

GOYA

STD 1

USER'S MANUAL



MANUAL VERSION: 1.05

<i>Refers to software version:</i>	GOYA: 2.68
	CNC / PLC: 3.38

MANUAL CODE :
DATE: 14 MARCH 2000

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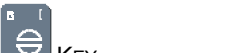




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Contents

GENERAL	7
INTRODUCTION	7
VERSION	7
GENERAL STRUCTURE	8
OPERATOR INTERFACE	8
CNC	8
PLC	8
AUXILIARY PROCESSES	8
INSTALLATION AND CONNECTION	9
UNPACKING	9
POWER WIRING	10
RAM CHECK ERROR	10
CONNECTING THE PC	11
OPERATOR INTERFACE	12
SCREEN, KEYBOARD AND LED'S	12
FRONT PANEL	12
 KEY	13
 KEY	14
 KEY	14
 KEY	14
 KEYS	15
 KEY	15
 KEY	15
 KEY	16
 KEY	16
 KEY	16
 KEY	16
 KEYS	16
 KEYS	16
 KEY	16
 KEY	16
 KEY	17

PASSWORD TO ACCESS PROTECTED FUNCTIONS.....	17
MENU.....	17
MAIN MENU AND MENU LEVELS	17
DISPLAY AND SELECTION OF LINES OF MENU	18
CONFIRMATION OF THE LINE SELECTED	18
ESCAPING FROM A MENU	18
MENU TREE	19
SETTING DATA	20
FIELD OF ENTRY	20
ENTERING DATA	20
CORRECTION.....	20
CONFIRM AND ESCAPE	20
CHECKING THE ENTERED VALUES	20
JOG	21
JOG: 1/3 MOVEMENT OF THE AXES.....	21
MOVEMENT OF THE AXES.....	22
" MACHINE-ORIGIN" SEEKING.....	23
PARAMETER ENTRY	23
JOG: 2/3 DISPLAY THE STATUSES OF THE INPUTS	24
JOG: 3/3 DISPLAY THE STATUSES OF THE OUPUTS	24
PARAMETERS	25
AUTOMATIC	26
AUTOMATIC: SELECT PROGRAM	26
AUTOMATIC: PROGRAM EXECUTION.....	26
START PROGRAM.....	27
STOP PROGRAM.....	27
EXECUTION BY STEP	27
SET EMERGENCY.....	28
ALARM/ERROR HANDLING.....	28
FOV: % SPEED VARIATION.....	29
CHANGE PARAMETERS	29
PROGRAMMING.....	30
SELECT PROGRAM	30
ORGANISATION OF THE MEMORY.....	30
INSERT PROGRAM	31
DELETE A PROGRAM.....	31
DISPLAY / MODIFY A PROGRAM.....	32
MOVE CURSOR	32
INSERT / OVERWRITE A CHARACTER.....	32
DELETING CHARACTERS.....	33
INSERTING A NEW LINE	33
DELETING A LINE	33
STORING A PROGRAM	33
EXIT FROM EDITING	33
TERMINAL.....	34
CONNECTION TO A PC	34
CNC SELECTION	34
OPERATOR PANEL MODE.....	34
AUTOMATIC PROGRAM LAUCH ON START-UP	36
TECHNICAL DATA	36
GOYA CONNECTORS.....	37

GOYA BACK PANEL	38
GOYA POWER SUPPLY.....	39
CONNECTOR: X10	39
CONNECTION TO SERIAL PORT NO.1.....	40
CONNECTOR: X2	40
ENCODER CONNECTIONS.....	41
CONNECTORS: X8, X9	41
DRIVE CONNECTIONS (ANALOGUE).....	42
CONNECTORS: X4, X5	42
DRIVER CONNECTIONS (FREQUENCY).....	43
CONNECTORS: X4, X5	43
DIGITAL INPUT CONNECTIONS.....	44
TERMINAL: X1.....	44
GOYA IMAGE OF INPUTS 31....0	45
GOYA IMAGE OF OUTPUTS 31....0	46
ANALOGUE INPUT CONNECTIONS.....	47
CONNECTOR: X7	47
CANBUS CONNECTION	48
INSTALLATION ADVICE.....	48
APPENDIX 1 - 3 AXES CONTROL	APP.1-1
GOYA CONNECTORS	APP.1-2
DRIVER CONNECTIONS (FREQUENCY).....	APP.1-3
CONNECTORS: X4, X5, X6	APP.1-3
DIGITAL INPUT CONNECTIONS.....	APP.1-4
TERMINAL: X1.....	APP.1-4
GOYA IMAGE OF INPUTS 31....0	APP.1-5
APPENDIX 2 – SERIAL PROTOCOL.....	APP.2-1

GENERAL

INTRODUCTION

This manual contains all the information regarding the technical characteristics and performance of the GOYA CNC. It is intended as a useful guidebook to which the user can refer for a rapid understanding of its functions in order to be able to use them efficiently.

The GOYA CNC is a Numeric Controller, mounted in a DIN container, complete with operator interface [keyboard and LCD graphic display] which can control 1, 2 or 3 axes of the types stepper, d.c. or Brushless, both for point to point positioning and linear and circular interpolation. It can handle machine I/O (16in/8out) either in sequential mode or as a PLC program (optional). The I/O can be expanded up to 128 in + 128 out using Can-Bus.

All the features of the Goya with 3 axes that are different to the controller with 1 or 2 axes will be indicated in the specific section and mentioned in Appendix 1.

Main features:

- LCD graphic screen 128x64 pixel
- Operator and configuration keyboard in polyester
- Power supply: +24Vdc / 10W
- Retention of programs and data even when power is removed
- 1, 2 or 3 axes Stepper, d.c. or Brushless (the third axis is for a stepper motor only)
- PID control algorithm with programmable feedforward action
- Point to point Positioning, linear interpolation, circular interpolation
- Programmable velocity profiles
- Encoder feedback even for stepper motors
- 16 discrete inputs and 8 discrete outputs that can be handled in sequential mode or in PLC logic (optional), expandable to 128 + 128 via industrial Can-Bus.
- Programming Language: ISO (extended) for the axes' control section, AWL (on PC) for the PLC section.
- Fast input for the reading of the axes' co-ordinates (sensor)
- Auxiliary analogue inputs (6 max.)
- Handling of "Variables" from program
- 2 serial lines (one of which can be defined as RS232/422/485) for connecting an "MCP" machine control panel and a remote PC.
- 2 incremental encoders
- Control of parallel processes
- Interface for d.c. or brushless drives: REF. ($\pm 10V$ / 12bit), DIR., ENABLE, FAULT
- Interface for stepper drives: PULSE(100KHZ), DIR., ENABLE, FAULT

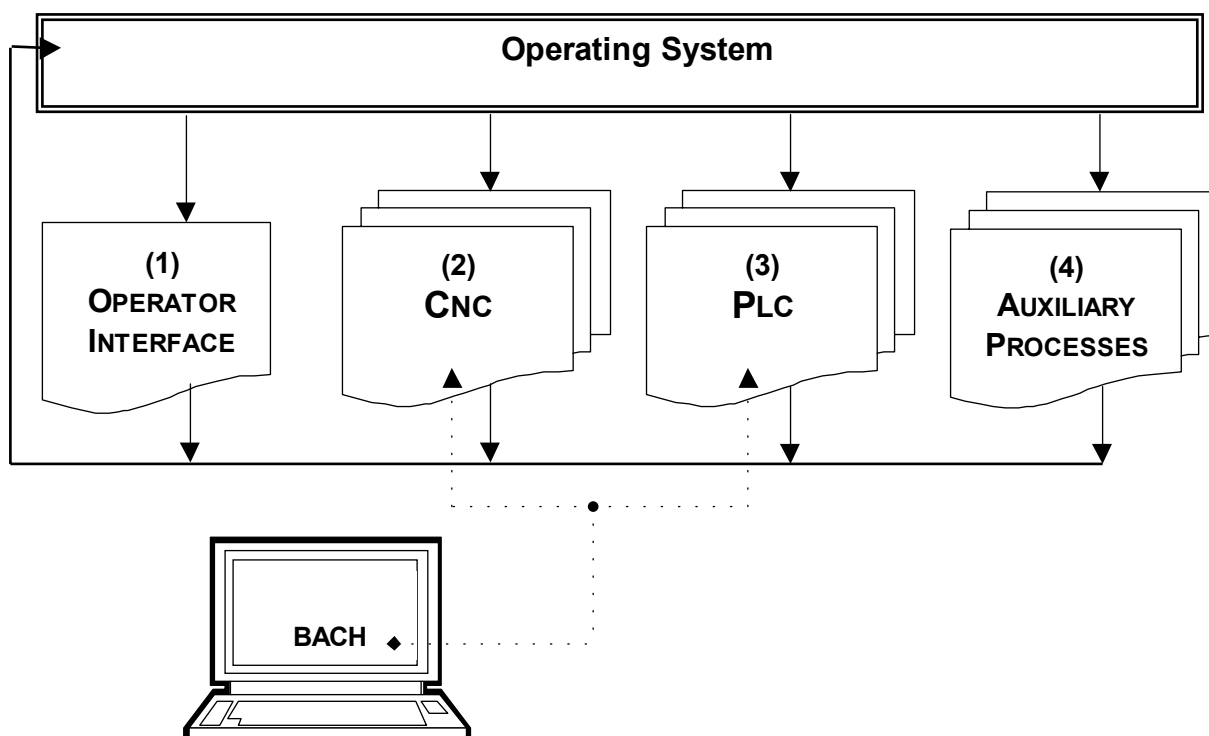
VERSION

The information in this manual refers to the "GOYA Software Version" indicated on cover.

The version of software installed in the GOYA is displayed automatically on the screen each time the equipment is powered up.

GENERAL STRUCTURE

The GOYA has an operating system that can perform several processes in parallel; in particular, the following processes are executed:



OPERATOR INTERFACE

This process handles the operator interface: the screen, keyboard and various operator inputs, etc.

CNC

This process handles the control of the axes

PLC

This process handles the machine I/O (as PLC section)

AUXILIARY PROCESSES

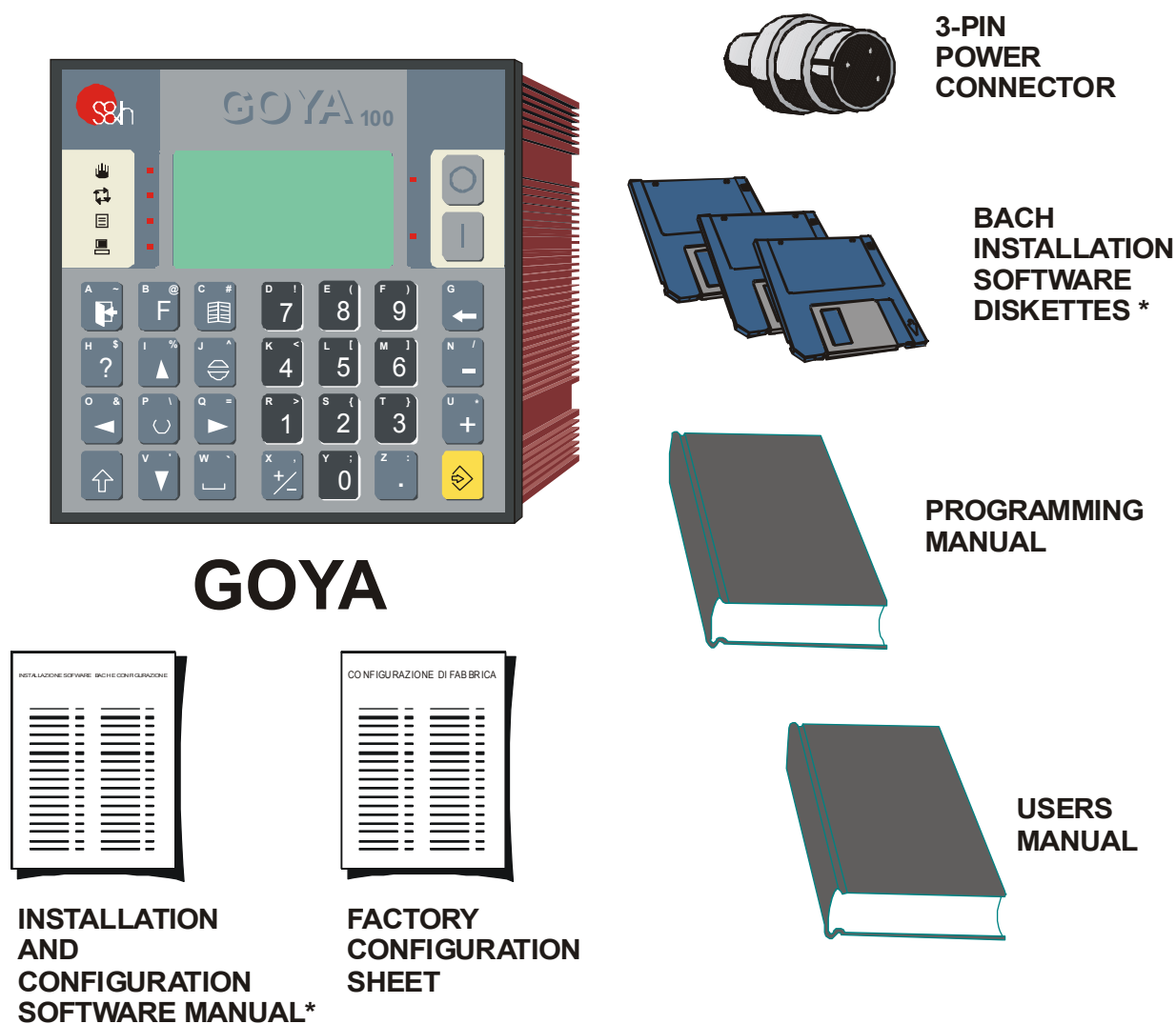
Handles service processes: communications, errors, timing, alarms, watchdog, etc.

Note 1: When the GOYA is connected via a serial link to a Personal Computer, it is possible to handle the processes (2)CNC and (3)PLC directly using the "BACH" support software; this adds the availability of other operational functions such as: uploading/downloading of programs, calibration of the axes' parameters, editing/compiling and debugging of PLC programs, etc.

INSTALLATION AND CONNECTION

UNPACKING

The Goya package contains the following articles:



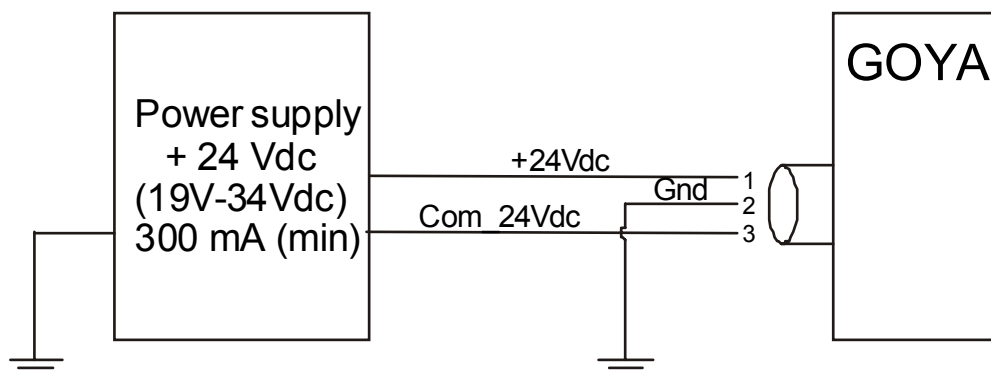
(*) : BACH software is optional

Check that all articles shown in the drawing are present and undamaged. Once the package has been inspected, the main steps to follow are:

- Power wiring
- Connecting the PC

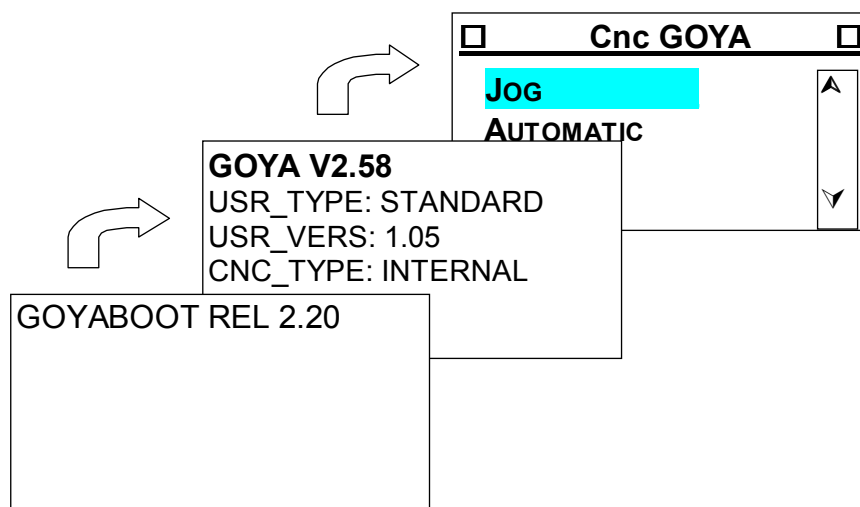
POWER WIRING

Connect the Goya to a 24Vdc (+19VDC ... +35VDC; 320 mA minimum) power supply, using the three pin connector supplied, following the drawing below:



Once connected, the Goya may be powered up;

When switched on, the Goya emits an audible signal and a message appears on the screen to indicate the model and version of software that has been installed in the internal memory. About 3 seconds later, the screen will show the Main Menu page with the two items «jog» e «automatic».




At this point it is already possible to connect the encoders, drives, can-bus etc., following the instructions in this manual.

RAM CHECK ERROR

The display of this error indicates that the GOYA has a problem with the data stored in its memory (the most likely cause is that the internal battery is discharged).

If required, the GOYA can be used temporarily in this condition, provided that all the

lost data is reprogrammed; to proceed, press the “” key. The message will disappear. The error message will go away, leaving the main menu.

CONNECTING THE PC

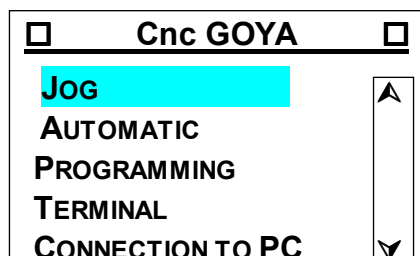
Although the Goya may be used as an independent device, its programming is much easier if there is communication over a serial link. For this reason, if, for example, the Bach program is available, it is recommended that the few operations described on this page are performed and then the Bach programming manual is used. This accesses all the functions of Goya in a much more user-friendly manner. It is however pointed out that the Bach program is only one of the many different ways to supply the Goya with the character sequences that make up its program. The user can therefore develop the program on a custom PC operator interface and then transmit the instructions to the Goya over the serial link. The execution of the instructions does not depend on the activity of the PC. This is only used to transfer the program to be executed, to order its execution and, if required, to delete it from the memory of the Goya.



To communicate from the PC to the Goya, a few steps must be followed:

- Connect the X2 connector of the Goya to the COM1 or COM2 port of the computer, using a serial cable (Standard PC cross-over type)

Operations to be performed on the Goya

- Type the password “74269” to enable the protected functions in the controller. The following screen will appear:



- Select the item “PC connection”, pressing the  key until this line is displayed in reverse and confirm with the  key;

Operations to be performed on the PC

- Install the “BACH” software, following the attached instructions;
- Configure the system, following the same instructions

For greater technical detail, refer to the page entitled “CONNECTION TO SERIAL PORT NO.1” in this manual.

OPERATOR INTERFACE

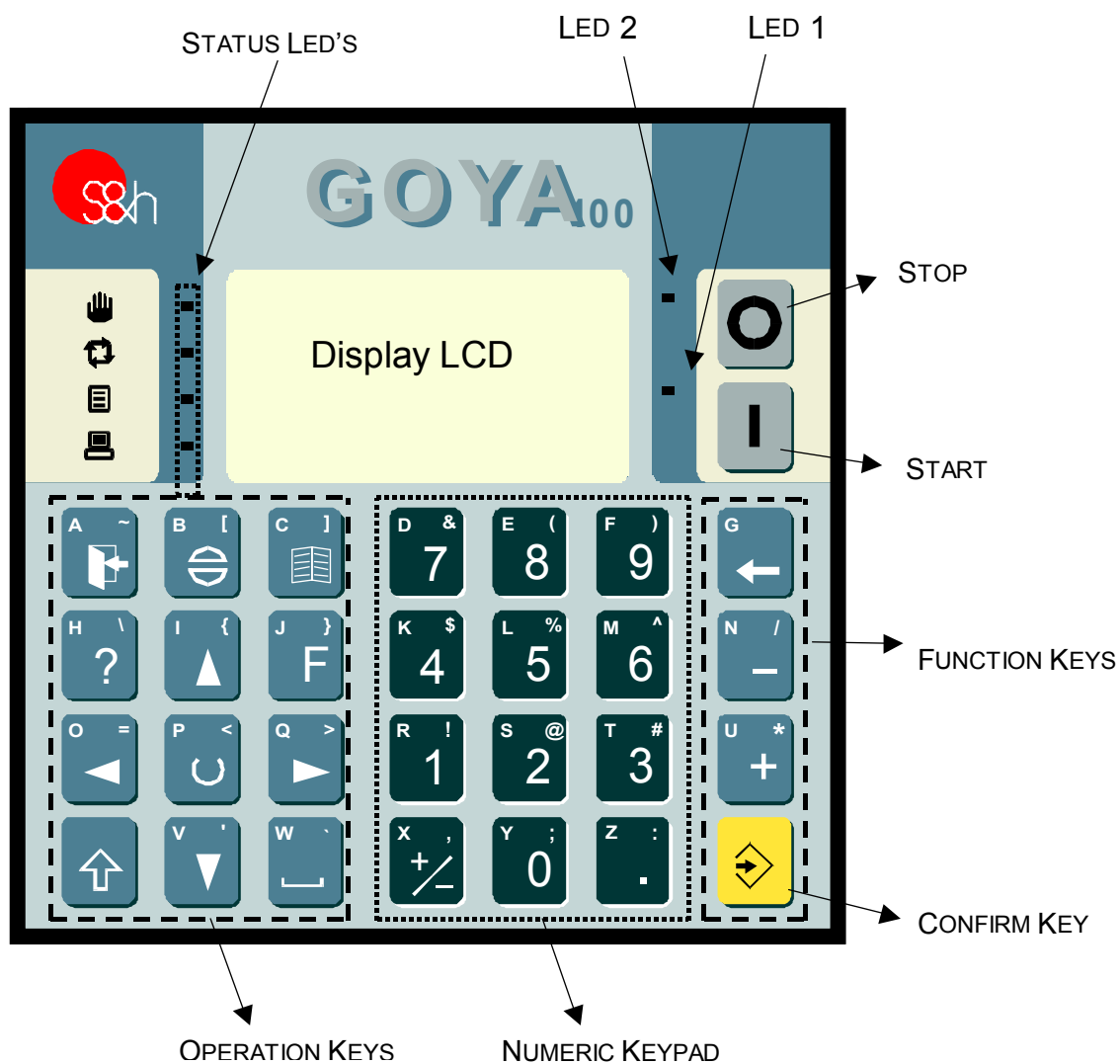
This chapter explains how to access all the functions of the Goya using the local keypad, without using the Bach program or the serial link to a PC. In doing this, wherever possible a path will be followed that, at the same time, illustrates the functions of all the keys that are active at any moment and which will enable the user to perform most of the operations that will normally be needed.

It is recommended that these pages are read at least once, following the operations described on a working Goya that is not attached to the motors.

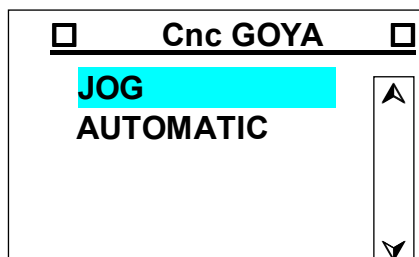
SCREEN, KEYBOARD AND LED'S





The GOYA CNC has an LCD graphic screen (128*64 pixel), a polyester keyboard complete with the operational keys, numeric keys and function keys, 4 LED's for indicating the active operational status as well as another 2 LED's to indicate the active status of the key.

FRONT PANEL



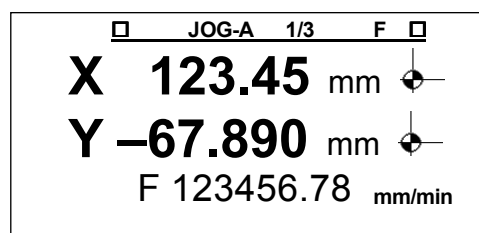
If the power supply has been connected, and the eventual error message **RAM CHECK ERROR** has been cancelled, the screen will show the following image.





In this situation, pressing the  key, it is possible to adjust the contrast of the display. The adjustment is made using the  or  keys until the right contrast is obtained. To exit from this mode, press the  key.

KEY

This key is used to confirm data or instructions entered. If this key is pressed after entering a numerical data value, it confirms the value entered to the controller. Pressing it now confirms the choice of jog operation and the display becomes as shown here:

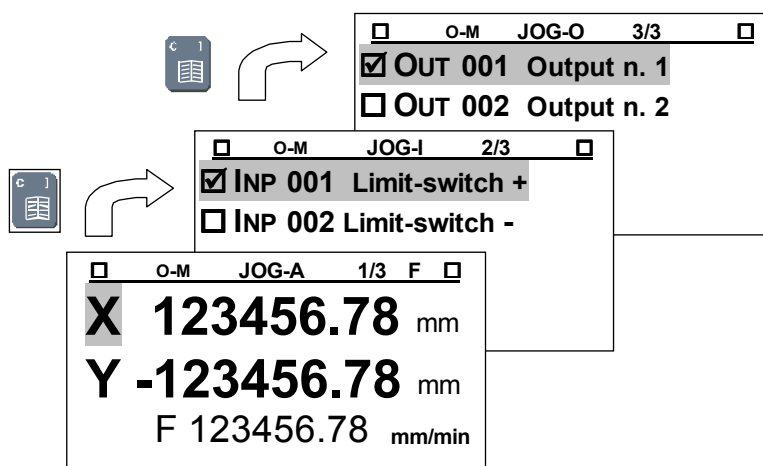


The status line at the top of the screen informs us that the mode of operation is currently "jog displacement of the axes" (JOG – AXES), and the displayed screen is the first of three and that there is a function associated with this screen that can be accessed by pressing the  key (F). The symbol  informs us that the origin of the displayed co-ordinates is the machine origin,




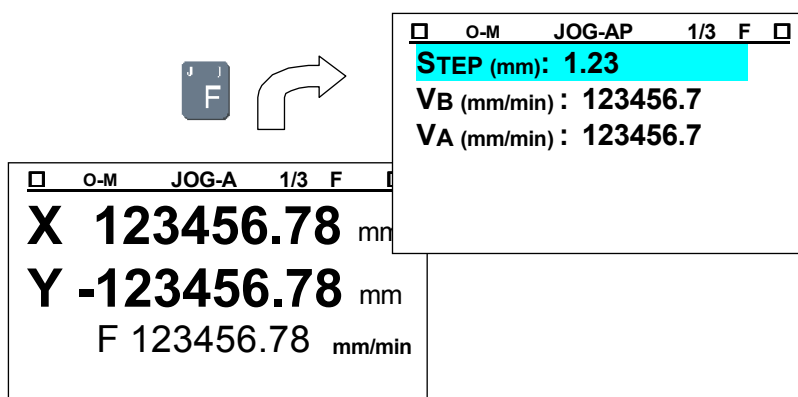
KEY

This key is used to switch, between the various operations, within the active operating mode. For the “Jog” mode, these are “DISPLACEMENT AXES”, “READ INPUTS” and “DISPLAY OUTPUTS”.



KEY



Returning to the “JOG-AXES” screen, pressing the  key, the screen of the jog displacement parameters appears. These are the step, i.e. the unit entity of the displacement obtained when using the + or – keys, and the two speeds at which the displacements will be executed.



KEY


This is the “EXIT” key used to abandon the current operation and return to the operational level or previous menu. The first time it is pressed, the “JOG-AXES” screen will re-appear. The second time will bring up the general menu screen.

**KEYS**



Arrow keys: move the cursor and/or select lines of menu, according to the mode. These key take on particular meanings in specific modes: for example, in “JOG-AXES”, the  key is used to make a continuous movement along the selected axis in the positive direction of the co-ordinates and the  key is used to move the same axis in the negative direction.








**KEY**

This key is used to make direct entry of numerical data. For example, in “JOG-AXES”, if this key is pressed, it is possible to enter the co-ordinate to which the axis must move.

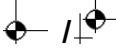
When confirmed with the  key, the Goya move the chosen axis to the specified co-ordinate.

**KEY**

This is used to select one of the characters present on each key. For example, the  key contains the characters “O”, “Y” and “;”. When there are more than one character on a key, the  key is used to select the one to use. On power up, the LED's are off and the large character at the centre of the key is active.

- The first time the  key is pressed, the character at the upper left of the key is activated and **LED 1** turns on. Therefore, when the  key is pressed, the screen will show the character “Y”.
- The second time the  key is pressed, the character on the upper right of the key becomes active and **LED 2** turns on and **LED 1** goes out. So when the  key is pressed, the character “;” appears.
- The third time the  is pressed, the large character in the centre of the key becomes active again and both the **LED's 1** e **2** turn off. So when the  key is pressed, the character “O” appears.
- If the  key is held down at the same time as another key, the character that is activated is the one at the top left of the key (**LED 1**), but this character does not remain stable and selected.

**KEY**

If pressed while in the “write text” mode, it is the “space” character. Otherwise it is used as a key for switching between immediate parameters. For example, in “JOG-AXES”, it toggles the origin of the co-ordinates of the axes: , respectively the 0 at the machine origin and the 0 for a local origin.

**KEY**

If pressed in the “DATA ENTRY” mode, it is used to change the sign of the data (setting negative values), otherwise it is used to switch between immediate parameters. For example, in “JOG-AXES”, it switches between the “SLOW” and “FAST” movement of the axes.

**KEY**

This is the “DELETE” key for deleting the previous character entered in the write program or data entry operations, otherwise it is used as a key to delete or cancel inside a specific operation.

**KEY**

This is the “SET” / “RESET” key used to enable/disable the emergency or alarm conditions.

**KEYS**

These are the numeric keys that are used to enter numerical values, for example, the co-ordinates of axes or number of the program to be selected.

**KEYS**

The “+” and “-” keys associated with the numeric keypad are used to add the entered value to or subtract it from the current value (just like a normal calculator). They can also be used for special meanings in specific modes: for example, in “JOG-AXES”, they are used to execute the displacement of one step towards the positive and towards the negative co-ordinate direction respectively.

**KEY**

Decimal point: used during the entry of numerical values, to enter the decimal part of the data.

**KEY**

The “STOP” key stops the execution of the current program while in “AUTOMATIC” mode.

While writing a series of characters, it disables the INSERTION mode.

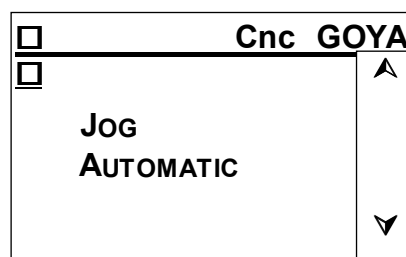


KEY

The “START” key runs the selected program within “AUTOMATIC” mode. In other modes, it has different functions. For example, while writing a series of characters it enables the INSERTION mode.

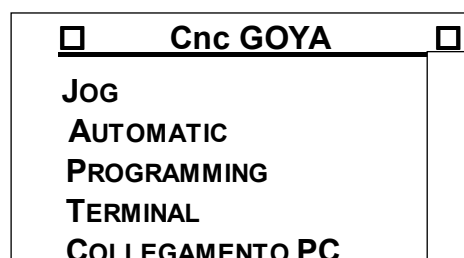
PASSWORD TO ACCESS PROTECTED FUNCTIONS

The normal display of the main menu is the following:



This allows only jog displacement of the axes, machine zero seeking and the selection of a previously written program.

All the other mode functions are protected. It is possible to access these by typing the password “74269”. After doing this, the main menu looks like this:



Typing in the same password again restores the normal display.

Once the general meaning of all keys and the principles of the display are clear, we are ready to expand our knowledge of the Goya and start making it perform its CNC functions. With this intention, the equipment must first have the parameters regarding the mechanical and electrical characteristics of the moving parts loaded into its memory. If this configuration has not been performed in the factory, refer to the relative appendix, which describes the methods for calculating the parameters to be entered.

MENU

The structure of the “OPERATOR INTERFACE” section of the GOYA is based essentially on the display of menus, or lists of possible operations, that allow the operator to identify and select the actions to perform from time to time.

MAIN MENU AND MENU LEVELS



On power up, after the initialisation screens, the GOYA shows the main menu that is a list of the main operations that can be performed with the GOYA itself.

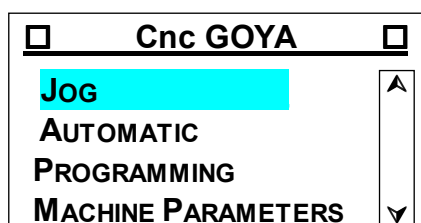
The selection of one of these functions can bring up the display of another menu: this will go on until the action to perform has been defined completely. In other words,

different levels of menu are structured, so that starting from the main menu, and entering into different levels of submenus, the action required will be arrived at see also: MENU TREE)


DISPLAY AND SELECTION OF LINES OF MENU

During the display of a menu, the line selected is displayed in “REVERSE” colours, i.e. white letters on a black background. There is also a scroll bar on the right of the screen (last column) that also indicates the displayed lines of the menu.


The  and  keys are used to select the next or previous line to one currently displayed as being selected. These keys will also cause an update of the screen that will scroll the page up or down.



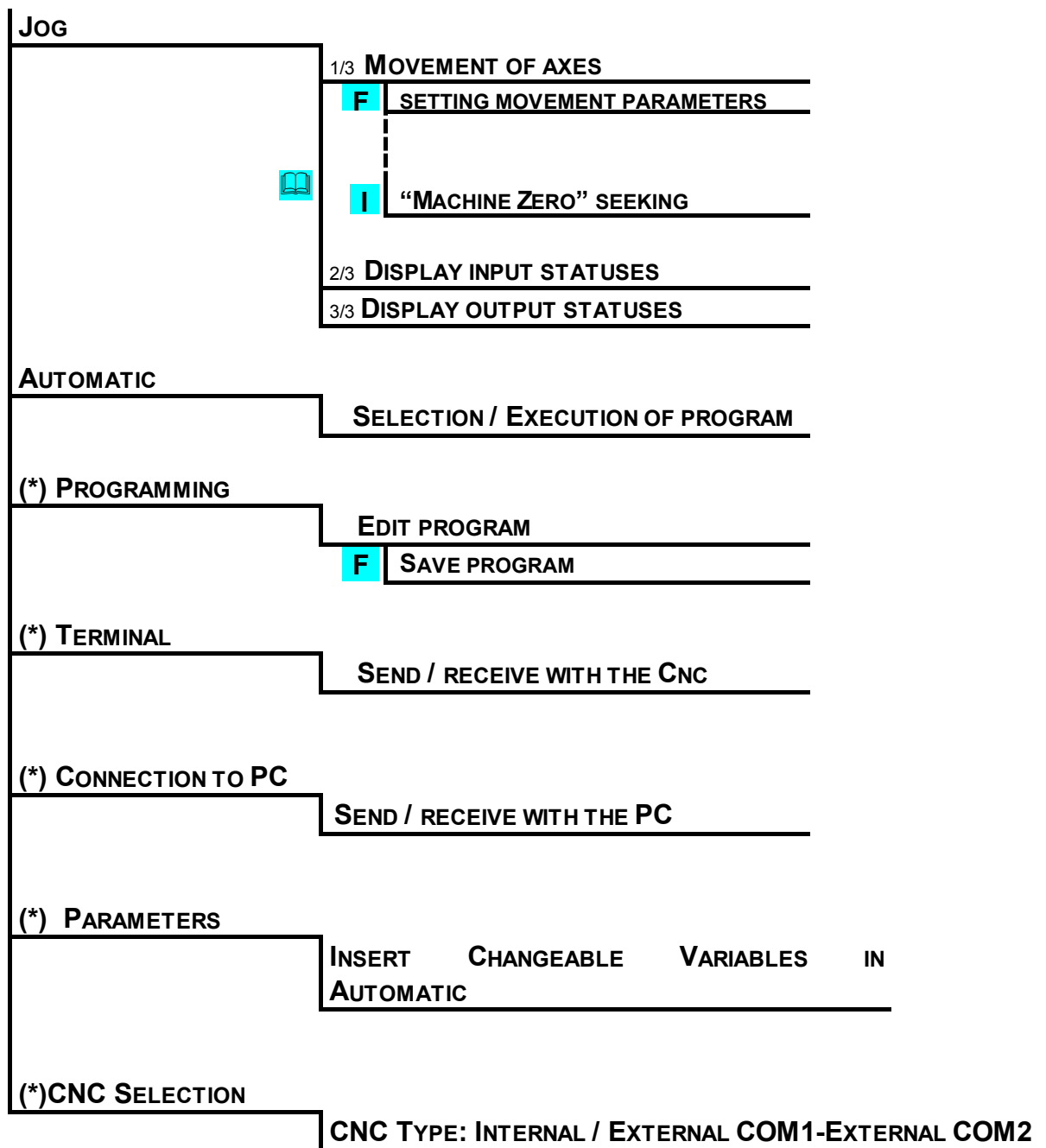
CONFIRMATION OF THE LINE SELECTED

Once the required line has been selected, the choice is confirmed by pressing  key that will cause the execution of the corresponding task.

ESCAPING FROM A MENU

Apart from when in the MAIN MENU, it is possible to escape from any submenu and return to the previous level of menu by pressing the  key. This is independent of the line selected at the time.

MENU TREE



- (*) = Operational mode accessible with password.

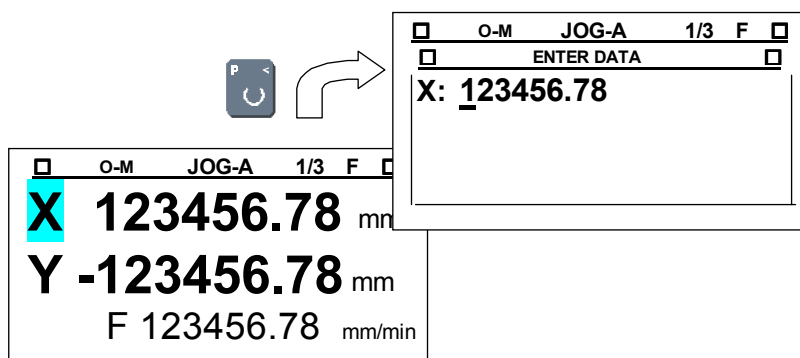
SETTING DATA

During the execution of some operations, the operator is asked to enter numerical values. These can be integers or real numbers, with or without sign, as a function of the type of data that must be set for this particular operation, for example, co-ordinate, velocity, program number, etc.

FIELD OF ENTRY

When a numerical data entry is requested, an entry field will appear on the screen showing the current value of the data and another for entering the new value. The dimensions of this field, and the position of this field, will change according to the function of the data that must be entered.

Example:



ENTERING DATA

Data is entered using the numeric keys ..., the decimal point key , and, if required, the , , or key to define the sign of the number (positive or negative). Only the keys that are required for entering that particular data type are accepted for this operation.

CORRECTION

At any time before the data is confirmed, the entry can be corrected using the key.

When the key is pressed, the cursor moves one place to the left, cancelling the last character entered.

CONFIRM AND ESCAPE

Once the required value has been entered, it must be confirmed using key. The is used to exit from the DATA ENTRY mode without entering new data.

CHECKING THE ENTERED VALUES

The Goya performs certain checks on the entered data and if it is incorrect or falls outside the predetermined limits, the anomaly is indicated and the data entry is not accepted.

JOG

The jog mode allows the following functions:

- 1/3 *MOVEMENT OF THE AXES*
 - *SET MOVEMENT PARAMETERS*
 - *MACHINE ORIGIN SEEKING*
- 2/3 *DISPLAY OF THE STATUSES OF THE INPUTS*
- 3/3 *DISPLAY OF THE STATUSES OF THE OUTPUTS*

The presence of the different mode of “JOG” is indicated on the status line at the top of the screen where the number of the active mode and the total number of functions is displayed: “1/3”.

Furthermore, the status line at the top of the screen shows the symbol “F” whenever there is an associated submenu.




The  key is used to switch between the various available functions:

- 1/3 *MOVEMENT OF THE AXES*
- 2/3 *DISPLAY OF THE STATE OF THE INPUTS*
- 3/3 *DISPLAY OF THE STATE OF THE OUTPUTS*



When in the screen for “*MOVEMENT OF THE AXES*” It is possible to switch to the function

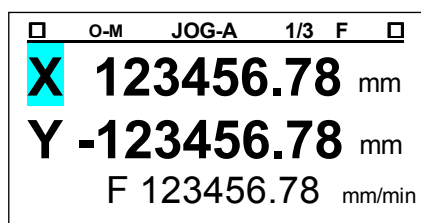
“PARAMETERS” using the  key”:




- 1/3 *MOVEMENT OF THE AXES*
 - *PARAMETERS: MOVEMENT*


When in the “MOVEMENT OF THE AXES” screen, the start  key can be used to activate the “SEARCH FOR MACHINE ORIGIN” function.

JOG: 1/3 *MOVEMENT OF THE AXES*



In this mode, the axes can be moved manually. The operator can select the required axis with the  and  keys. The selected axis is clearly identified on the screen in “REVERSE”.





The display of the co-ordinates can be switched between “ABSOLUTE” and “INCREMENTAL” immediately using the  key or in the “PARAMETERS” menu. The indication of the origin selected and therefore the type of display that is active is shown to the right of the co-ordinate, where the  symbol appears if it is absolute and the  symbol appears if it is in incremental.


Pressing the  key, it is also possible to define the current position of the selected axis as the absolute origin of the co-ordinates. In this way, it is possible to refer all movements to an arbitrary position chosen by the user. Goya does however request confirmation before executing the instruction.


MOVEMENT OF THE AXES

The axis selected can be moved “*in continuous mode*”, forward or reverse respectively, using the  or  keys and holding them down. When the key is released, the movement of the axis will stop.

The selected axis can be moved just one “STEP”, forward or reverse respectively, pressing the  or  key.



During the movement, the co-ordinate of the axis is continuously updated on the screen.

Use the  key to switch the displacement velocity of the axes immediately between “HIGH” and “LOW”. The velocity is displayed at the bottom of the screen.




Pressing the  key, it is possible to set the “PARAMETERS” of the “JOG” mode, i.e. the dimensions of the “STEP”, the “SLOW SPEED” and the “FAST SPEED”



The selected axis can be moved to a defined co-ordinate using the direct entry of the co-ordinate to which it is required to move the axis. There are two different cases:

1) Displacement to the co-ordinate entered


Press the  key to enter into the “DATA ENTRY” mode, enter the required co-ordinate for the selected axis, press the  key to confirm the data and move the axis to the entered co-ordinate.

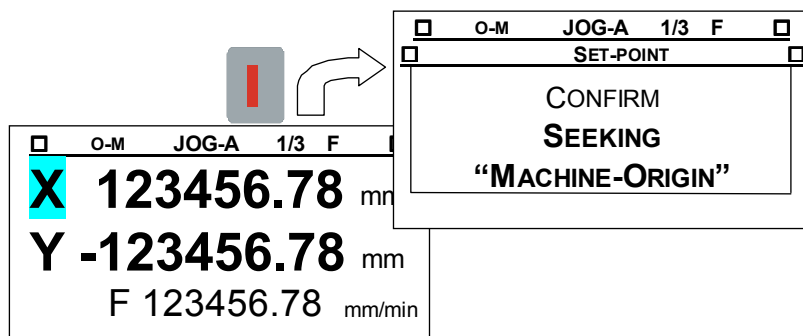
2) Relative displacement to an entered co-ordinate


Press the  key to enter into the “DATA ENTRY” mode, enter the required co-ordinate for the selected axis, press the  or  key to confirm the data. The value entered will be added or subtracted from the current co-ordinate and the axis will move to the resultant position.

N.B. Both the absolute and relative displacement values entered are referred to the selected origin:  Machine Origin or  Local Origin.

“MACHINE-ORIGIN” SEEKING

In the “JOG, ...MOVEMENT OF THE AXES” mode, the “MACHINE ZERO SEEKING” function can be performed. To activate this procedure, press the start key . The screen will show the screen that will request confirmation for the activation of the procedure.




Press the  key to activate the “SET POINT” procedure. The axes will move in the predetermined direction until they activate the respective microswitches that indicate the zero position.

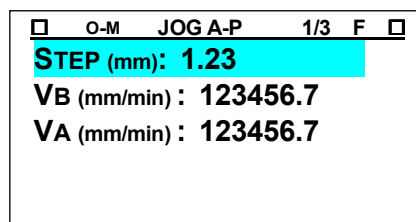
N.B. The procedure to seek the machine origin runs the CNC program No.116. This program is not visible on the menu, like all those above number 99, but it can still be accessed using the procedure for “DATA SETTING PROGRAMMING”




To interrupt the “SET POINT” procedure, press the STOP key .

PARAMETER ENTRY

The “PARAMETERS” mode is accessed by pressing the  key. In this mode the following parameters can be changed:

- PARAMETERS: MOVEMENT
 - “STEP”
 - Velocity “SLOW”
 - Velocity “FAST”



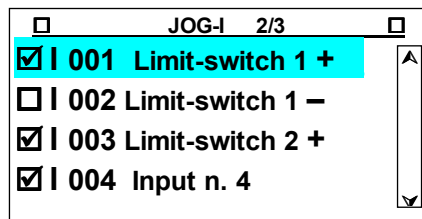
Use the  and  keys to select the parameter to be modified. Enter the new value and confirm it with the  key before exiting from the page.



N.B. The step data must be within the range between the “minimum” and “maximum” values defined for the AXES PARAMETERS (refer to the programming manual).

JOG: 2/3 DISPLAY THE STATUSES OF THE INPUTS

In this mode, the statuses of the digital inputs to the GOYA can be displayed. The screen will show a list of the inputs where each line will show a letter "I" (meaning Input), the number of the input, and the description of the input when this has been defined.

The status of the input is seen as "ACTIVE"() or "DISACTIVE"() , displayed on the left of the line.

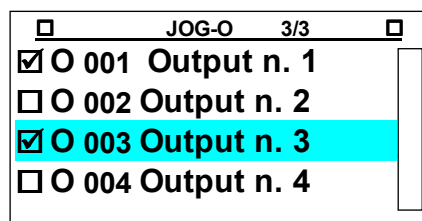




Use the  and  keys to position the cursor on the input to be displayed: the input selected is seen in "REVERSE" colour.

JOG: 3/3 DISPLAY THE STATUSES OF THE OUPUTS

In this mode, the statuses of the digital outputs of the GOYA can be displayed. The screen will show a list of the outputs where each line will show a letter "O" (meaning Output), the number of the output, and the description of the output.

The status of the output is seen as "ACTIVE"() or "DISACTIVE"() , displayed on the left of the line.







Use the  and  keys to position the cursor on the output to be displayed: the output selected is seen in "REVERSE" colour.

PARAMETERS

In this operational mode, it is possible to associate twenty variables used in the program to twenty memory locations in the Goya operator interface. In particular, it is possible to specify the number indicative of the variables (Q), the description or physical significance (TAG), the limit values that they can assume (MIN and MAX), the number of decimals with which the numerical values will be expressed (DEC). The Goya makes 20 locations available, but the number indicated is arbitrary. Therefore there is nothing to stop associating variable Q103 to location 1. In the status line, at the top, the sequential number of the location that is being operated is displayed.

□	<u>LOCATION 1</u>
	□
Q:	0
MIN:	0.
MAX:	0.
DEC:	0
TAG:	

In the "AUTOMATIC" operational mode, during the running of a program, it will be possible to assign the current value to the locations defined here and this value will then be assigned to the associated CNC variable.





Use the , ,  and  keys to position the cursor on the field whose contents are to be modified. For example, the location 1 could be defined as follows:

□	<u>LOCATION 1</u>
	□
Q:	103
MIN:	0.
MAX:	2000.
DEC:	0
TAG:	No. CYCLES

And now in the program, the variable will be referred to as Q103, it shall be an integer that can assume any value between 0 and 2000 and when its value is assigned in Automatic, it will be indicated by the description "NO. CYCLES". In assigning the indicative number of the variable, remember that:

- variables from Q1 o Q100 are volatile (their value is not remembered if power is removed)
- variables Q96, Q97, Q98, Q99 and Q100 are reserved by the controller for its own functions, among these, the only ones that are of interest to the user are Q98 = entity of a step in jog and Q99 = current velocity in jog displacement.
- variables from Q101 to Q200 are non-volatile.

The field Q can assume all values between 1 and 199. The fields MIN and MAX are limited to 9 characters, including the decimal point, but excluding an eventual minus sign. If both these fields are set to 0, the variable can assume any value. The DEC field can assume the values 0, 1, 2 and 3. The TAG field is limited to 10 characters.

To display the locations associated, use the  and  keys. Press the  key to associate a new location. To annul an existing association, press the  key while it is displayed.

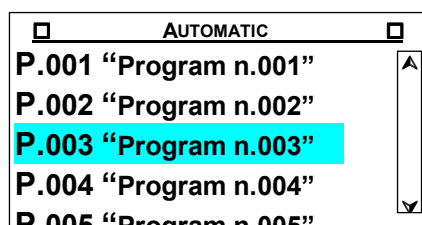
AUTOMATIC



The “Automatic” mode is that which allows one of the programs present in the equipment’s memory to be selected and run.



AUTOMATIC: SELECT PROGRAM

When the “AUTOMATIC” mode is entered, the screen displays the programs that are present in the GOYA.

Each line carries the letter “P” (for program), the No. of the program, the name of the program.



Use the  and  keys to position the cursor on the program to be displayed: the program selected is seen in “REVERSE” colour.

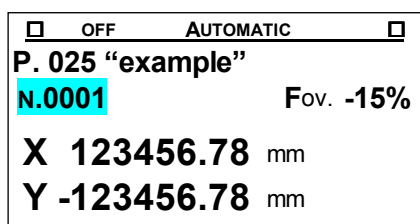
Alternatively, to go directly to the required program, press the  to enter the “DATA ENTRY” mode and enter the number of the required program (1...100) and press the  key to confirm the selection.

Once the program has been selected, press the  key to move to the “PROGRAM EXECUTION” mode.

AUTOMATIC: PROGRAM EXECUTION


In this mode, the screen will show:

- The number of the program (P.025) and its name (“example”) on the first row at the top after the “status line”.
- The number of the line currently being executed and the information regarding the variation in % of the work speed, “F override”, on the second row at the top after the “status line”.
- The co-ordinates of the axes are displayed on the rest of the screen







The number of the line currently being executed, the co-ordinates of the axes and the "F override" data are continually updated, even during the execution of the program.


START PROGRAM





When the  or START key is pressed, the program selected begins to run. While the program is running, the screen will be continually updated with the number of the line being executed, the value for the percentage variation of the speed (Fov) and the values of the co-ordinates of the axes.

The functions available during the running of a program are:



- 1) **STOP:** interrupt the running of the program. This is performed by pressing the  key. If a START ( key) command is made, the program will restart at the point at which it was interrupted.
- 2) **SET EMERGENCY:** the emergency condition can be activated using the  key
- 3) **EXIT FROM AUTOMATIC:** abandon the automatic mode. This is performed by pressing the  key. Once the automatic mode is exited, any program that is running will be interrupted (STOP) and cancelled ("←").



STOP PROGRAM

Pressing the STOP  key while a program is running will interrupt the program. In this condition, the functions available are the following:


- 1) **START:** the  key, recommences the program from the point at which it was interrupted with the STOP command
- 2) **CANCEL THE RUNNING OF THE PROGRAM:** the  key cancels the execution of the active program. Any subsequent START ( key) command will make the program start from the beginning.
- 3) **EXIT FROM THE AUTOMATIC MODE:** abandon the automatic mode. This is performed by pressing the  key.

EXECUTION BY STEP

This mode of operation enables the program to be executed step by step, which means one line at a time. The execution of each step is obtained using the  key. It is possible to return to the continuous running of the program, starting from the line at which it has arrived, by pressing the  or START key.

N.B. If the execution of the program has been interrupted with the  key and the  is pressed, Goya executes all the instructions accumulated in the receiving buffer of the CNC. Only after this buffer has been emptied it goes into the step-by-step execution mode.

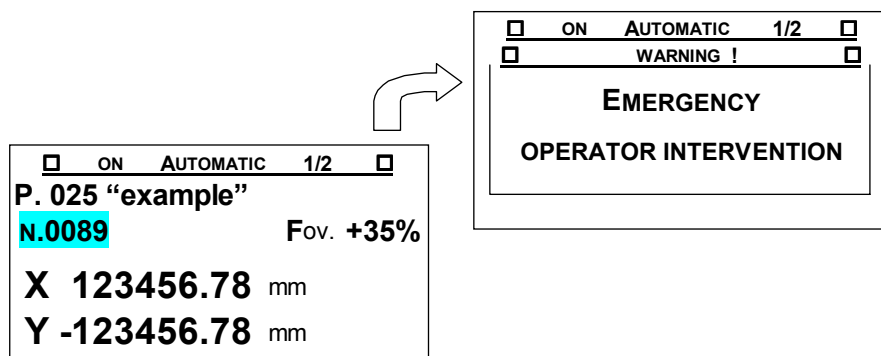
SET EMERGENCY

If the  key is pressed at any point, the emergency condition is established (on the operator's request) and the screen will show the text "WARNING !" with an indication regarding the condition that has generated the emergency.



The functions available in this condition are those referred to in the "ALARM/ERROR HANDLING" mode.

ALARM/ERROR HANDLING

During the running of the program, the presence of alarms or errors is continually checked. Should an alarm be detected, the program that is running will be temporarily suspended the screen will show the text "WARNING !" with an indication regarding the condition that has generated the emergency.




When the system is in the "WARNING !" mode, the available functions are:


- 1) **SILENCE EMERGENCY:** the  key silences the active state of emergency. The "WARNING !" screen disappears. At this point the state of emergency is removed and it is possible to proceed with "RUN PROGRAM" mode, that nevertheless re-starts from the beginning.
- 2) **SILENCE EMERGENCY:** pressing first the  key, all the operational modes can be accessed. As the emergency condition has not been annulled, it will not be possible to move the axes and the "CNC ALARM" screen is shown returning to the modes "JOG" and "AUTOMATIC".



For the meaning of the status string, refer to the programming manual. The string is the reply to the ^D instruction

FOV: % SPEED VARIATION

At any moment, while in the "AUTOMATIC" mode, the value of the "work speed" defined in the program to be changed in the range **1% ...0%.. 200%**, the value of 0% is interpreted as leaving the value of the velocity defined by the program unaltered.


Use the  key to increase (in %) the value of the "work speed".

Use the  key to decrease (in %) the value of the "work speed".




If desired, using "F override", data can be entered directly. Press  to enter into the "DATA ENTRY" mode. Enter the required value (-99 ... 0 ... 100) and press the  key to confirm.

CHANGE PARAMETERS

This command will allow variables defined in the "Parameters" menu to be changed.

To activate, press the  key.

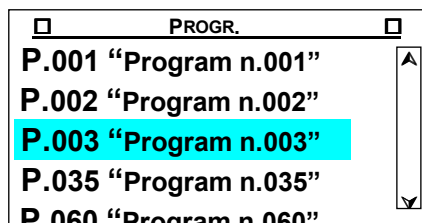
The first available parameter will be displayed. It may be modified by entering a new value (the original value will be displayed in brackets).

To scroll through the variables, use the  and  keys. To return to automatic, press the ESC  key.



PROGRAMMING


The "Programming" mode is the one in which all operations concerning the handling of programs in the GOYA are permitted: reading, writing, insertion, deleting.



Entering in this mode, the screen will show the list of programs present in the "PROGRAM MEMORY". Every line will carry the letter "P" (for program), the No. of the program and the name of the program.




SELECT PROGRAM

The  and  keys can be used to scroll through the list and position the cursor on the required program. The program selected is displayed on the screen in "REVERSE" colours.

After positioning the cursor on the required program, use the  key to enter the "DISPLAY/MODIFY A PROGRAM" page.

Alternatively, to move directly to the number of the program required, press the  key to enter the "DATA ENTRY" mode, enter the number of the program (1...200) and press the  to confirm

N.B.: if the program selected is not present in the memory (empty),
Automatically the " DISPLAY/MODIFY A PROGRAM " mode is entered.

To exit from the programming mode, press the  key.

ORGANISATION OF THE MEMORY

From the following figure, it is possible to see the organisation of the memory for handling and filing programs, where there are two memories:

Program memory

This memory is dedicated for saving work programs. It belongs to the CNC process. The data inside it, thanks to a back-up battery, are retained even when the power is removed from the equipment.

The space reserved for the PROGRAM MEMORY is **150,000** characters.

Work memory

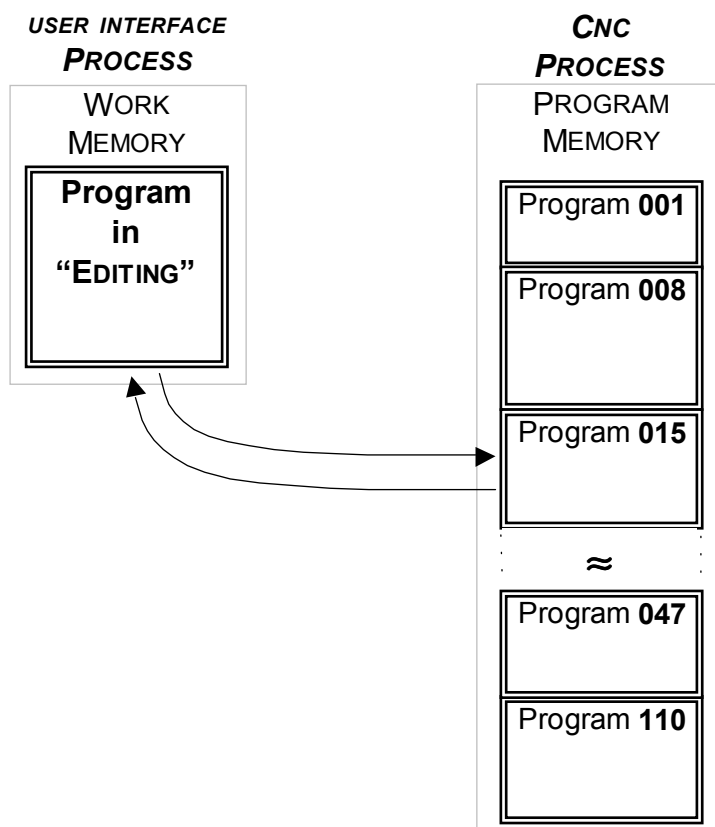
This memory contains the program that will be displayed, modified, inserted in the editing phase.

The data contained in this area of memory are not retained if the power is removed from the equipment.

The space reserved for the WORK MEMORY is **40,000** characters.



When "EDITING" a program in the WORK MEMORY, remember that the following limitations apply:

- 1) maximum length of a line : **80** characters
- 2) maximum number of lines of program : **999** lines



INSERT PROGRAM


To insert a new program (one that is not yet present in the "PROGRAM MEMORY"), press

the  key to recall the "DATA ENTRY" page and enter the number of the program (1...200). Then press the  key to confirm.

If the program is empty the GOYA runs the editing function to insert the first program line.

DELETE A PROGRAM

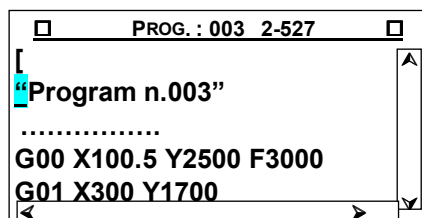
After positioning the cursor on the required program in the "SELECT PROGRAM" mode,

press the  key to delete it. Before proceeding to delete the program, the GOYA asks the operator to confirm the request.

DISPLAY / MODIFY A PROGRAM

Entering this mode, the program selected will appear on the screen. The program is made up of "lines" /strings of characters that define the relative instructions and/or comments).



The number of the program selected, the number of the line on which the cursor is positioned and the number of column are displayed on the status line (1st line at the top).





The procedure is to all effects a **full screen editor**, which means that it is possible to move the cursor to the required position, in order to display, modify, or insert modifications at any point in the program.

In particular, the functions available are:

MOVE CURSOR

The  e  keys can be used to scroll the lines of the program up and down, in order to position it on the required line.


The  e  keys can be used to move the cursor backwards and forwards along the line, in order to position it on the required character.

INSERT / OVERWRITE A CHARACTER

During the operation of "EDITING" a program, it is possible to use two different modes of working :


1) INSERT ENABLED (cursor: " _ ")

If the insert function is active, pressing an alphanumeric key will cause a character to be inserted starting from the position of the cursor. The characters to the right of the cursor will consequently move to the right to make room for the new characters inserted.


The "INSERT ENABLED" mode is activated by the  key.

2) INSERT DISABLED (cursor: " █ ")

If the insert function is disabled, pressing an alphanumeric key will cause the character to be typed on top of the character over which the cursor is placed.


The "INSERT DISABLED" mode is activated by the  key.


DELETING CHARACTERS

When the  key is pressed, the character immediately to the left of the cursor will be deleted.


INSERTING A NEW LINE

To insert a new line of program:

- 1) Enable the mode: INSERT ENABLED (cursor: “_”)
- 2) Position the cursor immediately to the right of the last character of the line after which it is required to insert the new line.
- 3) Press the  key to insert the new line. The following lines will automatically be shifted one place towards the bottom.



Naturally, if the line of program is the last, the  key adds the new line automatically at the end of the program.

DELETING A LINE




Position the cursor on the first character of the line following the line that needs to be deleted and use the  in sequence until all the characters of the line have been deleted.

STORING A PROGRAM

The program being edited is resident in the working memory, whose contents are volatile, which means that they are not stored after power is removed. Furthermore a program contained in this memory cannot be run in the “AUTOMATIC” mode. Once the required modifications have been made, the program must be saved in the program memory.

To store a program which has been worked on by transferring it from the “WORK MEMORY” to the “PROGRAM MEMORY”, press the  key. The display on the screen will ask for confirmation of the request. Press the  to confirm.

A menu will now be displayed showing all the saved programs. A questo punto si può procedere in due modi:

1. If you wish to overwrite a program, move to the program to be overwritten and press .
2. If you do not wish to overwrite a program, use the  key to enter a new unused program number and press .



EXIT FROM EDITING


Use the  key to exit from the EDITING mode.

Before leaving the EDITING mode, the operator will be asked if the program in the “WORK MEMORY” should be saved in the “PROGRAM MEMORY”.

TERMINAL

This procedure is used to connect the CNC process in direct mode. It is thus possible to send strings of instructions (see: CNC – instruction manual). Type directly on the GOYA keyboard to the CNC process and see the relative reply on the screen.

The instruction string typed can be corrected, before being confirmed ( key), using the  key.

To send the “IMMEDIATE INSTRUCTIONS”, such as <Ctrl-W>, <Ctrl-O> etc. (for their meanings see the CNC instruction manual) press the  key followed by the letter required.

Use the  key to exit from the TERMINAL mode.

CONNECTION TO A PC





This mode is used to work with the relative “BACH” support software to dialogue and handle the “CNC process” inside the GOYA from the PC over a serial link.

For the communication protocol, see Appendix 2. For the physical connections refer to the chapter “CONNECTION TO SERIAL PORT NO. 1”

CNC SELECTION

This function is used to select an internal CNC, external CNC on COM1 or COM2 (usually the internal CNC of the GOYA is used).

If an external CNC is selected, all operations to it will be re-addressed through COM1 or COM2.


To change the selection, use the  and  keys, then confirm the selection with the  key. The screen will show a message to confirm that communications have been successfully established or, if the attempt has failed, an error message. To continue, press the  key again.

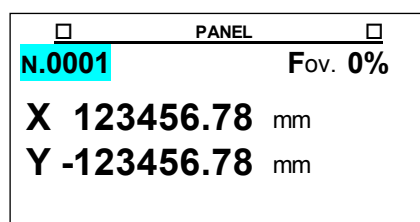
OPERATOR PANEL MODE



The operating mode allows a program to be run from the command from a logic input of the Goya. When an input assumes its active state, the corresponding program is launched. The inputs can be defined as active when the key is pressed down, and/or







active when the key is released. The table for the correspondence between the inputs and programs that are run is shown below. Some of the programs that are launched in this way correspond to actions in the jog mode. For example, program 116 is run to perform the machine zero seeking in either jog mode or automatic mode. If program 101 is not present, the manual displacement key functions as described in the related paragraphs. If program 101 does exist, to an instruction to make a positive displacement on the X-axis, the program will be executed.

Number of input	Program on key down	Associated key	Program on key up	Associated key
1	101	X+	121	X+
2	102	X-	122	X-
3	103	Y+	123	Y+
4	104	Y-	124	Y-
5	105	Z+	125	Z+
6	106	Z-	126	Z-
7	107		127	
8	108		128	
9	109		129	
10	110		130	
11	111		131	
12	112		132	
13	113		133	
14	114		134	
15	115		135	
16	116	Machine zero	136	Machine zero

The OPERATOR PANEL MODE can be activated from the main menu by pressing the  key, or if the Goya has been programmed with the panel active (@97,1), the Goya automatically starts up in this mode each time it is switched on. If active, the PANEL page is displayed (see following figure):



The PARAMETERS menu is used to change the value of a variable, press the  key; the  key can be used to change the velocity of the execution of axis movement.

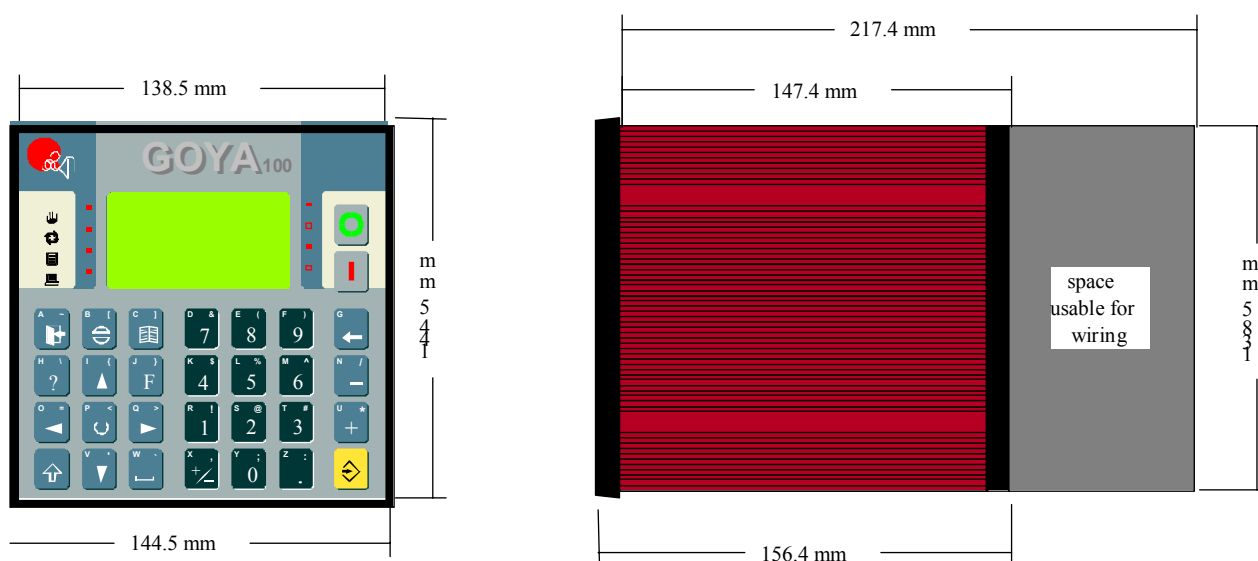
Pressing the  key or the  or  keys or the  or  keys disables the panel, returning the control to the initial menu: to re-enable the panel, press the  key.

AUTOMATIC PROGRAM LAUCH ON START-UP

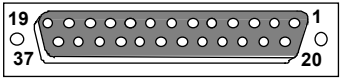
If there is a program number 100, it will be executed each time the controller is powered up. Remember that each time the unit is restarted, the machine zero seeking procedure must be performed as the unit cannot possibly keep track of any movements that could have taken place while it was not operating and it does not store the co-ordinates in non-volatile memory. If it is necessary to perform a movement, it will always be necessary to perform the zero seeking procedure for the axis concerned.

TECHNICAL DATA


POWER SUPPLY VOLTAGE	+24VDC (+19VDC ... +35VDC)
CONSUMPTION	6 W
STOCKING TEMPERATURE	0 to +50 C°
WORKING TEMPERATURE	+5 to +40 C°
RELATIVE HUMIDITY	20% ... 80% (NON-CONDENSING)
WEIGHT	0.8 kg
DIMENSION	WIDTH: 144.5 mm HEIGHT: 144.5 mm DEPTH: 156.4 mm

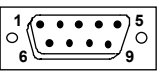


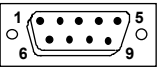
GOYA CONNECTORS

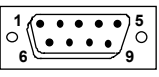
INPUT / OUTPUT		
		
DB-37 FEMALE CONNECTOR X1		
Pin	Signal	I/O
1	INP1	I
2	INP2	I
3	INP3	I
4	INP4	I
5	INP5	I
6	INP6	I
7	INP7 (HOME \odot)	I
8	INP8 (HOME \otimes)	I
9	INP9 (Ls \odot +))	I
10	INP10 (Ls \ominus -)	I
11	INP11 (Ls \odot +))	I
12	INP12 (Ls \ominus -)	I
13	INP13	I
14	INP14	I
15	INP15	I
16	INP16	I
17	+24VDC	-
18	N.C.	-
19	N.C.	-
20	OUT1	O
21	OUT2	O
22	OUT3	O
23	OUT4	O
24	OUT5	O
25	OUT6	O
26	OUT7	O
27	OUT8	O
28	+24VDC	-
29	+24VDC	-
30	+24VDC	-
31	+24VDC	-
32	Com 24VDC	-
33	Com 24VDC	-
34	Com 24VDC	-
35	Com 24VDC	-
36	Com 24VDC	-
37	N.C.	-

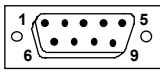
OUTPUT: TYPE PNP 24Vdc/300MA
INPUT: TYPE PNP 24VDC

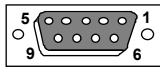
POWER SUPPLY	
	
3 PIN CIRCULAR MALE CONNECTOR X10	
Pin	Signal
1	+24VDC
2	GROUND
3	Com 24VDC

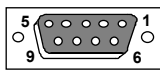
SERIAL PORT 1		
		
DB-9 MALE CONNECTOR X2		
Pin	RS232	RS422
1		
2	Rx \odot	Rx+ \odot
3	Tx \odot	Tx+ \odot
4		
5	COM (0V)	
6		
7	RTS \odot	Tx- \odot
8	CTS \odot	Rx- \odot
9		

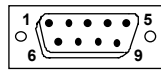
SERIAL PORT 2 (RS232)		
		
DB-9 MALE CONNECTOR X6		
Pin	Signal	I/O
1		
2	Rx \otimes	I
3	Tx \otimes	O
4		
5	Com (0V)	-
6		
7		
8		
9		

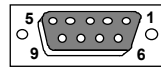
CAN BUS		
		
DB-9 MALE CONNECTOR X3		
Pin	Signal	I/O
1		
2	CAN L	I
3	COM (0V)	-
4		
5		
6		
7	CAN H	I
8		
9		


AMPLIFIER: AXIS 1 (X)		
		
DB-9 MALE CONNECTOR X4		
Pin	Signal	I/O
1	AGND(AN.REF.)	-
2	FLT \odot (FAULT)	I
3	PULSE \odot	O
4		
5	GND_AZN (0V)	-
6	Ao \odot (+VOUT)	O
7	ENB \odot (ENABLE)	O
8	DIR \odot	O
9		-

ENCODER: AXIS 1 (X)		
		
DB-9 FEMALE CONNECTOR X8		
Pin	Signal	I/O
1	GND_ENC (0V)	-
2	+VENC (+5V)	-
3	ZE \odot +	I
4	FB \odot +	I
5	FB \odot -	I
6		-
7	ZE \odot -	I
8	FA \odot -	I
9	FA \odot +	I

ANALOG INPUT		
		
DB-9 FEMALE CONNECTOR X7		
Pin	Signal	I/O
1	COM	-
2	AIN1	I
3	AIN2	I
4	AIN3	I
5	+5VREF	I
6	AIN4	I
7	AIN5	I
8	AIN6	I
9		

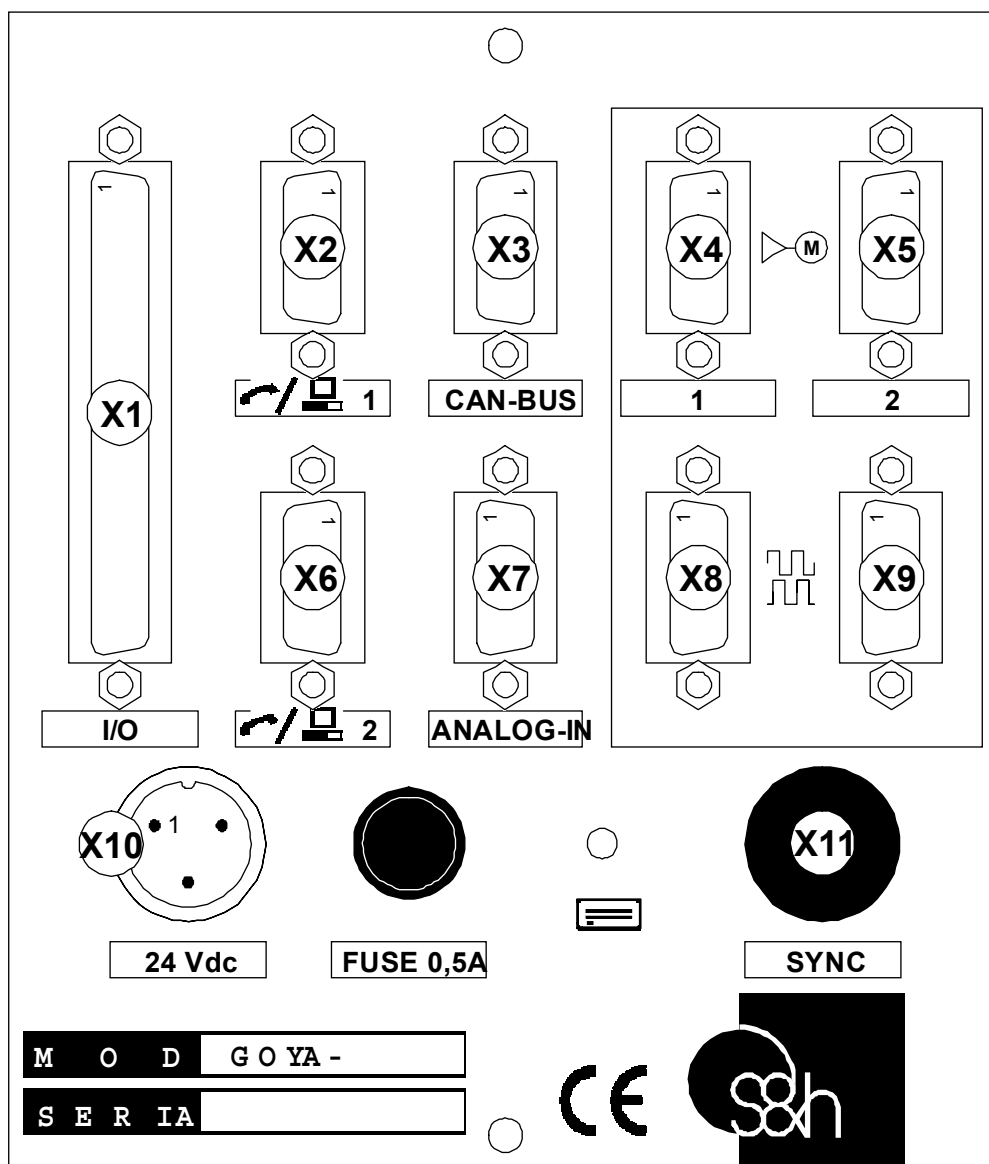
AMPLIFIER: AXIS 2 (Y)		
		
DB-9 MALE CONNECTOR X5		
Pin	Signal	I/O
1	AGND(AN.REF.)	-
2	FLT \odot (FAULT)	I
3	PULSE \otimes	O
4		
5	GND_AZN (0V)	-
6	Ao \otimes (+VOUT)	O
7	ENB \otimes (ENABLE)	O
8	DIR \otimes	O
9		-

ENCODER: AXIS 2 (Y)		
		
DB-9 FEMALE CONNECTOR X9		
Pin	Signal	I/O
1	GND_ENC (0V)	-
2	+VENC (+5V)	-
3	ZE \otimes +	I
4	FB \otimes +	I
5	FB \otimes -	I
6		-
7	ZE \otimes -	I
8	FA \otimes -	I
9	FA \otimes +	I

SYNC	
	
3 PIN CIRCULAR FEMALE CONNECTOR X11	
Pin	Signal
1	SINC_TX
2	COM (0V)
3	SINC_RX

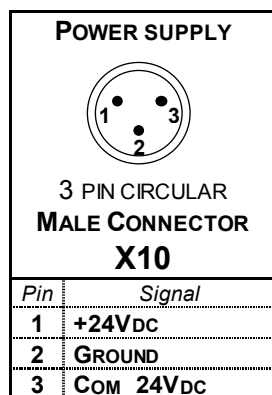
N.B.: see appendix 1 for 3 axes Goya

GOYA BACK PANEL



GOYA POWER SUPPLY

CONNECTOR: X10



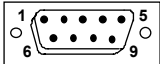
The CNC GOYA requires a power supply voltage of +24VOLT d.c..This can be supplied via the X10 connector found on the back panel.

The technical data of power supply are:

POWER SUPPLY VOLTAGE	+24VDC (+19VDC ... +35VDC)
CONSUMPTION	6W

CONNECTION TO SERIAL PORT NO.1

CONNECTOR: X2

SERIAL PORT 1				
				
DB-9 MALE CONNECTOR X2				
Pin	RS232		RS422	
			2	
1				
2	Rx \ominus		Rx+ \ominus	
3	Tx \ominus	o	Tx+ \ominus	o
4				
5	Com (0V)			
6				
7	Rts \ominus	o	Tx- \ominus	o
8	Cts \ominus		Rx- \ominus	
9				

SERIAL PORT 1		
RS232		
(a)		
Pin	Segnale	I/O
1		
2	Rx \ominus	
3	Tx \ominus	o
4		
5	Com (0V)	-
6		
7	Rts \ominus	o
8	Cts \ominus	
9		

SERIAL PORT 1		
RS422		
(b)		
Pin	Segnale	I/O
1		
2	Rx+ \ominus	
3	Tx+ \ominus	o
4		
5	Com (0V)	-
6		
7	Tx- \ominus	o
8	Rx- \ominus	
9		




- Note: (a) Factory set = RS232
(b) Only on specific order

To connect a GOYA with a PC (through serial line RS232), perform these steps:

- Connect the PC serial port (COM1 or COM2) with the GOYA serial port n.1 (connector X2) with a serial cable "cross over" standard for PC (Cable pin connections :

1-4, 2-3, 3-2, 4-1, 5-5, 7-8, 8-7, 9-9)

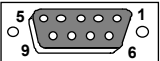
Note: the power must be removed from the PC and the GOYA

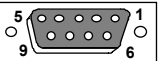
- Power up the GOYA
- With the "arrow keys",  and  move the cursor and select the menu line: "Connection to PC", then confirm with  key.
- Power up the PC and use the BACH software program, or another standard PC communication program (e.g.. Hyper Terminal of Windows) to communicate with the Goya .
- The protocol parameters of serial line are defined in Appendix 2.

Note: Use a shielded cable, the screen must be isolated and connected to the casing of connectors.

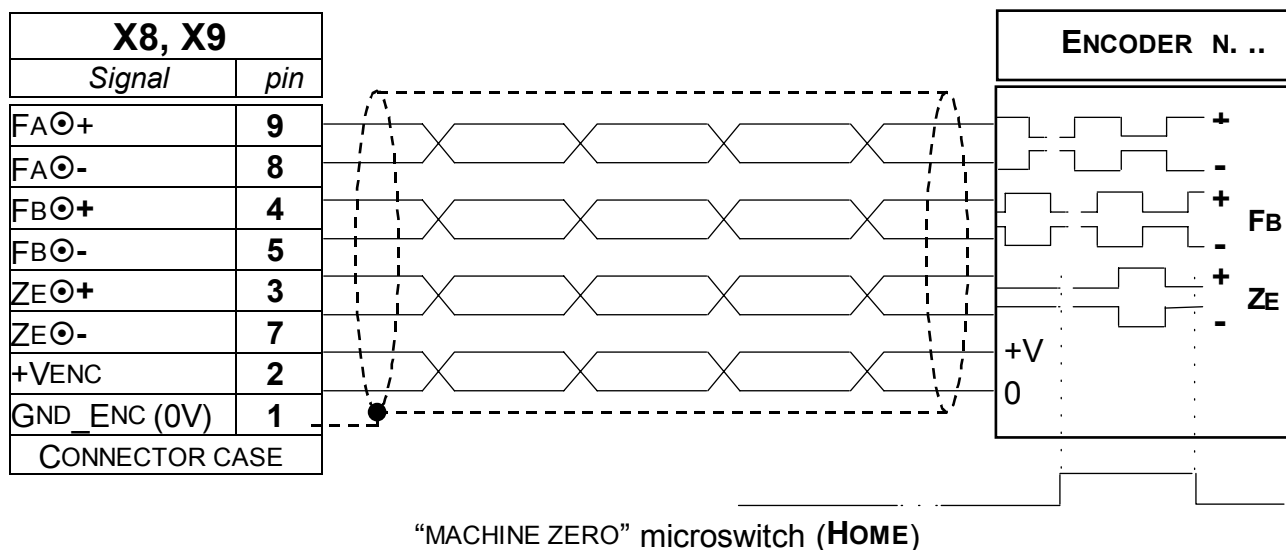
ENCODER CONNECTIONS

CONNECTORS: X8, X9

AXIS 1 (X) ENCODER		
		
9-POLE FEMALE D-CONNECTOR		
X8		
Pin	Signal	I/O
1	GND_ENC (0V)	-
2	+VENC (+5V)	-
3	ZE⓪+	
4	FB⓪+	
5	FB⓪-	
6		-
7	ZE⓪-	
8	FA⓪-	
9	FA⓪+	

AXIS 2 (Y) ENCODER		
		
9-POLE FEMALE D-CONNECTOR		
X9		
Pin	Signal	I/O
1	GND_ENC (0V)	-
2	+VENC (+5V)	-
3	ZE⓪+	
4	FB⓪+	
5	FB⓪-	
6		-
7	ZE⓪-	
8	FA⓪-	
9	FA⓪+	

Notes: The encoder interface is factory configured as specified in the configuration sheet supplied with the products.



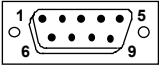
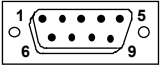
It is strongly advised that a “DIFFERENTIAL” type of encoder interface is used. It is indispensable if the distance to the encoder exceeds 3 metres or if the environment in which the system operates is subject to electrical interference of any kind.

Use a screened twisted pair cable for the connection to the encoder. The screen must be isolated and connected to ground only to the casing of the connector at the controller end. Furthermore, the screen connections must be made as close as possible to the connector casing.

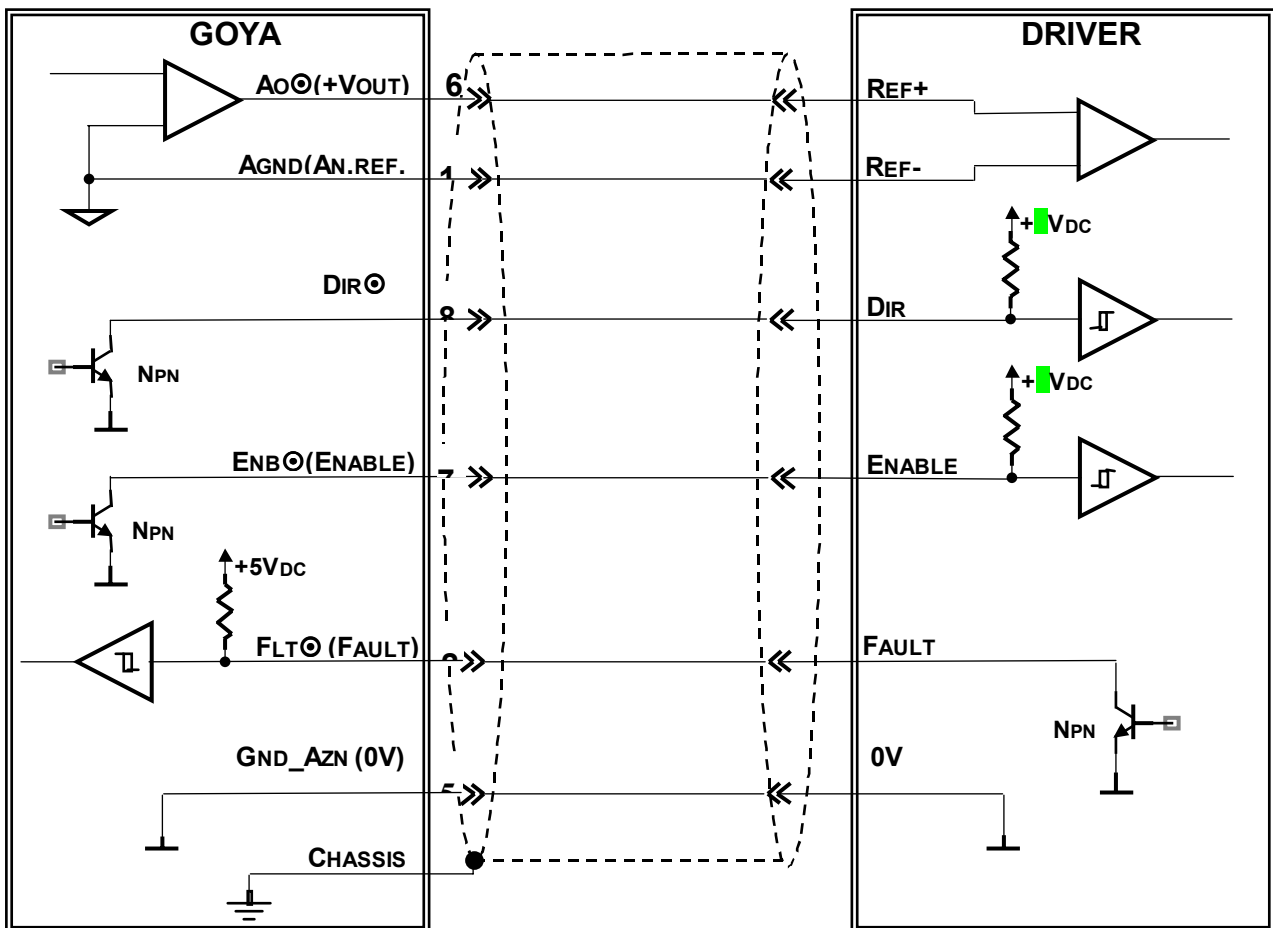
The maximum count frequency that the Goya can handle is 40kHz, which when the x4 multiplier performed inside the Goya itself is considered, brings this up to an effective maximum frequency of 160kHz.

DRIVE CONNECTIONS (ANALOGUE)

CONNECTORS: X4, X5

AXIS 1 (X) DRIVER			AXIS 2 (Y) DRIVER		
 <p>9 POLE MALE D-CONNECTOR X4</p>			 <p>9 POLE MALE D-CONNECTOR X5</p>		
Pin	Signal	I/O	Pin	Signal	I/O
1	AGND(AN.REF.)	-	1	AGND(AN.REF.)	-
2	FLTⓄ (FAULT)	I	2	FLTⓄ (FAULT)	I
3		O	3		O
4			4		
5	GND_AZN (0V)	-	5	GND_AZN (0V)	-
6	AoⓄ (+VOUT)	O	6	AoⓄ (+VOUT)	O
7	ENBⓄ (ENABLE)	O	7	ENBⓄ (ENABLE)	O
8	DIRⓄ	O	8	DIRⓄ	O
9			9		

Note: The DIRⓄ SIGNAL must only be connected if required



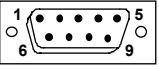
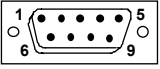
Note: The cable screen must be connected to the casing of the controller

Note: If the DRIVER does not have internal pull-up resistors, these must be provided externally

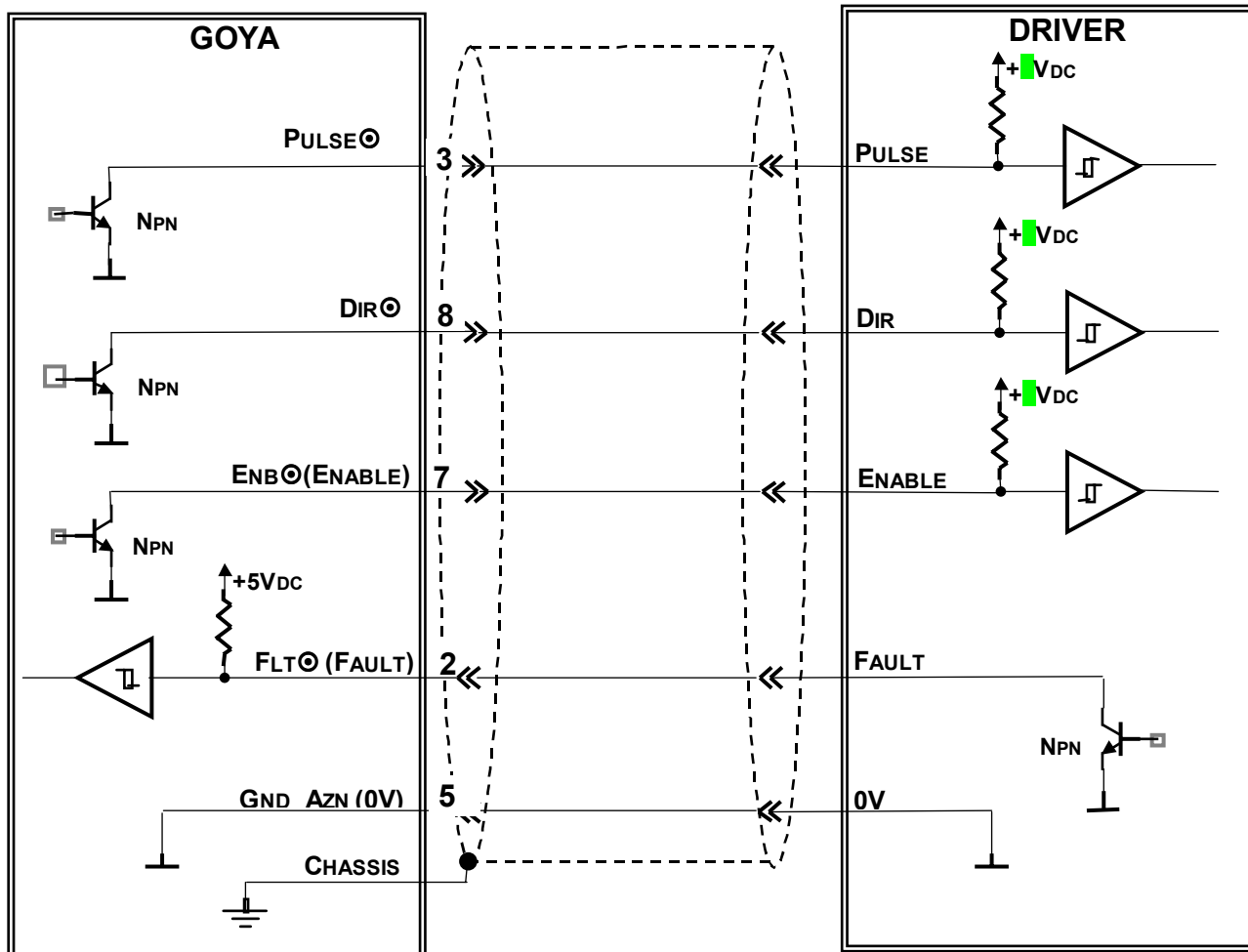
The analogue drive output, +VOUT is $\pm 10V$ with 12-bit resolution.

DRIVER CONNECTIONS (FREQUENCY)

CONNECTORS: X4, X5

AXIS 1 (X) DRIVER			AXIS 2 (Y) DRIVER		
 <p>9-POLE MALE D-CONNECTOR X4</p>			 <p>9-POLE MALE D-CONNECTOR X5</p>		
Pin	Signal	I/O	Pin	Signal	I/O
1		-	1		-
2	FLT⓪ (FAULT)	I	2	FLT⓪ (FAULT)	I
3	PULSE⓪	O	3	PULSE⓪	O
4		-	4		-
5	GND_AZN (0V)	-	5	GND_AZN (0V)	-
6		O	6		O
7	ENB⓪(ENABLE)	O	7	ENB⓪(ENABLE)	O
8	DIR⓪	O	8	DIR⓪	O
9		-	9		-

N.B.: see appendix 1
for 3 axes Goya



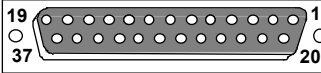
Note: The cable screen must be connected to the casing of the controller

Note: If the **DRIVER** does not have internal pull-up resistors, these must be provided externally

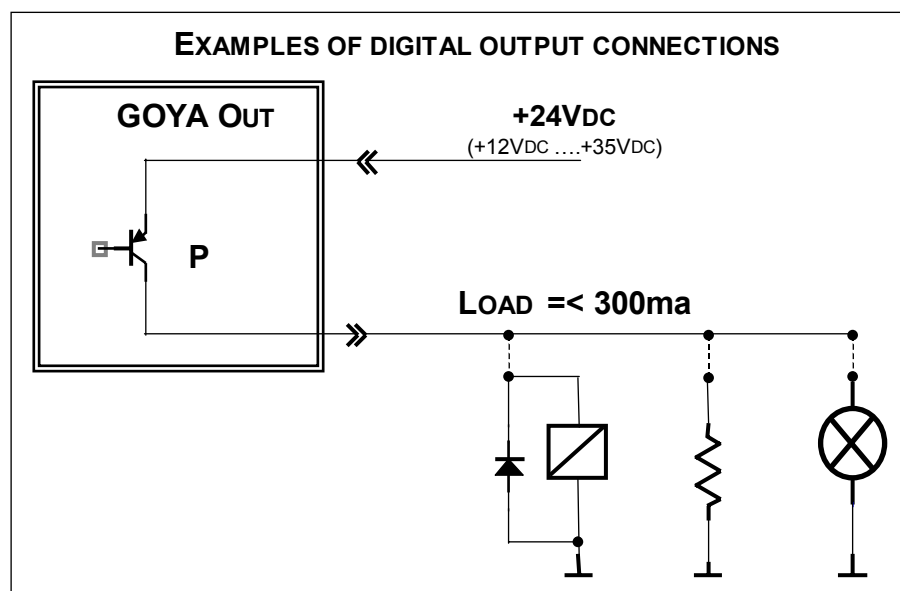
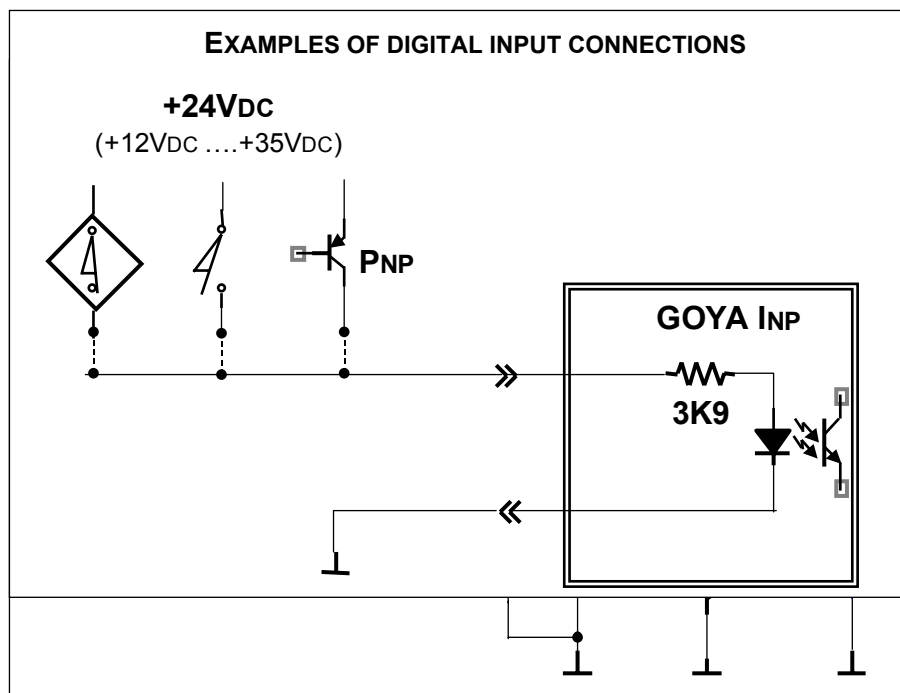
The frequency of the drive output, **Pulse** is a maximum of 100kHz with a duty cycle of 50%

DIGITAL INPUT CONNECTIONS

TERMINAL: X1

INPUTS / OUTPUTS		
		
37-POLE FEMALE D-CONNECTOR		
X1		
Pin	Signal	I/O
1	INP1	I
2	INP2	I
3	INP3	I
4	INP4	I
5	INP5	I
6	INP6	I
7	INP7 (HOME \odot)	I
8	INP8 (HOME \odot)	I
9	INP9 (Ls \odot +))	I
10	INP10 (Ls \odot -)	I
11	INP11 (Ls \odot +))	I
12	INP12 (Ls \odot -)	I
13	INP13	I
14	INP14	I
15	INP15	I
16	INP16	I
17	+24Vdc	-
18	N.C.	
19	N.C.	
20	OUT1	O
21	OUT2	O
22	OUT3	O
23	OUT4	O
24	OUT5	O
25	OUT6	O
26	OUT7	O
27	OUT8	O
28	+24Vdc	-
29	+24Vdc	-
30	+24Vdc	-
31	+24Vdc	-
32	COM 24Vdc	-
33	COM 24Vdc	-
34	COM 24Vdc	-
35	COM 24Vdc	-
36	COM 24Vdc	-
37	N.C.	

Outputs: type PNP 24Vdc/300mA
 Inputs: type PNP 24Vdc



N.B.: see appendix 1 for 3 axes Goya

GOYA IMAGE OF INPUTS 31....0

		IMAGE OF INPUTS 31...0																															
Bit / Input		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

Bit	Input	Description	Connector / pin
00	INP1	DIGITAL INPUT N. 1	X1-1
01	INP2	DIGITAL INPUT N. 2	X1-2
02	INP3	DIGITAL INPUT N. 3	X1-3
03	INP4	DIGITAL INPUT N. 4	X1-4
04	INP5	DIGITAL INPUT N. 5	X1-5
05	INP6	DIGITAL INPUT N. 6	X1-6
06	INP7 (HOME①)	DIGITAL INPUT N. 7 (HOME INPUT: AXIS ①)	X1-7
07	INP8 (HOME②)	DIGITAL INPUT N. 8 (HOME INPUT: AXIS ②)	X1-8
08	INP9 (Ls①+)	DIGITAL INPUT N. 9 (FORWARD LIMIT (+): AXIS ①)	X1-9
09	INP10 (Ls①-)	DIGITAL INPUT N. 10 (REVERSE LIMIT (-): AXIS ①)	X1-10
10	INP11 (Ls②+)	DIGITAL INPUT N. 11 (FORWARD LIMIT (+): AXIS ②)	X1-11
11	INP12 (Ls②-)	DIGITAL INPUT N. 12 (REVERSE LIMIT (-): AXIS ②)	X1-12
12	INP13	DIGITAL INPUT N. 13	X1-13
13	INP14	DIGITAL INPUT N. 14	X1-14
14	INP15	DIGITAL INPUT N. 15	X1-15
15	INP16	DIGITAL INPUT N. 16	X1-16
16	Sw1	DIP SWITCH	
17	Sw2	DIP SWITCH	
18	Sw3	DIP SWITCH	
19	Sw4	DIP SWITCH	
20	FLT①	FAULT INPUT: AMPLIFIER ①	X4-2
21	FLT②	FAULT INPUT: AMPLIFIER ②	X5-2
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

Note: To read the inputs from the CNC program, use the instructions :

G66 P0...P15
G65 P0...P15
G69 P0...P15

To see the image of the inputs, use the instruction:
%81 Q217
 (see the programming manual)

N.B.: see appendix 1 for 3 axes Goya

GOYA IMAGE OF OUTPUTS 31....0

IMAGE OF OUTPUTS 31...0

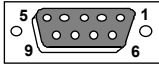
Bit / ingresso	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
-------------------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

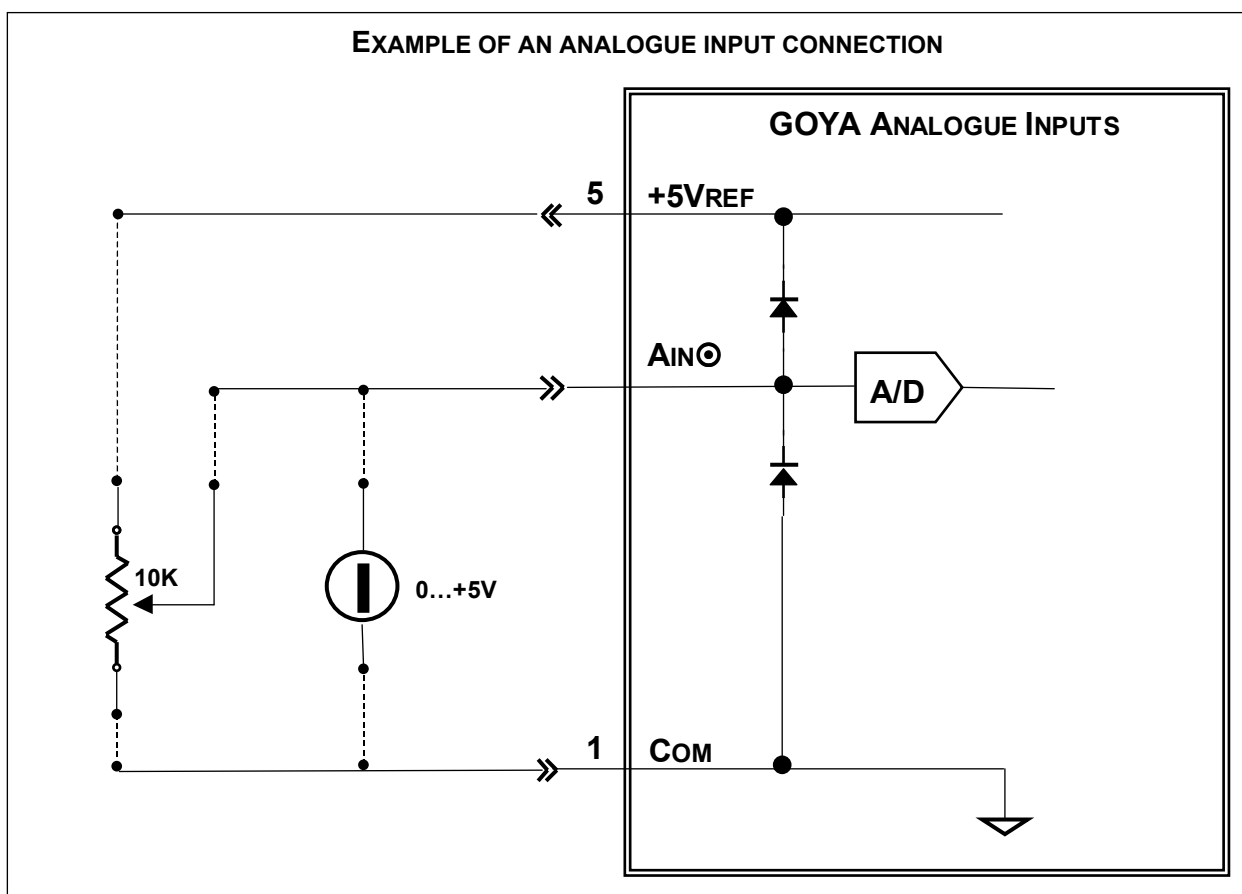
Bit	Output	Description	Connector / pin
00	OUT1	DIGITAL OUTPUT N. 1	X1-20
01	OUT2	DIGITAL OUTPUT N. 2	X1-21
02	OUT3	DIGITAL OUTPUT N. 3	X1-22
03	OUT4	DIGITAL OUTPUT N. 4	X1-22
04	OUT5	DIGITAL OUTPUT N. 5	X1-23
05	OUT6	DIGITAL OUTPUT N. 6	X1-24
06	OUT7	DIGITAL OUTPUT N. 7	X1-25
07	OUT8	DIGITAL OUTPUT N. 8	X1-26
08			
09			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

Note: To write the outputs from the CNC program, use the instructions :
G67 P0...P7
G68 P0...P7
 To see the image of the inputs, use the instruction:
%81 Q218
 (see the programming manual)

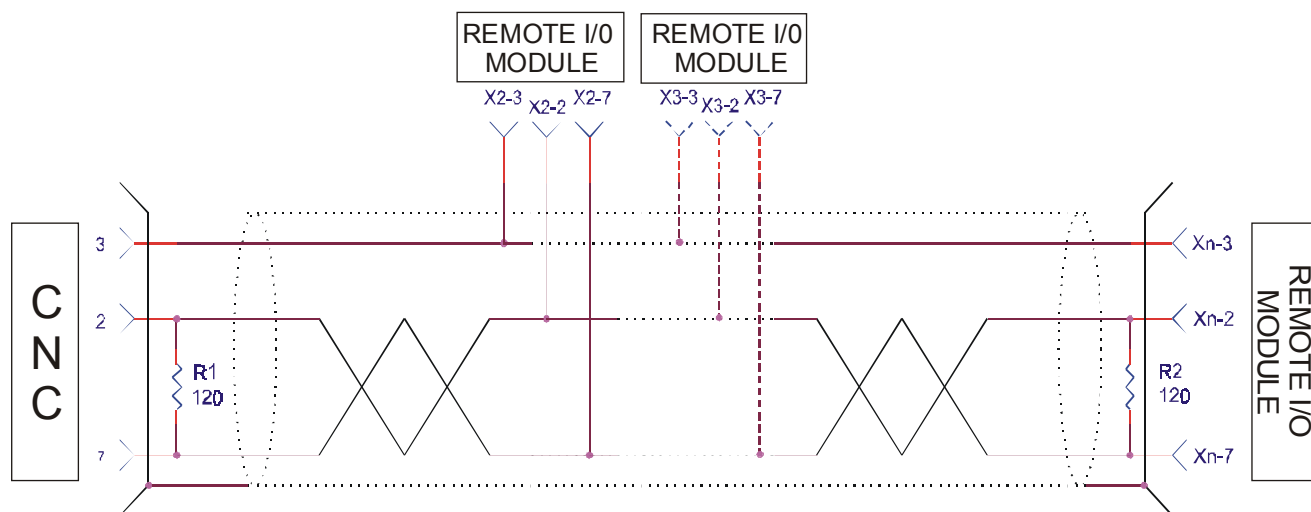
ANALOGUE INPUT CONNECTIONS

CONNECTOR: X7

ANALOGUE INPUTS		
		
9-POLE FEMALE D-CONNECTOR		
X7		
Pin	Signal	I/O
1	COM	-
2	AIN1	
3	AIN2	
4	AIN3	
5	+5VREF	
6	AIN4	
7	AIN5	
8	AIN6	
9		



CANBUS CONNECTION



The termination resistances (120Ω) are placed at the beginning, in the CNC connector, and at the end of the cable (see figure).

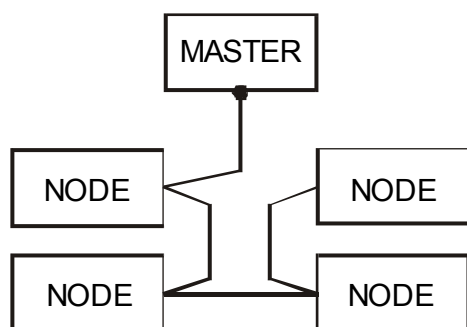
The connection devices in intermediate positions do not require a termination resistance.

Belden 3082A or equivalent cable is recommended.

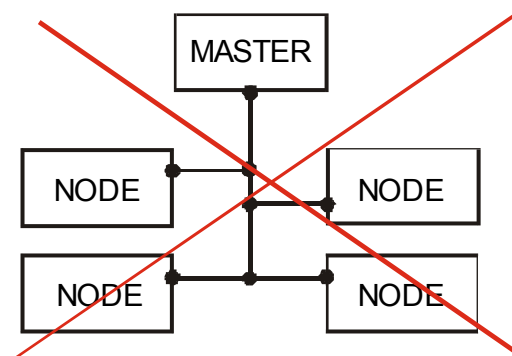
The screen must be connected to the casing of the connectors.

INSTALLATION ADVICE

1. The devices on the network must be connected in cascade.
2. Star or tree configurations must be avoided (see following figure).



**CONFIGURAZIONE
ALLOWED**



**CONFIGURAZIONE
NOT ALLOWED**

CANBUS network configuration

3. Use the same type of cable for the whole installation (screened twisted pair).
4. The screen must be connected to the casing of the connector at the Goya end. It must not be connected to the casing of connectors for intermediate devices. It is also connected to the last connector in the line at C1.

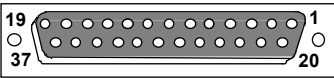
APPENDIX 1 - 3 AXES CONTROL

This appendix describes the features of the 3-axes control of the Goya where they differ from the control on 1 or 2 axes.

For all the features not specifically mentioned in the following, presume that these are identical for all three types of control.

GOYA CONNECTORS

INPUT / OUTPUT




**DB-37
FEMALE CONNECTOR
X1**

Pin	Segnale	I/O
1	INP1	
2	INP2	
3	INP3	
4	INP4	
5	INP5	
6	INP6 (HOME [Ⓝ])	
7	INP7 (HOME [Ⓞ])	
8	INP8 (HOME [Ⓟ])	
9	INP9 (Ls ^{Ⓞ+})	
10	INP10 (Ls ^{Ⓞ-})	
11	INP11 (Ls ^{Ⓟ+})	
12	INP12 (Ls ^{Ⓟ-})	
13	INP13 (Ls ^{Ⓝ+})	
14	INP14 (Ls ^{Ⓝ-})	
15	INP15	
16	INP16	
17	+24Vdc	
18	N.C.	
19	N.C.	
20	OUT1	
21	OUT2	
22	OUT3	
23	OUT4	
24	OUT5	
25	OUT6	O
26	OUT7	O
27	OUT8	O
28	+24Vdc	-
29	+24Vdc	-
30	+24Vdc	-
31	+24Vdc	-
32	COM 24Vdc	-
33	COM 24Vdc	-
34	COM 24Vdc	-
35	COM 24Vdc	-
36	COM 24Vdc	-
37	N.C.	

OUTPUT: TYPE PNP 24Vdc/300MA
INPUT: TYPE PNP 24Vdc

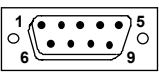
POWER SUPPLY



**3 PIN CIRCULAR
FEMALE CONNECTOR
X10**

Pin	Signal
1	+24Vdc
2	GROUND
3	COM 24Vdc

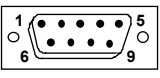
SERIAL PORT 1



**DB-9
MALE CONNECTOR
X2**

Pin	RS232	RS422
1		
2	Rx [Ⓞ] Rx ^{Ⓞ+}	
3	Tx [Ⓞ] Tx ^{Ⓞ+}	
4		
5	COM (0V)	
6		
7	RTS [Ⓞ] TX ^{Ⓞ-}	
8	CTS [Ⓞ] RX ^{Ⓞ-}	
9		

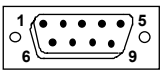
AMPLIFIER : AXIS 1 (X)



**DB-9
MALE CONNECTOR
X4**

Pin	Signal	I/O
1	AGND(AN.REF.)	-
2	FLT [Ⓞ] (FAULT)	I
3	PULSE [Ⓞ]	O
4		
5	GND_AZN (0V)	-
6	Ao [Ⓞ] (+VOUT)	O
7	ENB [Ⓞ] (ENABLE)	O
8	DIR [Ⓞ]	O
9		

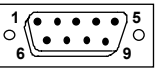
AMPLIFIER : AXIS 2 (Y)



**DB-9
MALE CONNECTOR
X5**

Pin	Signal	I/O
1	AGND(AN.REF.)	-
2	FLT [Ⓞ] (FAULT)	I
3	PULSE [Ⓞ]	O
4		
5	GND_AZN (0V)	-
6	Ao [Ⓞ] (+VOUT)	O
7	ENB [Ⓞ] (ENABLE)	O
8	DIR [Ⓞ]	O
9		

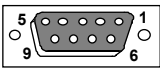
AMPLIFIER : AXIS 3 (Z)



**DB-9
MALE CONNECTOR
X6**

Pin	Signal	I/O
1	AGND(AN.REF.)	-
2	FLT [Ⓞ] (FAULT)	I
3	PULSE [Ⓞ]	O
4		
5	GND_AZN (0V)	-
6	Ao [Ⓞ] (+VOUT)	O
7	ENB [Ⓞ] (ENABLE)	O
8	DIR [Ⓞ]	O
9		

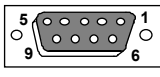
ENCODER: AXIS 1 (X)



**DB-9
FEMALE CONNECTOR
X8**

Pin	Signal	I/O
1	GND_ENC (0V)	-
2	+VENC (+5V)	-
3	ZE ^{Ⓞ+}	I
4	FB ^{Ⓞ+}	I
5	FB ^{Ⓞ-}	I
6		-
7	ZE ^{Ⓞ-}	I
8	FA ^{Ⓞ-}	I
9	FA ^{Ⓞ+}	I

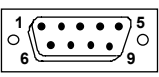
ENCODER : AXIS 2 (Y)



**DB-9
FEMALE CONNECTOR
X9**

Pin	Signal	I/O
1	GND_ENC (0V)	-
2	+VENC (+5V)	-
3	ZE ^{Ⓞ+}	I
4	FB ^{Ⓞ+}	I
5	FB ^{Ⓞ-}	I
6		-
7	ZE ^{Ⓞ-}	I
8	FA ^{Ⓞ-}	I
9	FA ^{Ⓞ+}	I

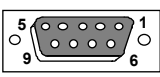
CAN BUS



**DB-9
MALE CONNECTOR
X3**

Pin	Signal
1	
2	CAN L
3	COM (0V)
4	
5	
6	
7	CAN H
8	
9	


ANALOG INPUT



**DB-9
FEMALE CONNECTOR
X7**

Pin	Signal	I/O
1	COM	-
2	AIN1	I
3	AIN2	I
4	AIN3	I
5	+5VREF	I
6	AIN4	I
7	AIN5	I
8	AIN6	I
9		

SYNC

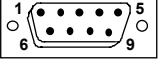
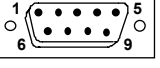
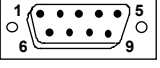


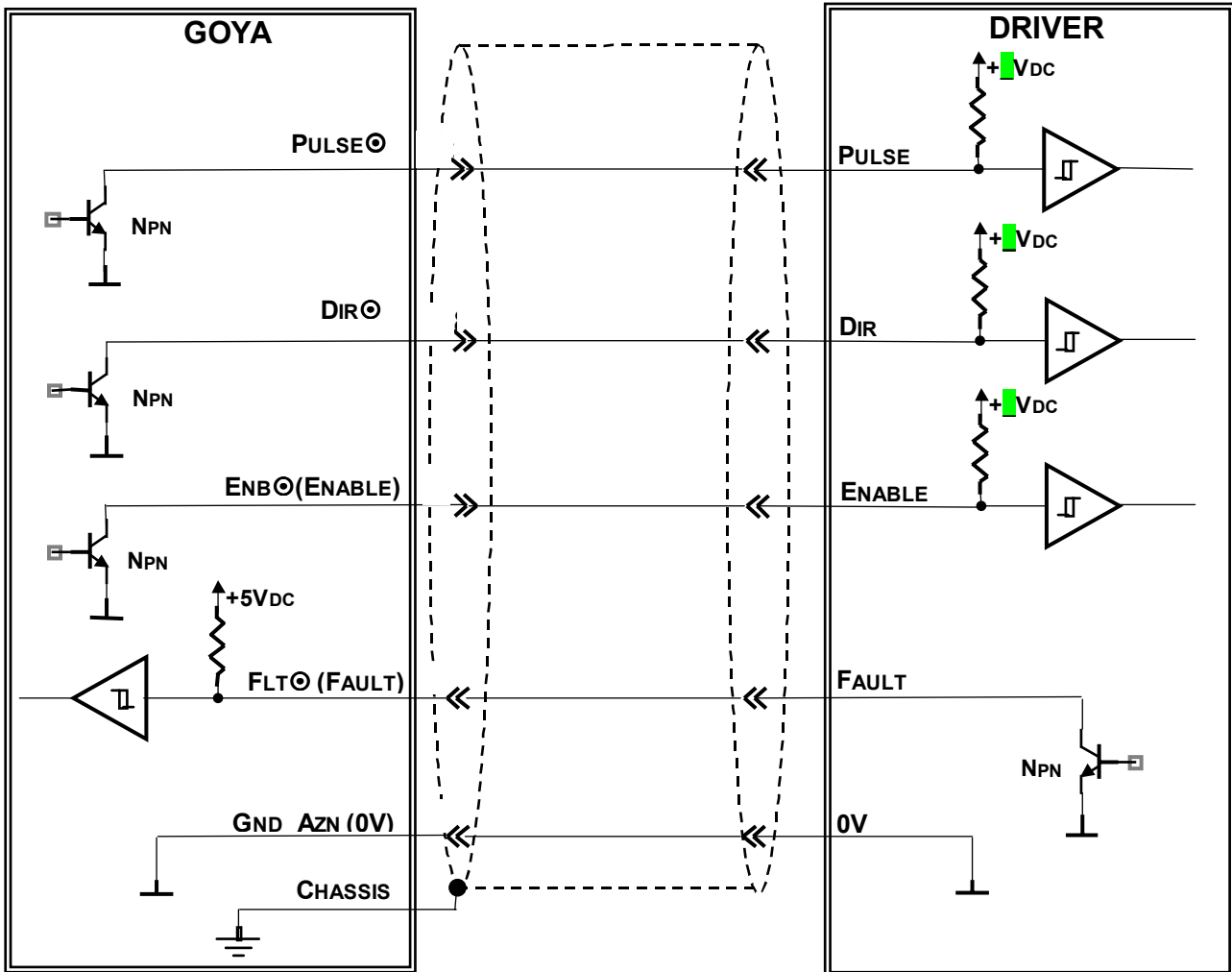
**3 PIN CIRCULAR
FEMALE CONNECTOR
X11**

Pin	Signal
1	SINC_TX
2	COM (0V)
3	SINC_RX

DRIVER CONNECTIONS (FREQUENCY)

CONNECTORS: X4, X5, X6

AXIS 1 (X) DRIVER			AXIS 2 (Y) DRIVER			AXIS 3 (Z) DRIVER		
 9-POLE MALE D-CONNECTOR X4			 9-POLE MALE D-CONNECTOR X5			 9-POLE MALE D-CONNECTOR X6		
Pin	Segnale	I/O	Pin	Segnale	I/O	Pin	Segnale	I/O
1		-	1		-	1		-
2	FLTⓈ (FAULT)	I	2	FLTⓈ (FAULT)	I	2	FLTⓈ (FAULT)	I
3	PULSEⓈ	O	3	PULSEⓈ	O	3	PULSEⓈ	O
4		-	4		-	4		-
5	GND_AZN (0V)	-	5	GND_AZN (0V)	-	5	GND_AZN (0V)	-
6		O	6		O	6		O
7	ENBⓈ (ENABLE)	O	7	ENBⓈ (ENABLE)	O	7	ENBⓈ (ENABLE)	O
8	DIRⓈ	O	8	DIRⓈ	O	8	DIRⓈ	O
9		-	9		-	9		-



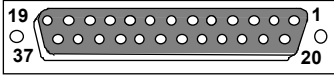
Note: The cable screen must be connected to the casing of the controller

Note: If the **DRIVER** does not have internal pull-up resistors, these must be provided externally

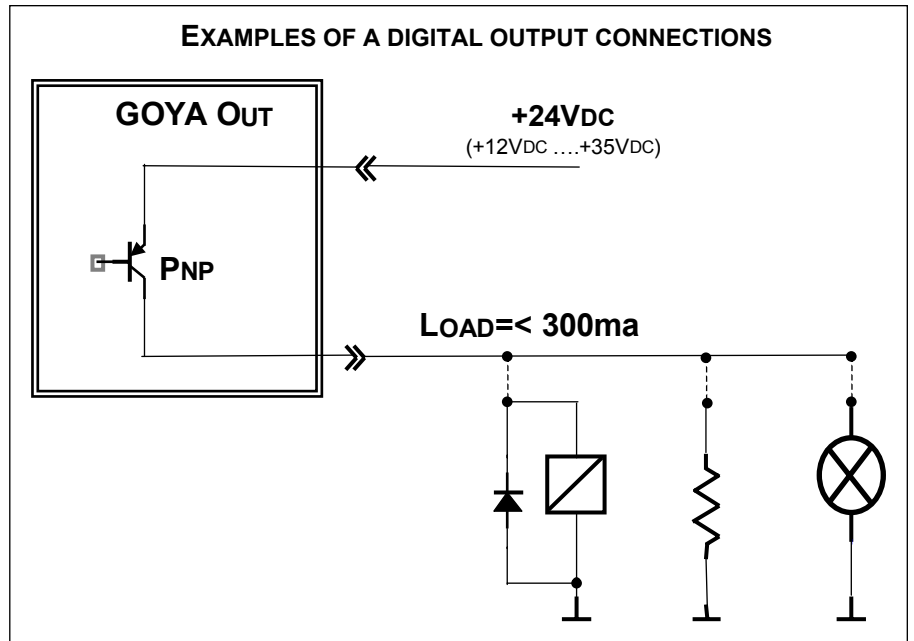
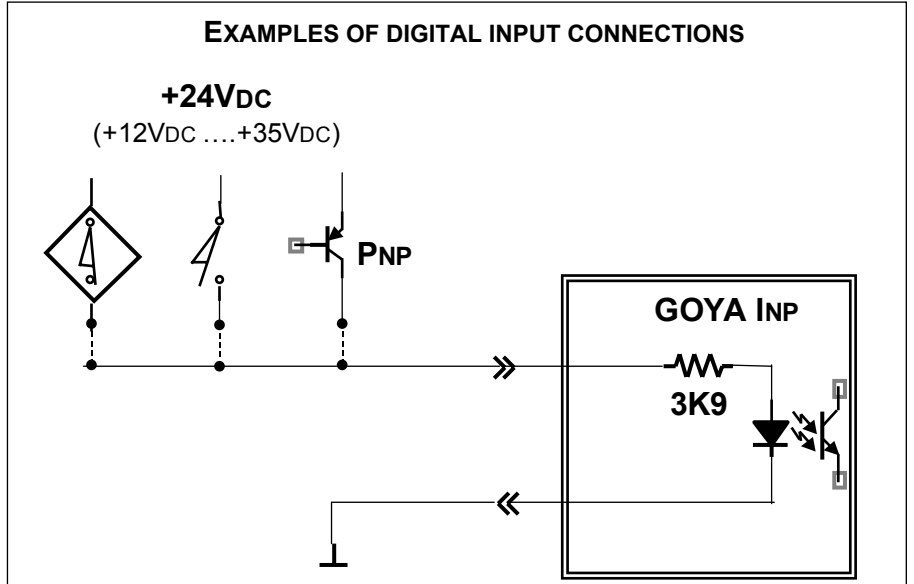
The frequency drive output, **PULSE** is a maximum of 100kHz with a duty cycle of 50%.

DIGITAL INPUT CONNECTIONS

TERMINAL: X1

INPUTS / OUTPUTS		
		
37-POLE FEMALE D-CONNECTOR		
X1		
Pin	Signal	I/O
1	INP1	I
2	INP2	I
3	INP3	I
4	INP4	I
5	INP5	I
6	INP6 (HOME③)	I
7	INP7 (HOME①)	I
8	INP8 (HOME②)	I
9	INP9 (LS①+)	I
10	INP10 (LS①-)	I
11	INP11 (LS②+)	I
12	INP12 (LS②-)	I
13	INP13 (LS③+)	I
14	INP14 (LS③-)	I
15	INP15	I
16	INP16	I
17	+24VDC	-
18	N.C.	-
19	N.C.	-
20	OUT1	O
21	OUT2	O
22	OUT3	O
23	OUT4	O
24	OUT5	O
25	OUT6	O
26	OUT7	O
27	OUT8	O
28	+24VDC	-
29	+24VDC	-
30	+24VDC	-
31	+24VDC	-
32	COM 24VDC	-
33	COM 24VDC	-
34	COM 24VDC	-
35	COM 24VDC	-
36	COM 24VDC	-
37	N.C.	-

Outputs: type PNP 24VDC/300mA
 Inputs: type PNP 24VDC



GOYA IMAGE OF INPUTS 31....0

		IMAGE OF INPUTS 31...0																															
Bit / Input		31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

Bit	Input	Description	Connector / pin
00	INP1	DIGITAL INPUT N. 1	X1-1
01	INP2	DIGITAL INPUT N. 2	X1-2
02	INP3	DIGITAL INPUT N. 3	X1-3
03	INP4	DIGITAL INPUT N. 4	X1-4
04	INP5	DIGITAL INPUT N. 5	X1-5
05	INP6 (HOME③)	DIGITAL INPUT N. 6 (HOME INPUT: AXIS ③)	X1-6
06	INP7 (HOME①)	DIGITAL INPUT N. 7 (HOME INPUT: AXIS ①)	X1-7
07	INP8 (HOME②)	DIGITAL INPUT N. 8 (HOME INPUT: AXIS ②)	X1-8
08	INP9 (Ls①+)	DIGITAL INPUT N. 9 (FORWARD LIMIT (+): AXIS ①)	X1-9
09	INP10 (Ls①-)	DIGITAL INPUT N. 10 (REVERSE LIMIT (-): AXIS ①)	X1-10
10	INP11 (Ls②+)	DIGITAL INPUT N. 11 (FORWARD LIMIT (+): AXIS ②)	X1-11
11	INP12 (Ls②-)	DIGITAL INPUT N. 12 (REVERSE LIMIT (-): AXIS ②)	X1-12
12	INP13 (Ls③+)	DIGITAL INPUT N. 13 (FORWARD LIMIT (+): AXIS ③)	X1-13
13	INP14 (Ls③-)	DIGITAL INPUT N. 14 (REVERSE LIMIT (-): AXIS ③)	X1-14
14	INP15	DIGITAL INPUT N. 15	X1-15
15	INP16	DIGITAL INPUT N. 16	X1-16
16	Sw1	DIP SWITCH	
17	Sw2	DIP SWITCH	
18	Sw3	DIP SWITCH	
19	Sw4	DIP SWITCH	
20	FLT①	FAULT INPUT: AMPLIFIER ①	X4-2
21	FLT②	FAULT INPUT: AMPLIFIER ②	X5-2
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			

Note: To read the inputs from the CNC program, use the instructions :

G66 P0...P15

G65 P0...P15

G69 P0...P15

To see the image of the inputs, use the instruction:

%81 Q217

(see the programming manual)

APPENDIX 2 – SERIAL PROTOCOL

The serial communications have been conceived presuming that the Goya will behave as a “slave” device. This means that it will not take the initiative in any dialogue but will merely reply to interrogation and respond to instructions. The only exception to this rule is when in the emergency condition. In this event, the Goya will continue to transmit periodically the character <Ctrl-G> (07h) until the emergency is cancelled.

The Goya leaves the factory with the following configuration for the serial transmission:

BAUD RATE	9600
DATA BIT	8
PARITY	ODD
STOP BIT	1

Strings sent to the Goya must be terminated with the “Carriage Return” character (0Dh), while it is indifferent to whether the “Line Feed” character (0Ah) is added or not.

On power-up, the Goya does not return the echo of what it receives over the serial link, and in transmission it closes strings only with the “\$” prompt character, without CR or LF.

All this described here can be changed if required, using the appropriate instructions explained in the programming manual.