

**GENIUS
CONTROL**

CTRL-128

INSTRUCTIONS MANUAL

Rev.1

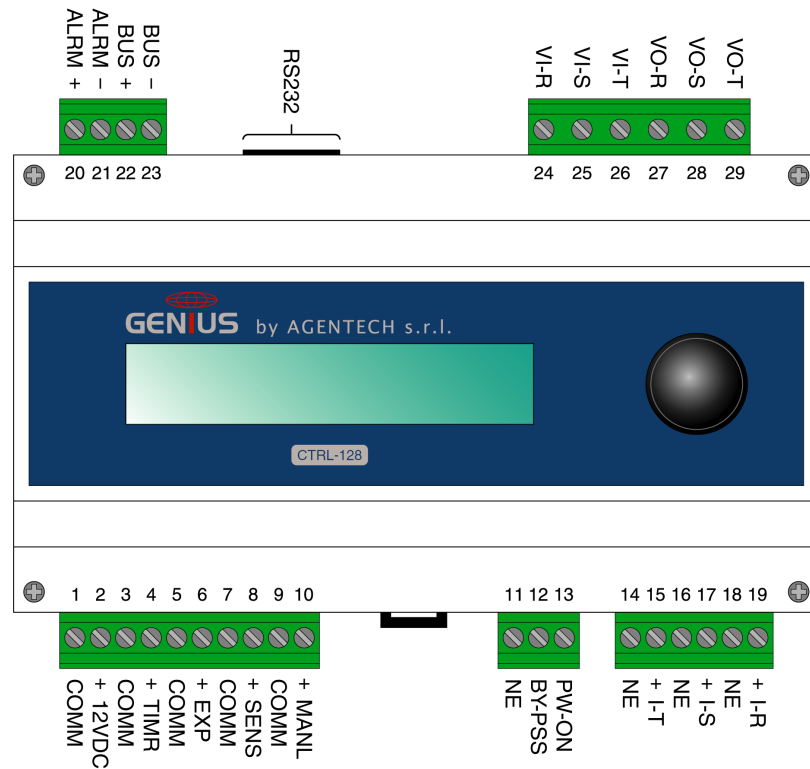
GENERAL DESCRIPTION

Genius Control CTRL-128 is a control device of the Genius range allowing the management of those regulation systems, that use the power units of the Genius Power line within single- and three-phase lighting systems. The timer mode together with one power reserve clock allow to program timing of ignition and shutoff, and also the required output tension levels. The probe Genius Sensor allows to achieve the required illuminance value according to the output tension level. The integrated measuring unit provides values of tension, current, active and reactive power, power factor and operation energy of the system; moreover it is able to gather the instantaneous and total energy saving of the system according to the operating conditions. The control of different kinds of alarm is also included. One single knob and an alphanumeric display allow to enter all the functions and to set all the operating parameters through a menu system.

TECHNICAL DATA

Feeding	12VDC \pm 10% 330mA (4W)
Inputs VI-R/S/T and VO-R/S/T	max 280Vrms
Inputs I-R/S/T with module TA3X50	max 50Arms
Outputs PW-ON and BY-PSS	230VAC 200mA
Output ALARM	30VDC 40mA
Insulation	Class I
Emission EMC	in accordance with EN61000-6-2
Immunity EMC	in accordance with EN61000-6-3
Operating temperature	from -10°C to $+45^{\circ}\text{C}$
Storage temperature	from -25°C to $+75^{\circ}\text{C}$
Humidity	up to 90% without condensation
Protection degree	IP20
Weight	500g
Clamps section	Rigid conductor 2.5mm ²
Serial interface gate	D-sub 9 poles
Dimensions (mm)	157,5 x 110 x 71

CONNECTIONS



COMM 1	2	COMMON FEEDING AND INPUTS
+12VDC	3	FEEDING INPUT 12VDC
COMM	4	COMMON FEEDING AND INPUTS
+TIMR	4	TIMER ENABLING CONTACT
COMM	5	COMMON FEEDING AND INPUTS
+EXP	6	EXPANSION INPUT
COMM	7	COMMON FEEDING AND INPUTS
+SENS	8	CONNECTION INPUT TO THE GENIUS SENSOR
COMM	9	COMMON FEEDING AND INPUTS
+MANL	10	LAMPS MANUAL IGNITION CONTACT
NE	11	NEUTRAL
BY-PASS	12	RELAY BYPASS CONTROL
PW-ON	13	RELAY ON/OFF CONTROL
NE	14	NEUTRAL
+ I-T	15	TA MODULE INPUT FOR SENSING THE T PHASE TENSION
NE	16	NEUTRAL
+ I-T	17	TA MODULE INPUT FOR SENSING THE S PHASE TENSION
NE	18	NEUTRAL
+ I-T	19	TA MODULE INPUT FOR SENSING THE R PHASE TENSION
+ALARM	20	OPTO-INSULATED OUTPUT FOR ALARM SIGNAL
-ALARM	21	OPTO-INSULATED OUTPUT FOR ALARM SIGNAL
+BUS	22	COMMUNICATION GATE TO THE GENIUS POWER
-BUS	23	COMMUNICATION GATE TO THE GENIUS POWER
VI-R	24	SENSING ACCESS TO THE INPUT TENSION R PHASE
VI-S	25	SENSING ACCESS TO THE INPUT TENSION S PHASE
VI-T	26	SENSING ACCESS TO THE INPUT TENSION T PHASE
VO-R	27	SENSING ACCESS TO THE OUTPUT TENSION R PHASE
VO-S	28	SENSING ACCESS TO THE OUTPUT TENSION S PHASE
VO-T	29	SENSING ACCESS TO THE OUTPUT TENSION T PHASE
RS232		SERIAL COMMUNICATION GATE RS232

FUNCTIONING

Timer

The Timer of the Genius Control CTRL-128 controls the different ignition and shutoff cycles of the lighting system. The timer parameter indicates if each cycle is daily either weekly controlled. By the daily procedure there are 4 cycles only, that are repeated every day of the week and are hence all the same. By the weekly procedure, you can program 4 cycles on Mondays, 4 cycles on Tuesdays, 4 cycles on Wednesdays and so on, making every day of the week different from the other. Every cycle is operative starting from the ignition time up to one second before the shutoff time. For example, if a cycle is programmed from 18:00 to 22:00, then it will be working from 18:00 up to 21:59:59.

If the ignition time is the same as the shutoff time, then it will be deactivated. In case of several contemporary cycles, priority is given to the highest number; it means that if cycle 2 goes from 18:00 to 19:00 and cycle 3 goes from 18:30 to 20:00 then cycle 2 will be working from 18:00 to 18:29:59 and cycle 3 will be working from 18:30 up to 19:59:59.

The lighting system is off when there is no cycle in operation.

By each cycle you can establish the required output tension level in Volts either, in combination with the luminosity probe Genius Sensor, you can assign the required illuminance value in lux at each cycle. The luminosity sensor Genius Sensor has to be positioned in order to sense the luminous intensity of the environment and not that of the lighting system. The nominal lighting parameter indicates the luminance in lux provided by the sole lighting system at a 230V nominal tension without any further luminous sources. Genius Control CTRL-128 establishes the tension to be applied to the lighting system according to the nominal lighting, to the lighting of the environment sensed by the probe, and to the illuminance value required at each cycle. During the operation, when the lighting system is on, variations of the output tension -- due to changes of the cycle or to the different results from the measurement of the illuminance data -- may gradually occur, by following a ramp, whose slope is given by the variation slope parameter.

When switching on the system, Genius Control CTRL-128 applies an ignition cycle by setting up the output tension on the value of the ignition tension parameter together with the time based on the ignition time parameter, in order to allow the pre-heating of the lamps. The operation of the timer is established by the input status + TIMR. In order to enable the timer, the input + TIMR needs to be connected to the common COMM; an example of that is the connection of the clean contact of a crepuscular switch that deactivates the timer, in order to prevent the ignition of the lighting system when there is enough sunlight, even though cycles are still in operation.

Manual Input

Genius Control CTRL-128 is provided with the manual mode, enabled through the connection of the input +MANL to the common COMM, that allows to set up the output tension anytime on the fixed value of 220V, not depending on the timer programming.

ON and BYPASS outputs

Genius Control CTRL-128 is provided with the PW-ON and BYPASS outputs implemented by static network tension relay, that connects them to the neutral NE.

The output PW-ON is enabled when the lighting system needs to be on and is provided for the connection of a relay or a contactor, that feeds the power units when the system has to be on and that stops feeding the power units when the system has to be off.

The BY PASS output is enabled when at one or more cycles there is feeding tension in the input and the timer has already started the ignition of the lighting system, but the output tension is too low and indicates the bad functioning or the intervention of the protection devices of the power units.

The BY PASS output is equipped for the connection of a relay or a contactor, connecting the output to the input and preventing the shutoff of the system. Once the bypass condition and the related output are enabled, they remain active until the next shutoff.

Measurements

The measuring unit of the Genius Control CTRL-128 measures the effective value of tension, currents and active power at each cycle and is able to calculate the apparent power, the power factor and the active power. Moreover it calculates the total active power and the saved active power and gathers energy meters and meters for saved energy.

Calibration of energy efficiency

Genius Control CTRL-128 establishes the estimated power consumption of the lighting system according to the feeding tension of the system itself. The estimate is calculated according to the data collected from the calibration of efficient energy that, step by step, feeds the lighting system with different output tension values and reveals the related active power consumption. The calibration of efficient energy makes a further check at the end of the cycle, by feeding the system at a fixed output tension value, by calculating the estimate active power consumption starting from the collected data and by verifying that it matches with the active power actually measured. The output tensions, feeding the system during the efficient energy calibration process, range between the parameters of minimum and maximum limit of the output tension.

Calculation of energy efficiency

Genius Control CTRL-128 allows to calculate the active power consumption and the gathered energy efficiency, that represent the instantaneous and total energy saving of the system, achieved through the regulation device when directly connected to the electric network. The active power consumption is equal to the difference between the active power – that the system would absorb if it was fed directly at the input tension -- and the active power actually absorbed by the lighting system itself, fed at the regulated output tension. The active power, that would be absorbed by the lighting system in case it was fed directly at the input tension, is calculated according to the data collected during the energy efficiency calibration process.

Alarms

Genius Control CTRL-128 operates several alarms conditions in order to indicate bad functioning of the regulation device and of the lighting system. At each cycle the following alarm records can be individually enabled or deactivated: absent input tension, absent output tension, open loading and abnormal loading. Conditions of absent input and output are due to a low input- and output tension, conditions of open loading are due to a low active power consumption, conditions of abnormal loading are due to an active power consumption that is different from the expected one. The expected active power is the power that should be absorbed by the lighting system when it is fed at the output tension and is calculated according to the data collected during the energy efficiency calibration process. The reporting of abnormal loading can be used to indicate the bad functioning of the lamps or the selection of parts of the system for the intervention of automatic switches. The reporting of alarm in bypass condition can also be enabled or deactivated. The alarm condition is indicated by the opto-insulated \pm ALARM output.

CONFIGURATION

Home Page

By the ignition the Genius Control CTRL-128 displays for a few seconds the home page indicating the version of the installed software. (V.01.00).

```
Genius Ctrl-128 V.01.00
-----
```

Main Page

The main page is displayed when the menu is not active. On the main page the day, the current date and time, the operative time cycle, any bypass or alarm condition and the output status are displayed.

```
Dom 01/06/08    12:25:05
F-              Spento
```

When the power reserve of the internal clock is over, due to a continuous absence of feeding, the current time is no longer displayed (--- --/--/-- --:--:--) and the clock functions are deactivated. In order to restore the regular functioning, the clock regulation procedure needs to be applied. The indicator of the time cycle displays the number of the current time cycle (ex. F2) either indicates that no time cycle is operative (F-). The manual mode is also indicated (Man) together with any bypass (BYP) and alarm condition (ALL). The displaying of the output status indicates the output tension (ex. 205V) or the state of rest (OFF).

Main Menu

By pressing the knob you can enter from the main page to the main menu, allowing the access to the functions of the Genius Control CTRL-128. By turning the knob all the functions of the menu are displayed, by pushing it the selected function can be entered. When there are changeable values, such values can be modified by pushing the knob; the item being modified is highlighted and can be actually changed by turning the knob. By pushing it again the modified item is confirmed and in case of further variable values you can access the following one. The change process ends when there are no more values highlighted. The last entry (BACK) allows to go back to the main menu or to the home page.

Measurements displaying

This function allows the access to the measurements displaying pages including: lighting (lx), input tension (Vrms), output tension (Vrms), current (Arms), active power (W), apparent power (VA), power factor, reactive power (VAr), total active power (W), saved power (W) energy (kWh), saved energy (kWh). The illuminance value can be displayed only when the probe Genius Sensor is connected.

Lamp Test

This function allows a quick control of the functioning of the regulation system by setting up the output tension on a specific value.

```
Uscita
210 V
```

In order to enable the specific output tension value you need to press the knob and access the change of the parameter. As long as the parameter is changed, its value will be immediately applied to the output, without considering the minimum and maximum limits parameters of the output tension. When the change is over, the system will be back to the regular management of the time cycles.

Timer programming

This function allows to program the time cycles. In order to program the timer in a weekly mode, you need to turn the knob and select the week and the timing that have to be modified.

```
Mar 00:00 → 00:00
F3  Uscita      205 V
```

By pressing the knob you can apply the change of the starting time, of the minutes in the starting time, of the finishing time, of the minutes in the finishing time, of the output or lighting mode and of the illuminance or tension value.

The daily mode of the timer is the same, except that the day of the week cannot be selected.

```
** 00:00 → 00:00
F1  Uscita      205 V
```

Clock regulation

This function allows the setting of the internal clock.

```
Mar 01/01/08 08:00:00
OK
```

By pressing the knob day of the week, day, month, year, hours, minutes and seconds are automatically established. By selecting the OK box, the knob has to be pushed by the time-signal in order to achieve an accurate setting. The set up of the internal clock occurs in the moment the knob is pushed and the OK box is active. By a second thought, if the knob is turned anticlockwise the expression on the box becomes ANN and by pressing the knob you can reset the operation.

Parameters Setting

This function allows the set up of the operation parameters of the Genius Control CTRL-128.

```
Contrasto Display 40 %
```

The display contrast increases as soon as the parameter increases. The pre-established 40% value is suitable to most cases, it can be reduced in case of high temperatures, that make the display darker, and can be increased in case of low temperatures making the display brighter.

```
Modo Timer
Settimanale
```

The timer manages 4 cycles in a daily mode either 4 cycles for each day of the week in a weekly mode.

```
Accensione
                210 V  10 m
```

The ignition parameters indicate the output tension value and the time required for the pre-heating of the lamps of the lighting system.

```
Limiti Uscita
Min:180 V  Max:230 V
```

The minimum and maximum limits are never overcome in the output tension calculation. The minimum limit has to be set up in order not to switch the lamps off and the maximum limit can be reduced in order to achieve a greater efficiency.

```
Illuminamento Nominale
                300 lx
```

The value of the nominal illuminance is included onto the calculation of the output tension, when we apply the lighting mode for programming the cycles, and it is equal to the luminance in lux provided by the sole lighting system to the nominal 230V tension.

```
Pendenza Variazione
                5 s/V
```

The variation slope value indicates the slope of the ramp where the output tension changes from one value to another one.

Alarm management

This function allows the access to the pages enabling (Att.) or deactivating (Des.) the alarm reports due to absent input tension, absent output tension, open loading, abnormal loading, bypass.

Calibration of energy efficiency

This function allows to apply the procedure for the step-by-step reporting of the active power consumption of the lighting system, fed with different output tension values.

The page of the starting of the calibration process is firstly displayed

```
Calibrazione Risparmio
Avvio                OK
```

By pressing the knob the OK box is highlighted, the procedure is started the moment the knob is pressed and the OK box is active. By a second thought, if the knob is turned anticlockwise the expression on the box becomes ANN and by pressing the knob you can reset the operation. During the calibration process the page indicating the following values is displayed: the estimated time left (for ex. - 1:04:35), the cycles where the procedure is operative (for ex. RST), if data are being measured (Measuring) or their validity is being checked (Verifying), and the output tension (for ex. 205V).

```
Calibrazione      -1:04:35
RST               Misura  205 V
```


The estimated time left prior to the end of the cycle is a maximum value, the displayed value can change during the procedure depending on the operative conditions, that make the effective time shorter. By turning the knob you can access the page of stop procedure.

```
Calibrazione Risparmio
Interruzione          OK
```

By pressing the knob the OK box is highlighted, the procedure is stopped the moment the knob is pressed and the OK box is active. By a second thought, if the knob is turned anticlockwise the expression on the box becomes ANN and by pressing the knob you can go back to the calibration page. At the end of the procedure, the page of the calibration ending is displayed in case of success.

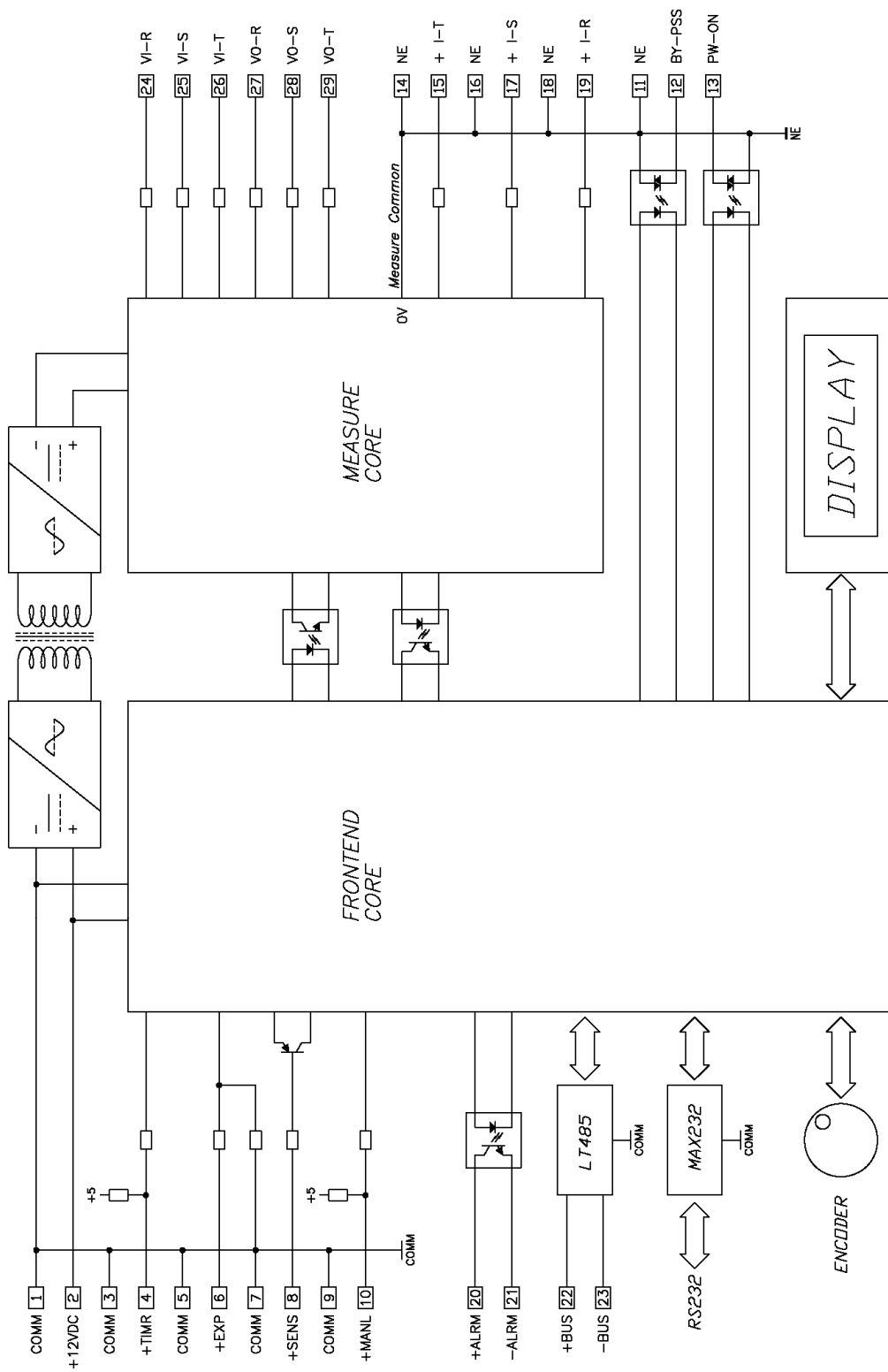
```
Calibrazione Terminata
***** OK *****
```

If an error occurs during the calibration process, the page indicating the reason of the error is displayed.

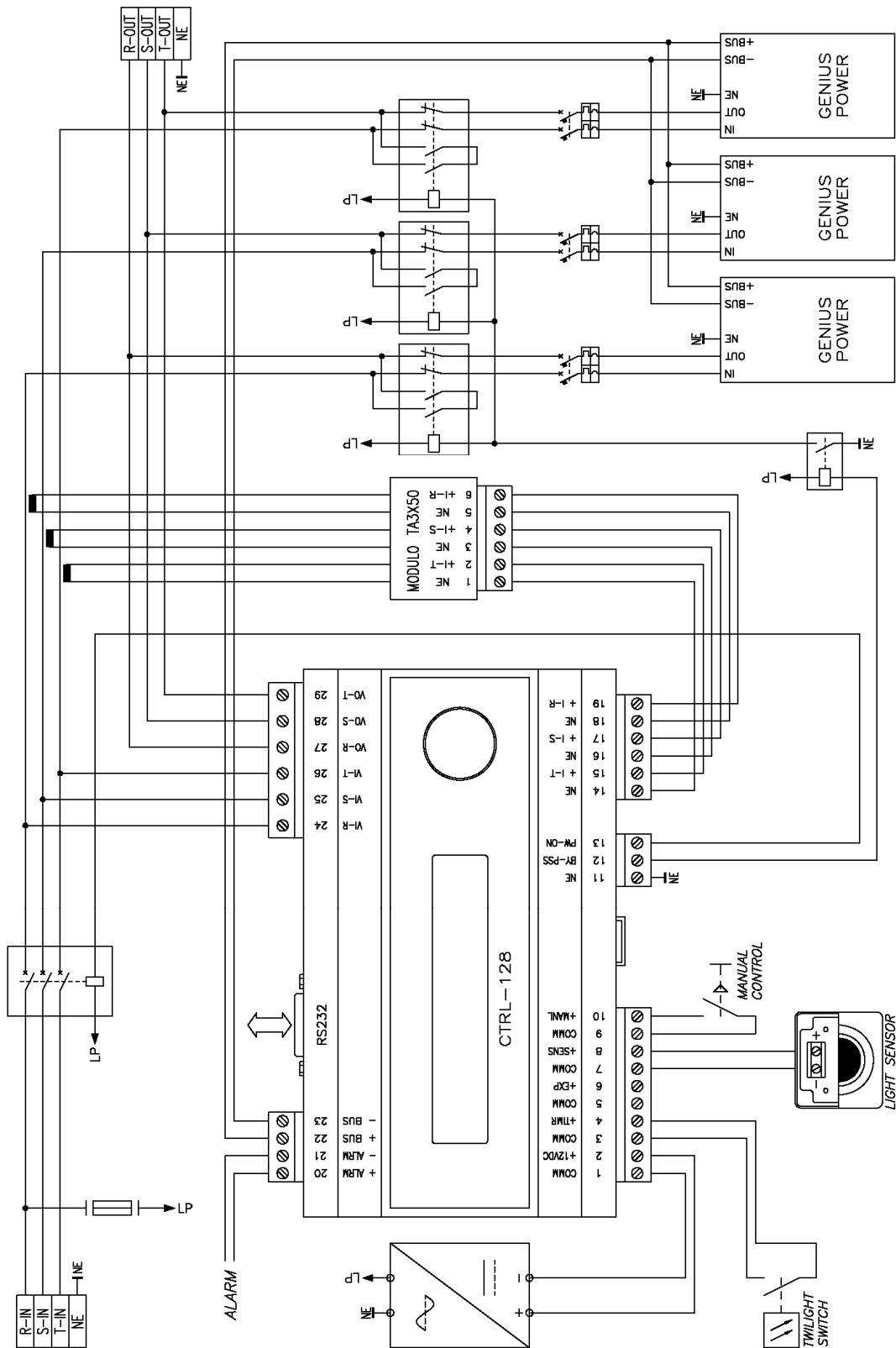
```
Calibrazione ERRORE
Ingressi Assenti
```

The reasons for such error might be: ABSENT INPUT if the input tension is too low, ABSENT OUTPUT if the output tension is too low, OPEN LOADING if the absorbed power is too low, OUTPUT NOT ACHIEVED if the output tension is too different from the value required by the procedure, OUTPUT MODE, if the measured output tension value is not increasing as per the values required by the procedure, POWER MODE, if the measured power consumption is not increasing as per the values required by the procedure, VALUES VERIFYING, if the value of the power consumption - calculated according to the data collected during the procedure - do not match the values actually measured, ABSENT INPUTS if by the starting of the procedure there is not enough input tension at each cycle, COMMUNICATION or UNKNOWN in case an internal communication error occur with the measuring system, STOPPED when the procedure is stopped. The error in the output mode might be caused by a variation of the input tension value, the errors of power mode and value verifying occur when the conditions of the system change depending on lamps faults, on removal either insertion of parts for the intervention of sectioning switches during the calibration process.

BLOCK DIAGRAM



TYPICAL APPLICATION



DIMENSION

