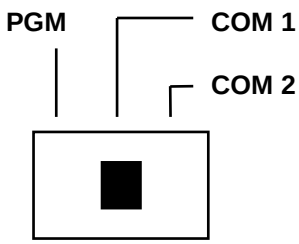


12.2.13. PLC HITACHI EC COM 1

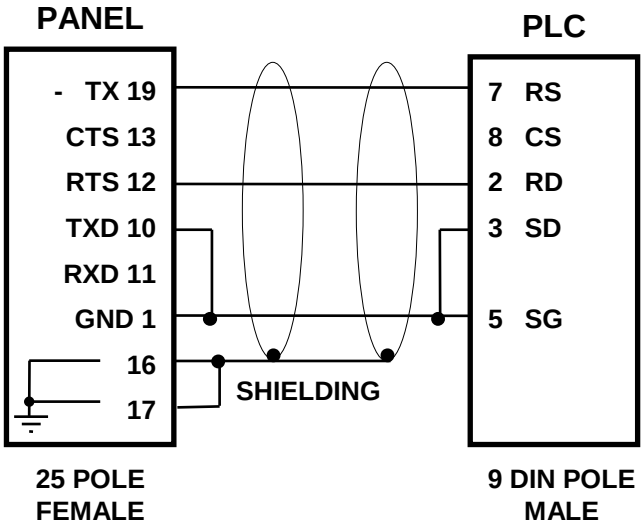


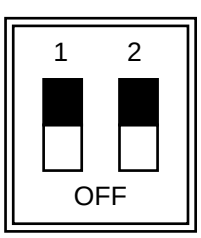


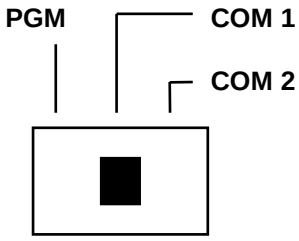
8 MINIDIN POLES
MALE CONNECTOR
FRONT VIEW



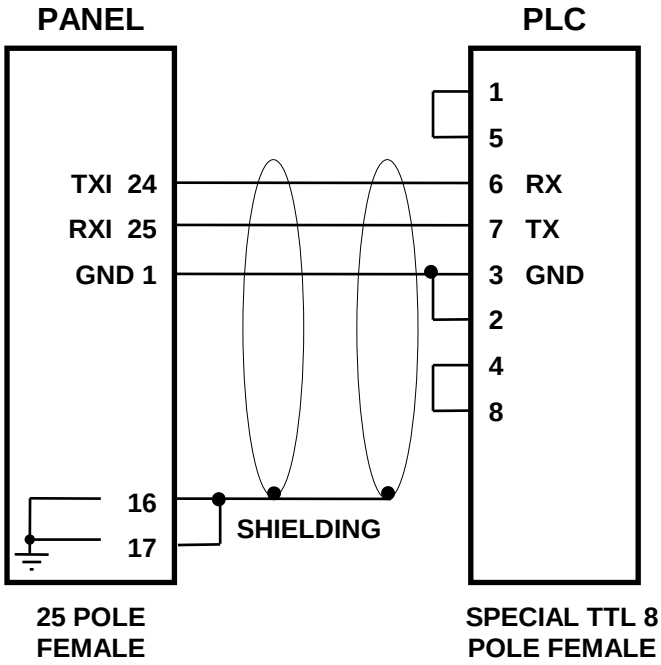
12.2.14. PLC HITACHI EM

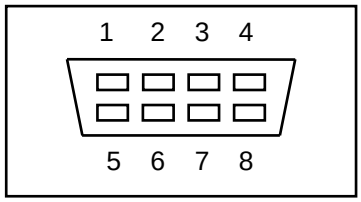






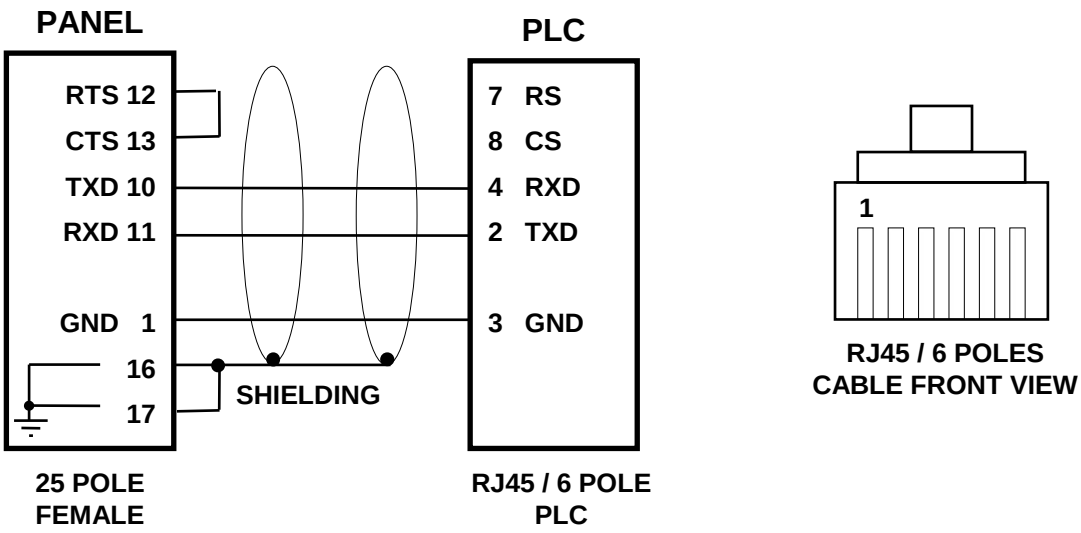
12.2.15. PLC IDEC IZUMI FA-2J / FA-3J



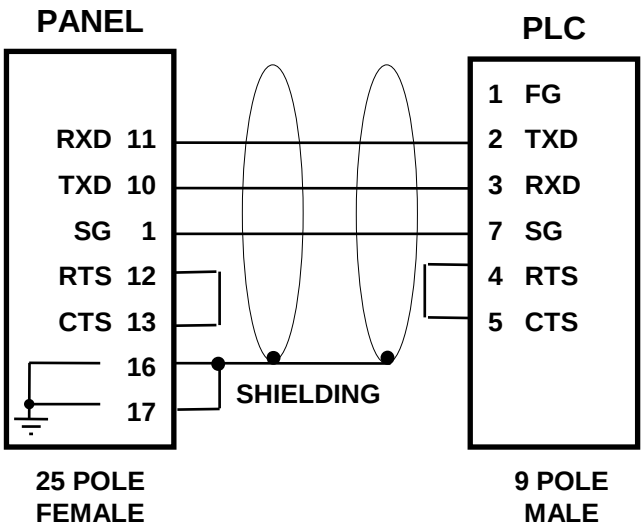


TTL IZUMI
8 POLE CONNECTOR
Front view

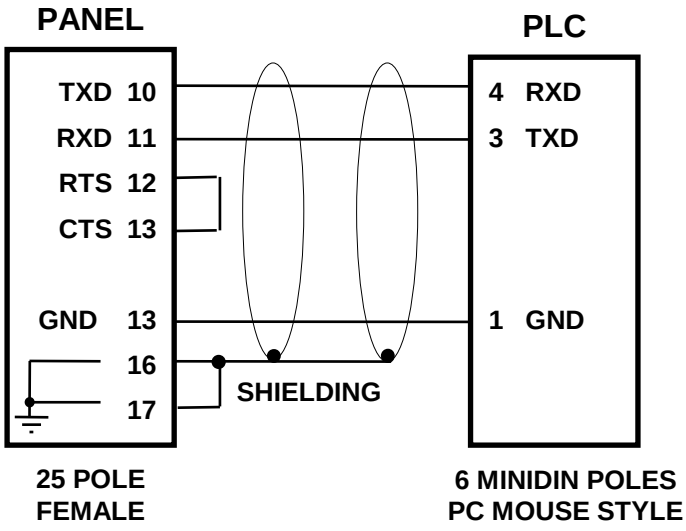
12.2.16. PLC KEYENCE KV



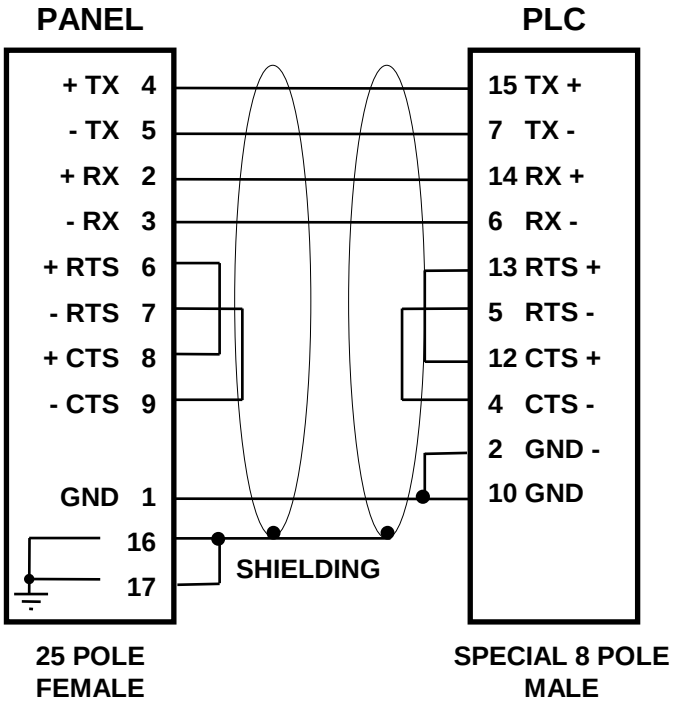
12.2.17. PLC MATSUSHITA FP1-FPM (RS232) C.C.U. FP10SH



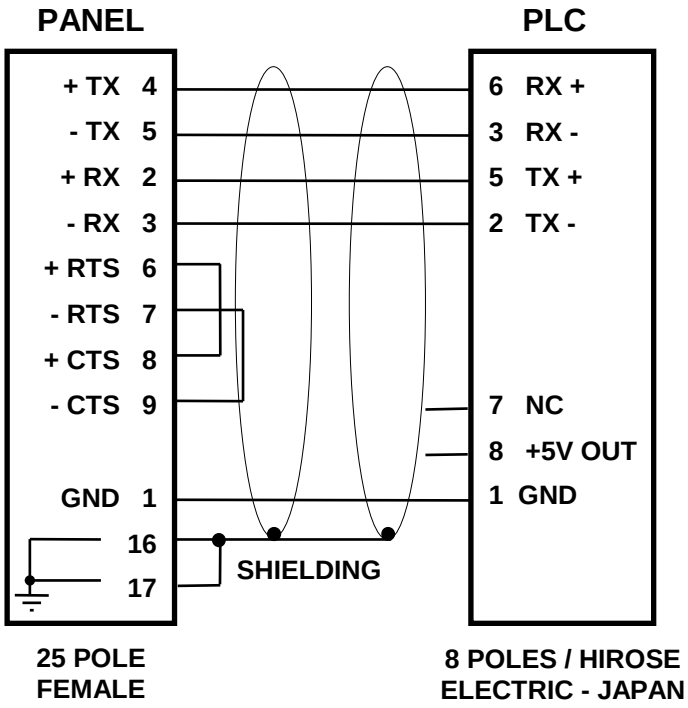
12.2.18. PLC MATSUSHITA FP-M 32TC



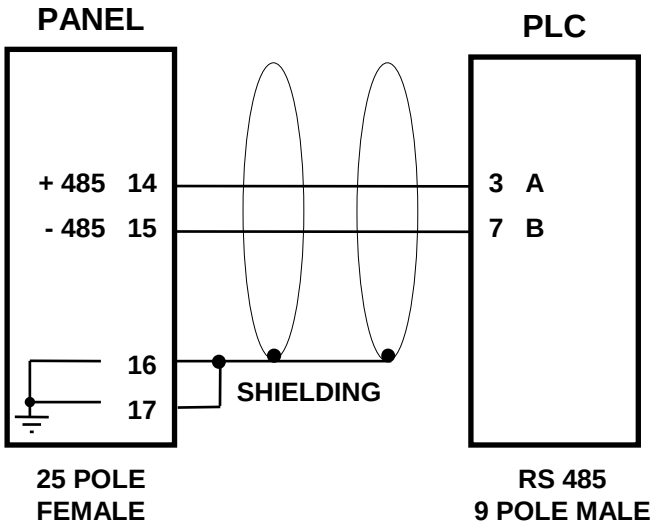
12.2.19. PLC MATSUSHITA FP1-C14 AFP1523 ADAPTOR CABLE



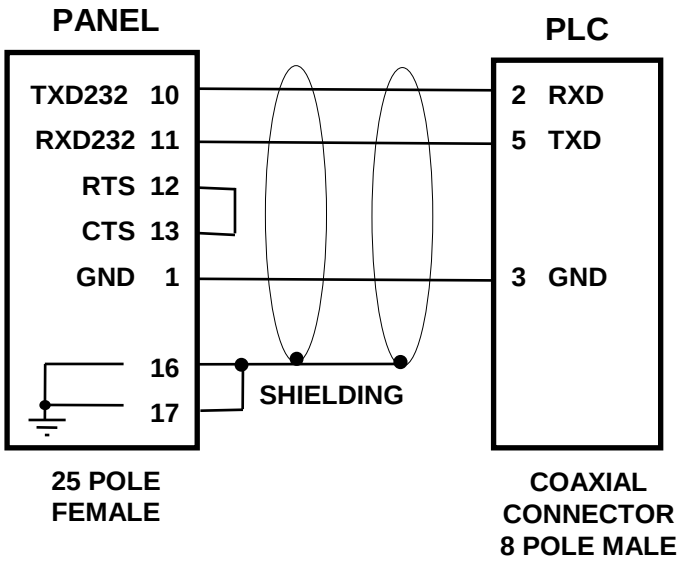
12.2.20. PLC FP1-C14 8 POLE CONNECTOR HIROSE ELECTRIC

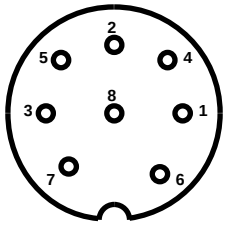


12.2.21. PLC KLOCKNER MOELLER PS306/PS316



12.2.22. PLC KLOCKNER MOELLER KMO - PS4



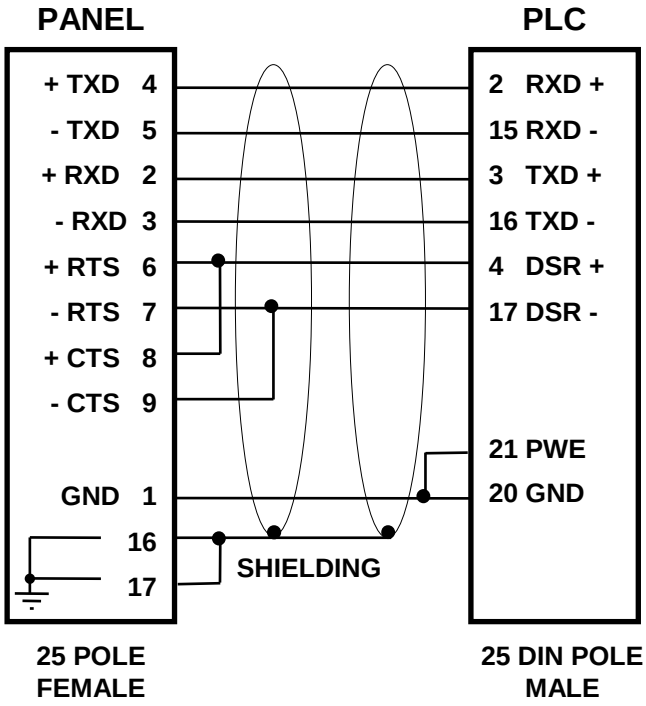


COAXIAL
CONNECTOR
8 POLE MALE

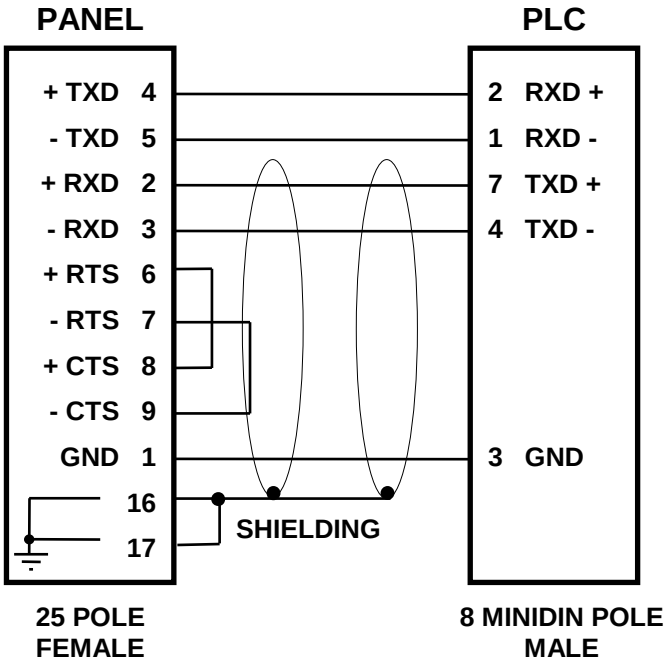
FRONTAL VIEW

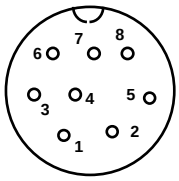
N.B. Control well the position and the number of the pins on the circular connector when the cable is not directly provided by CET.

12.2.23. PLC MITSUBISHI FX AxS



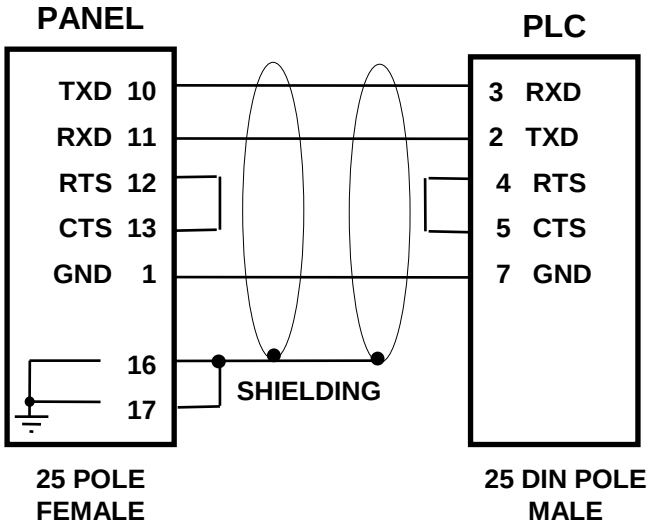
12.2.24. PLC MITSUBISHI FX / FX0-N



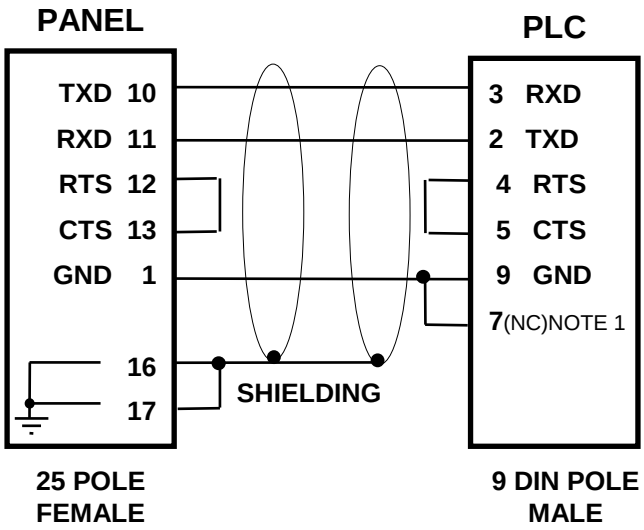


8 MINIDIN POLES
MALE CONNECTOR
FRONT VIEW

12.2.25. PLC OMRON SERIES C200H / C1000H / C2000H WITH LK201



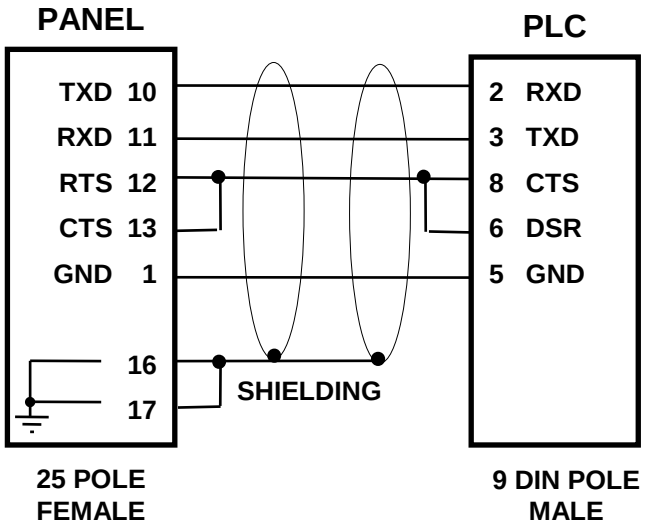
12.2.26. PLC OMRON SERIES C20H / C28H / C40H CQM-1 (CPU 21E)



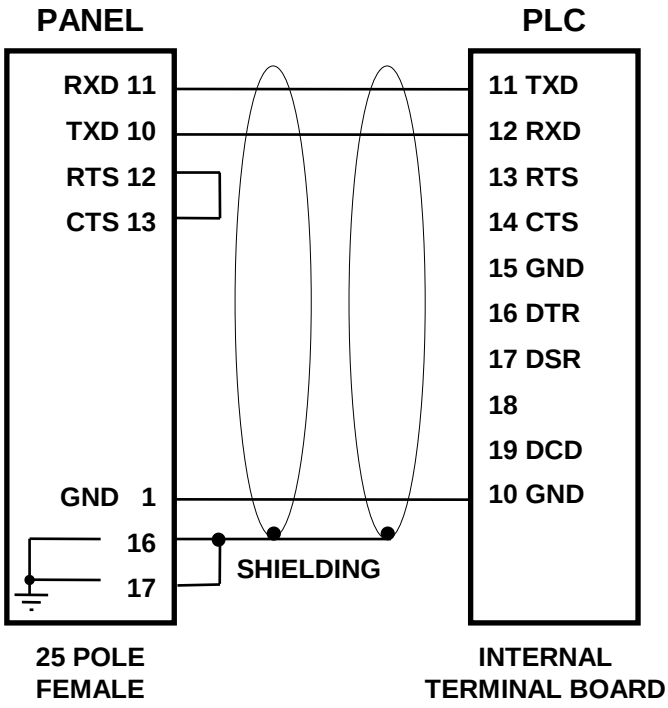
NOTA (1)

The short-circuit connection on pin 9 and 7 of the connector RTS towards the PLC is used to enable the direct use of the cable even on the PLC **Series H** connector**, since pin 7 is not connected with the models of the CQM series.**

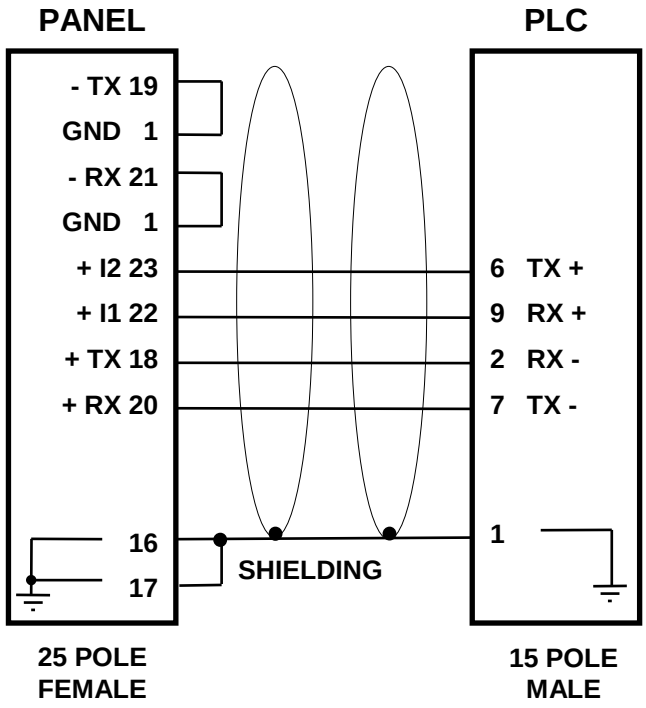
12.2.27. PLC SAIA PCD2 / PCD4 (PGU)



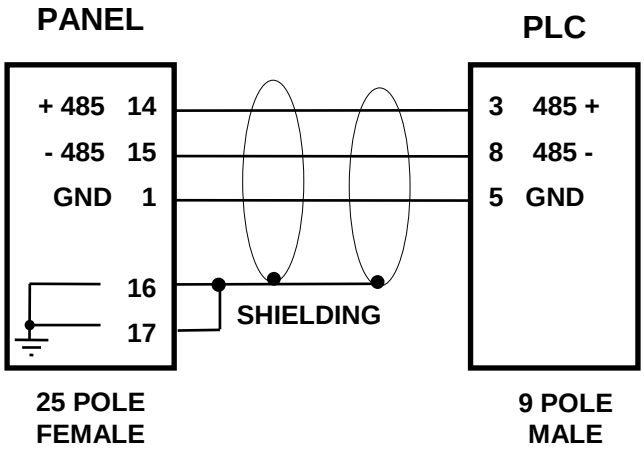
12.2.28. PLC SAIA / INTERFACE RS 232 PCD7.F120



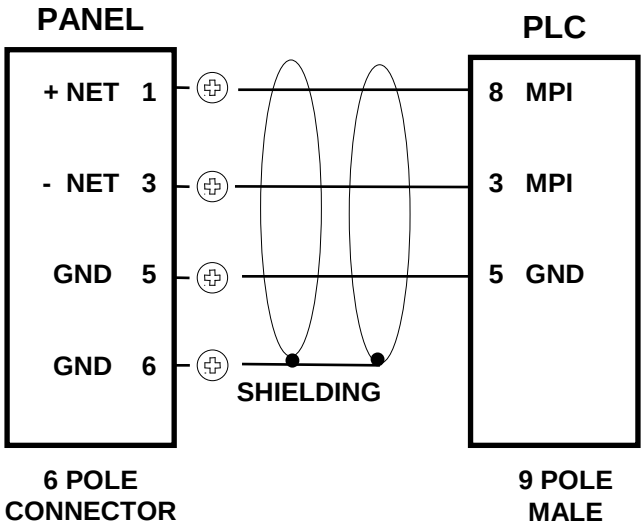
12.2.29. PLC SIEMENS S5 (CPU 95 / 100 / 102 / 103 / 115 / 135)

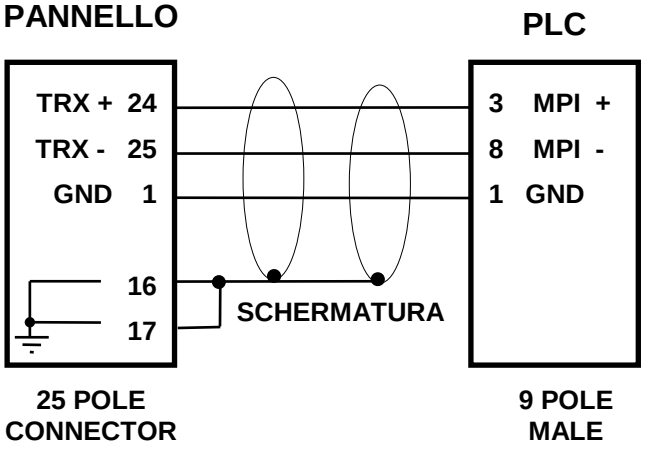


12.2.30. PLC SIEMENS S7 200

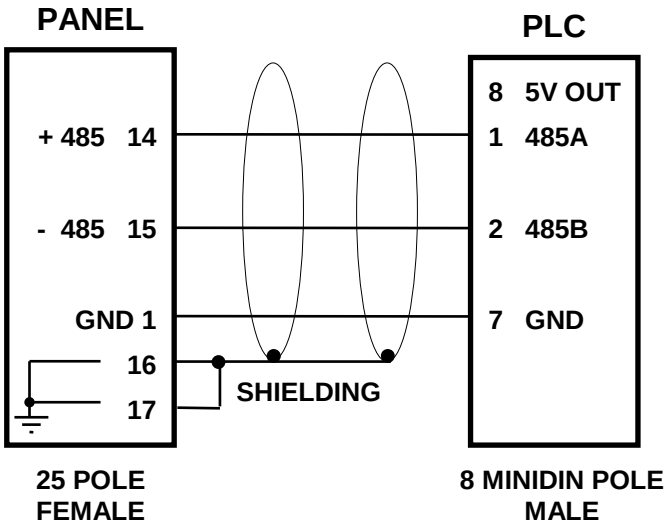


12.2.31. PLC SIEMENS S7 300

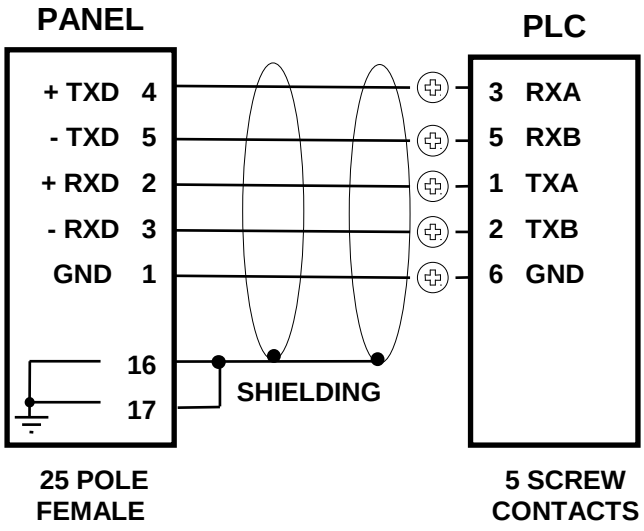


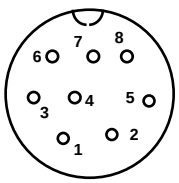


12.2.32. PLC TELEMECANIQUE TSX7 MICRO



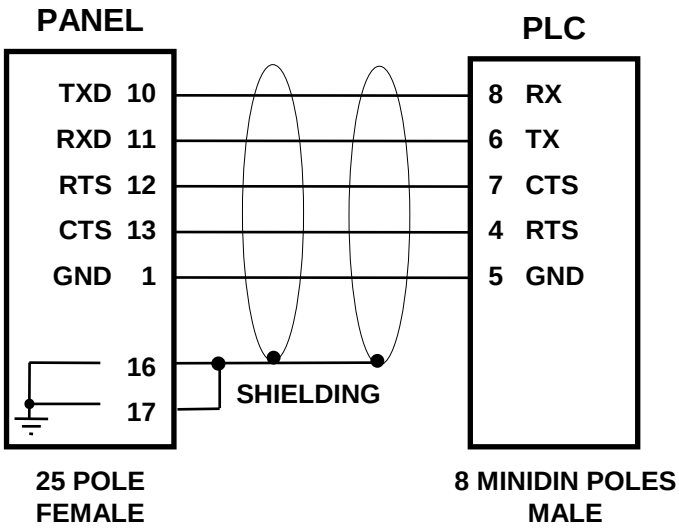
12.2.33. PLC TOSHIBA PROSEC EX MODEL M20 / M40

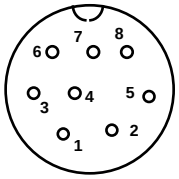




8 MINIDIN POLES
MALE CONNECTOR
FRONT VIEW

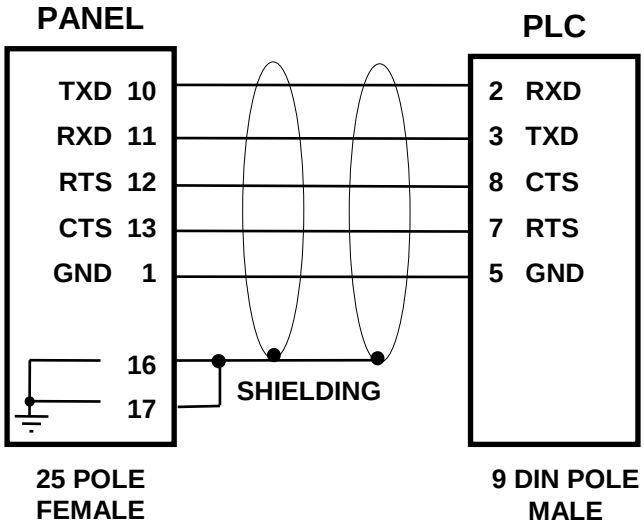
12.2.34. PLC TOSHIBA PROSEC T1



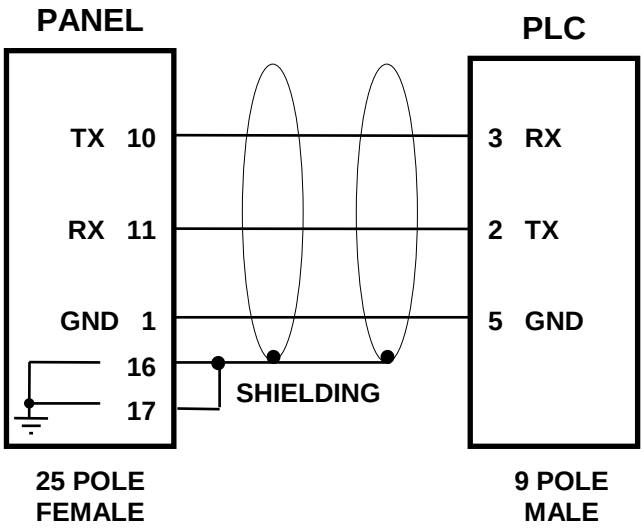


8 MINIDIN POLES
MALE CONNECTOR
FRONT VIEW

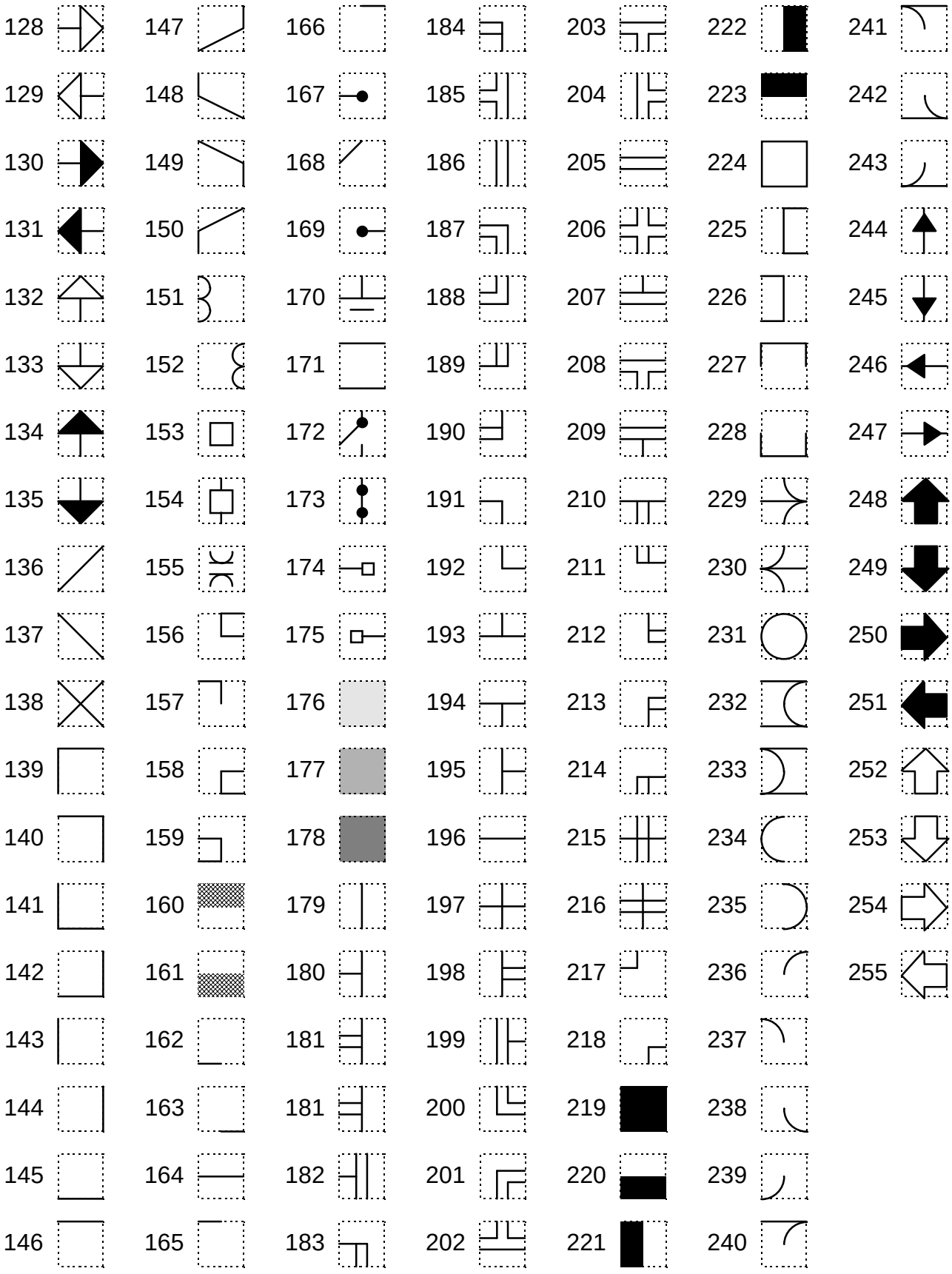
12.2.35. PLC TOSHIBA PROSEC T2



12.2.36. PLC WEG



13. APPENDIX A. TABLE OF THE SEMIGRAPHIC CHARACTERS



14. APPENDIX B. TABLE OF THE LCD FONTS