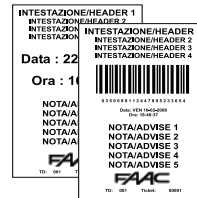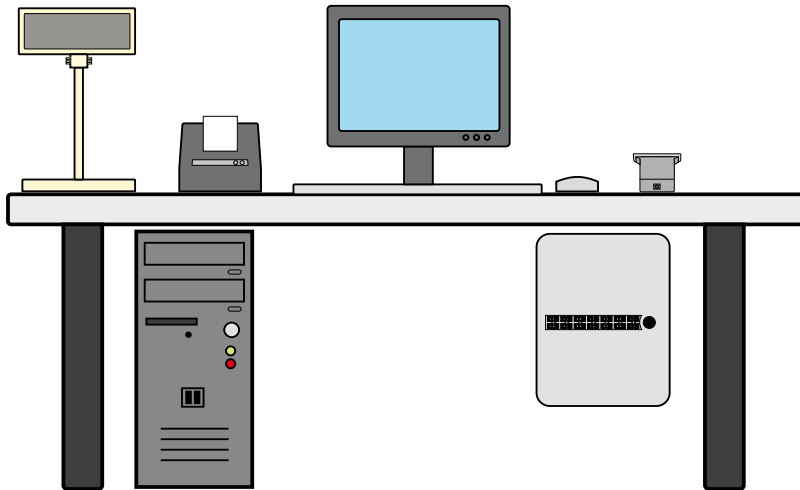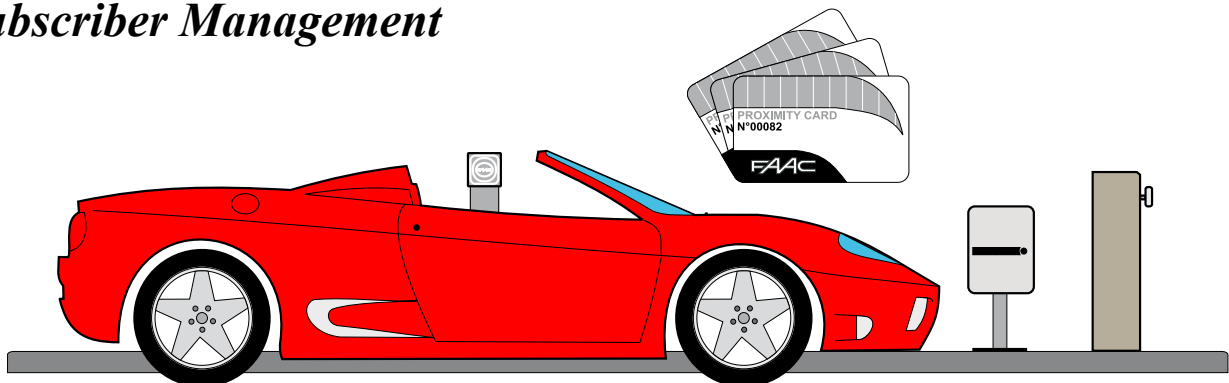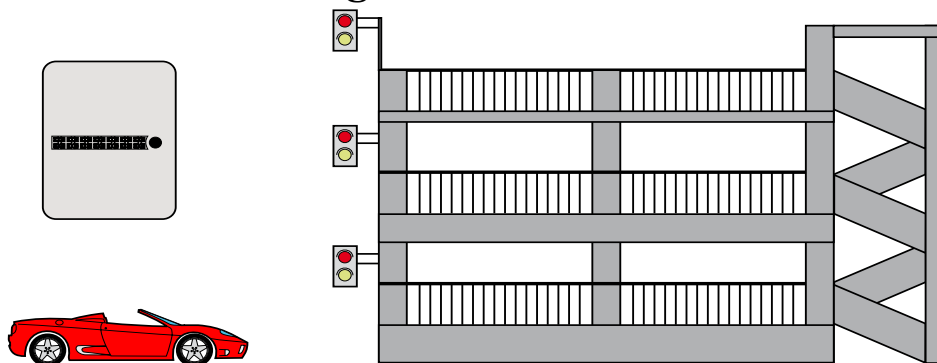# PL Controller
ParkLite

Cash Desk Management
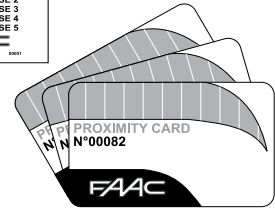
Subscriber Management

Vehicle Presence Management

INSTALLATION MANUAL

FAAC

PL Controller rev. A

CE DECLARATION OF CONFORMITY

Manufacturer: FAAC S.p.A.

Address: Via Benini, 1
             40069 - Zola Predosa
             BOLOGNA - ITALY

Declares that: the ParkLite PL Controller

•conforms to the essential safety requirements of the following EEC directives:

73/23/EEC and subsequent amendment 93/68/EEC
89/336/EEC and subsequent amendment 92/31/EEC and 93/68/EEC

•and also conforms to the following standards:

EN 50081 -1   EN 60555 - 2   IEC 801 - 2
EN 50082 -1   EN 60555 - 3   IEC 801 - 3
EN 60335 -1   EN 55022   IEC 801 - 4
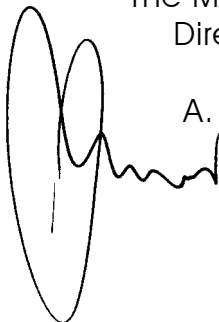EN 60204 -1   EN 55014

Additional notes:
        this product underwent a test in a typical, uniform configuration (all products manufactured by FAAC S.p.A.).

Bologna, 01 January 2006

The Managing
Director

A. Bassi

WARNINGS FOR THE INSTALLER

GENERAL SAFETY OBLIGATIONS

1) **IMPORTANT! To ensure the safety of people, it is important that all the instructions be carefully read. Incorrect installation or incorrect use of the product could cause serious harm to people.**

2) <u>Carefully read the instructions</u> before beginning to install the product.

3) Packing materials (plastic, polystyrene, etc.) must not be left within the reach of children, because these materials are potential danger sources.

4) Keep the instructions for future reference.

5) This product was designed and built exclusively for the use indicated in this documentation. Any other use not expressly indicated could compromise the condition of the product and/or be a source of danger.

6) FAAC declines any responsibility due to improper use or use other than the use for which the product is intended.

7) Do not install the equipment in an explosive atmosphere. the presence of gas or inflammable fumes is a serious danger to safety.

8) FAAC is not responsible for failure to use Good Workmanship in installing the product.

9) The installation must be carried out by observing standards EN 12453 and EN 12445.

10) Before attempting any action on the system, cut out the electrical power supply.

11) Install an omnipolar switch upstream of the power supply line for the ParkLite PL Controller with contact opening distance of 3 mm or more. We advise you to use a 6A thermal breaker with omnipolar switching.

12) Make sure that a differential switch with a threshold of 0.03A is installed upstream of the system.

13) Make sure that the earthing system is expertly made and connect to it the Yellow/Green earth terminal of the PL Controller.

14) FAAC declines all responsibility for the safety and efficient operation of the PL Controller, if system components not produced by FAAC are used.

15) For maintenance, strictly use original FAAC parts.

16) Do not in any way modify the components of the ParkLite PL Controller.

17) The installer must supply all information on the operation of the system and hand over to the user, the "User's Guide" which accompanies the product.

18) The user must not in any way attempt to repair or to take direct action and must contact qualified personnel only.

19) **Anything not expressly specified in these instructions is not permitted.**

Contents

1. DESCRIPTION AND TECHNICAL SPECIFICATIONS

1.1 DESCRIPTION

The PL Controller consists of a multi-functional electronic unit, which makes it possible to control various options of the ParkLite parking system.
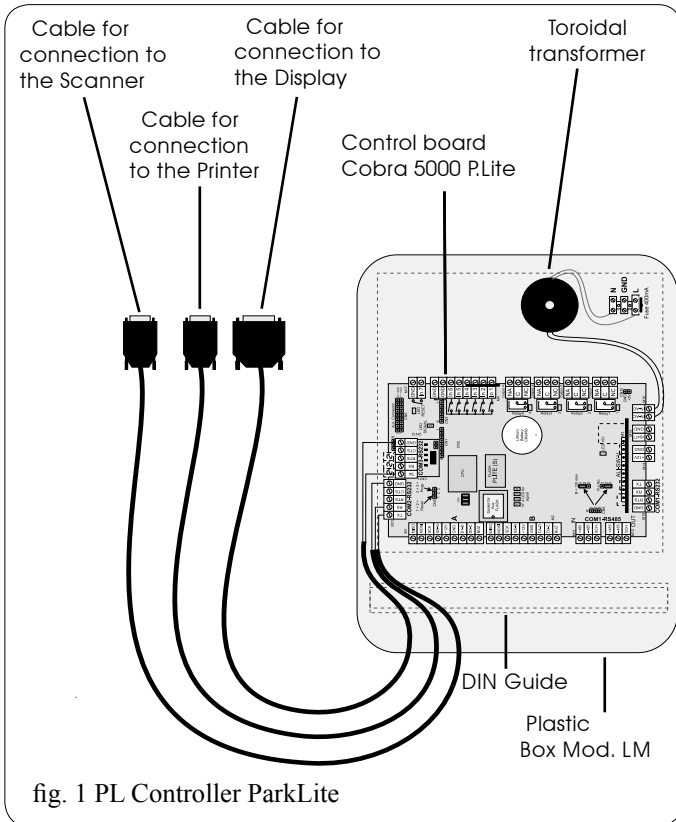

fig. 1 PL Controller ParkLite

We shall sum up the performance provided by this equipment:
- Management of a decentralised Cash Desk station
- Management of an on-lane Cash Desk station
- Control of an entry/exit lane for subscribers
- Vehicle count (COUNTER/DOOR)

We must underline that the characteristics mentioned can be configured individually. Therefore, a single unit cannot be used to simultaneously perform two or more of the options mentioned.

All functions are managed from the electronic control unit, subordinately with respect to the ParkLite software, installed on a personal computer. This type of connection makes it possible to exploit all the services offered by the system, thanks to the support of the parking area management program.

The units controlling the decentralised cash desk station, the on-lane cash desk station, vehicle counting, are in operation only when they are on-line with the ParkLite software.

The independent management, i.e. without the support of the ParkLite program and of the connection to a data Controller PC, was implemented strictly for the lane control option in the entry/exit management for subscriber users.

This characteristic was included in the appliance's firmware, in order to manage the entry/exit of subscriber users in a parking area, controlled by a single Master unit, which can be a PL Master Controller or a Master Ticket Dispenser (equipped with a card reader). All the other Slave equipment are connected to this Masters via an RS 485 data transmission network. In this case, all the system's units, whether Master or Slave must be configured and controlled from the "PL programming Keyboard".

For obvious reasons, independent parking systems, i.e. without a management program, have performance items that are limited compared to those subordinated to a PC data Controller via the ParkLite software.

The Cobra 5000 P.Lite electronic control board, installed inside the plastic box, has a series of input/output connectors, whose function depends on the type of operational mode selected.

The function for which the unit was designed is acquired, and is then applied by the device at every start, by controlling the position of a jumper, installed in the CN1 connector:

fig. 2

Setting of function Jumper

Jumper CN1	Function
B	CASH DESK
C	SUBSCRIBERS
D	COUNTER/DOOR

NB: position A and E sets the board respectively as a Ticket Dispenser/Ticket Reader. Consult the respective manuals.
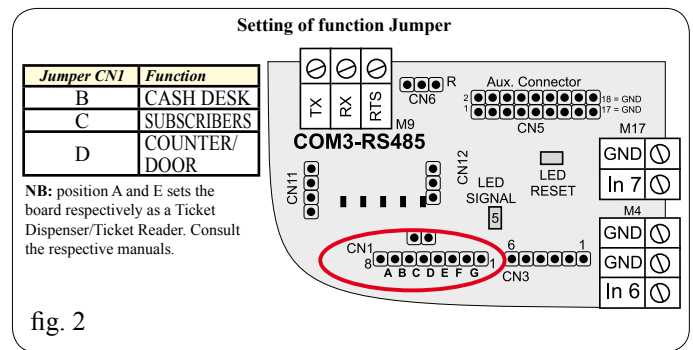
IMPORTANT: the equipment is always supplied set as a Cash-desk, i.e. with the jumper fitted in position B. To vary the function, always power down the unit, before changing the position of the above jumper.

Connection with two magnetic loops, able to detect the presence and transit direction of the vehicle, is obligatory for all models configured for managing a vehicle lane. The engagement and disengagement of these sensors, allows the Cobra 5000 P.Lite to enable the ticket/card reading modules, control the car's travelling direction, supply the opening/closing command to the beam, and do the counting. The location of the loops, in common with that of the equipment for controlling transit, must observe to the letter the instructions in the following chapters.

As explained above, where the unit is designated to open/close a vehicular gate, barriers which manage the parking logic must always be used.

The vehicles-only lanes must be provided with appropriate horizontal and vertical signs indicating "transit by pedestrians forbidden". Likewise, if there are any pedestrian crossings on the lanes, all the beams must be made safe and suitable warning signs must be installed. See the current legal regulations on the matter (in particular standards: EN12453 and EN 12455).

To avoid damage to transiting vehicles, the barriers must be equipped with a safety option, which makes it possible to connect the "vehicle present" signal, received from the transit loop, to avoid accidental closure. This characteristic must be enabled also when photocells installed under the beam are used.

1.2 TECHNICAL SPECIFICATIONS

Tab. 1 Characteristics of the PL ParkLite Controller

DIMENSIONS	240x350x140 (Width x Height x Depth in mm)
WEIGHT	3,5 Kg
ENCLOSURE	Plastic box (ABS) mod. LM
POWER SUPPLY	230 Vac (+6% - 10%) 50 Hz
OPERATING AMBIENT TEMPERATURE	-10°C / +50°C
ABSORBED POWER	16 Watt
INPUT/OUTPUT CONNECTIONS	Via extractable terminal-boards, on control board
METAL DETECTOR FOR LOOPS CONNECTION	Not supplied
POWER FEEDER	Toroidal 230Vac (primary) 18Vac (secondary) 20 VA
DATA TRANSMISSION LINE	RS485
CONTROL UNIT	COBRA 5000 P.Lite board
RAM CONTROL UNIT	512 KByte
USER CAPACITY	5000
EVENT CAPACITY	15000
SERIAL PORTS	3 denominated: COM1, COM2, COM3.
INPUTS	6 + 1 defined as: : In1, In2, In3, In4, In5, In6, In7.
OUTPUTS	4 on relay and 1 open collector, defined as: Out1, Out2, Out3, Out4, Out5-
READER CONNECTIONS	2 inputs
CABLES SUPPLIED STANDARD	1 for cash-desk scanner,1 for cash-desk printer, and 1 for cash-desk display
CLOCK AND DATER	Internal RTC module with lithium buffer battery
DATA MAINTENANCE	In the event of a power cut, by an internal lithium battery mod. CR2450

IMPORTANT NOTE: as we said, the function of the inputs and outputs on the Cobra 5000 P.Lite control board, varies according to the type of operating mode selected. It should also be considered that also the availability of the inputs/outputs depends on the selected operational criterion. For this reason, you should examine the characteristics of the specific functions, described in the paragraphs in the following pages.

Tab. 2 Specifications of passive card readers, managed by the PL Controller

TYPE OF CARD READER	Contact Less reader of Passive Transponders
CARD DETECTION FREQUENCY	125 KHz
TYPE OF READ CARDS CODING	UNIQUE
CARD DETECTION DISTANCE	Max. 10cm.
CARD FORMAT	ISO (86x54x0,78mm) or key-case format

Tab. 3 Specifications of magnetic card readers, managed by the PL Controller

TYPE OF CARD READER	Magnetic card swipe reader (100% of track)
TYPE OF READ CARDS CODING	Standard 2 ISO track (from 1 to 37 characters)
CODING CODE	High coercitivity 4000 Oe
CARD FORMAT	ISO (86x54x0,78mm)

2. DECENTRALISED CASH DESK INSTALLATION

2.1 STATION SPECIFICATIONS

All the components of the decentralised cash-desk station of a ParkLite automated parking system, are directly managed by the PL Controller.

Equipment of the decentralised cash-desk of the parking area:

Nr. 01 PL Controller
Nr. 01 Personal Computer
Nr. 01 PC Monitor
Nr. 01 PC keyboard
Nr. 01 PC Mouse
Nr. 01 Optical Scanner
Nr. 01 Receipts printer
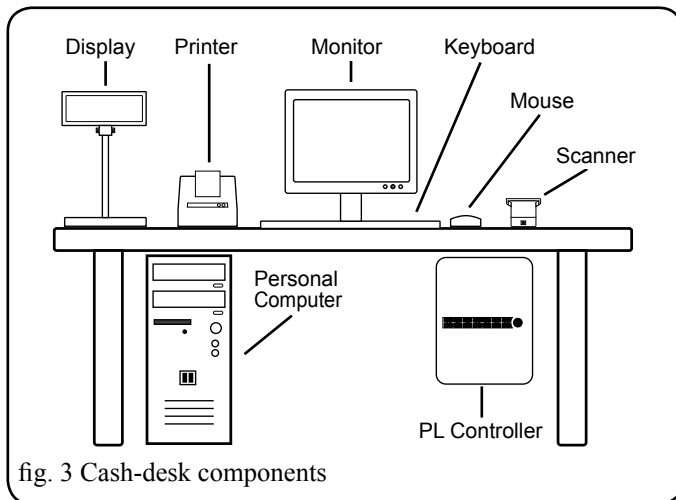**Nr. 01 User display**

fig. 3 Cash-desk components

For this type of use, the devices described above must be exclusively connected in the appropriate way, because the unit is not constrained to manage any lane equipment, such as: magnetic loops, barrier opening/closing commands, A/F panel etc.

2.2 ESSENTIAL REQUIREMENTS

• The personal computer must use one of the following operating systems: Windows NT, Windows 2000, Windows XP.
• The personal computer must have a free serial port (preferably on the mother board).
• The resolution of the computer monitor must be 1024x768 pixel.
• The computer must have a RAM of at least 256 MB.
• The computer must have at least 2 GB of free memory on the Hard Disk.
• The computer must have a CD reader.

• In the decentralised cash-desk station, at least 7 power sockets for 230Vac/50Hz (8 if the intercom control unit is installed) shall be available to power the devices.
• The power cables and the cables for connecting the equipment in the parking system must have the characteristics indicated in paragraph:
3.2 Type of cables.
• Furthermore, all the instructions in paragraph "General safety rules" on page 3 must be respected, and, with reference to the specific electrical preparations, as described in paragraph:
3.1 Safety instructions.
• Appropriate signs (not supplied by FAAC), indicating the tariffs and the car park rules must be visibly shown on the entrance lane to the car park.

NB.: All the equipment which can be used in the ParkLite parking system, were designed and tested by FAAC, in observance of the points mentioned above. In order to avoid any kind of unforeseen behaviour, all the rules shown in this manual must be observed.

2.3 POSITION OF EQUIPMENT

Remember that the cables supplied standard with the PL Controller - for connection of the optical scanner, receipts printer, user display - each measure 2 metres. For this reason, the unit must be secured so that this equipment can be correctly positioned and used without any difficulty.
This criterion should be applied also for locating the other station devices, so that the cash-desk operator can do his work smoothly.

3. ELECTRICAL PREPARATION FOR DECENTRALISED CASH DESK

3.1 SAFETY INSTRUCTIONS

• Before attempting any action on the system, cut out the electrical power supply.

• Install an omnipolar switch upstream of the power supply line for the devices, with contact opening distance of 3 mm. or more. We advise you to use a 6A thermal breaker with omnipolar switching.

• Make sure that a differential switch with a threshold of 0.03A is installed upstream of the system.

• Make sure that the earthing system is expertly made and connect to it the metal parts.

• Apply all the instructions described in the preceding points to all the lane devices, in addition to the decentralised cash desk.

3.2 TYPES OF CABLES

The characteristics of the cables, to be used for connecting the PL Controller, are determined to ensure that the equipment and all the devices connected to it operate well.

However, remember that many of these are already supplied

standard for the equipment. For this reason, the lay-out below only shows the peculiarities of the conductors, which must be used in the other connections:

Elettrical preparations for Decentralised Cash Desk ParkLite

1		Flame-retardant cable 2 x 1,5 mm² + earth (power supply for devices)
2		Cable Belden 9841 or CEAM Y09842 with twisted pairs and screened for transmission on data network with RS 485 protocol. All devices must be multidrop-connected as shown in lay-out "Data Line Connections"
3		Shielded cable for intercom 2 x 1,5 mm² (if Legacy model). Telephone pair 0,4 mm² - 275 Ohm/Km Line (Double wire), or telephone pair 0,6 mm² 122 - Ohm/Km Line (Double wire) (if Deluxe model)

* Connection to the intercom control unit is not executed inside the PL Controller

Fig. 4

4. ELECTRICAL CONNECTIONS FOR DECENTRALISED CASH DESK

4.1 CONNECTIONS ON BOARD

Most of the devices managed by the PL Controller are connected via the Cobra P.Lite board.

The lay-out below shows all the connections that can be made, with the equipment configured as a Decentralised Cash-desk:

Equipment connection lay-out for ParkLite Decentralised Cash-desk

Fig. 5

4.2 DATA TRANSMISSION LINES

The PL Controller must be connected to a data transmission line, so that all the necessary information can be transmitted/received, in a specific management unit, to which the equipment will be slaved. In the higher performance systems, all the devices which control entrance/exit to/from the parking area, are controlled by a Personal Computer (data controller) by means of the ParkLite software. The lay-out in the following figure shows the connection of the various types of equipment which can be connected to the data transmission line. In addition to this, a table summarises the characteristics required for operation of the data communication networks.

Connection of data lines in a system operating on-line with controller PC and ParkLite management software

Network connection between Concentrator PC and NET PC

• The concentrator PC must share the program's (ParkLite) work directory with all the NET computers for access, reading and writing.
• If the system uses NET stations, both the concentrator PC and the NET PC must have a static address assigned to them.
• The fundamental parameters for network connection between PCs. such as: IP address, Netmask, Gateway, etc, must be supplied by the customer's network administrator.

RS 485 Data transmission line

• Use a paired, twisted and screened cable for transmission on data network with RS 485 protocol, type Belden 9841 or CEAM Y09842 or with identical characteristics.
• All devices must be multidrop-connected as shown in lay-out.
• A maximum of 31 devices can be connected for every line output from the converter.
• The total maximum distance of the network must not exceed 1200 mt.
• Insert a 120 Ohm termination resistor (insert by shifting a jumper on the Cobra control unit or on the converter) at the end of the line.
• Star-type connections are not permitted.
• Do not make any joints on the data transmission cable.

Fig. 6

4.3 INTERCOM CONNECTION

The intercom is an optional item and can be supplied in two different models, named:

• **LEGACY**

• **DELUXE**

Connection to the intercom control unit depends on the model used. To this end, consult the manual of the intercom that was bought.

5. DECENTRALISED CASH DESK MANAGEMENT UNIT

5.1 P.LITE COBRA BOARD

The PL Controller electronic control unit is defined as: **Cobra P.Lite**. It has specifically created firmware for commanding all devices which need to be controlled in the cash-desk station.

The board manages some processes in a fully independent way, whereas others can be subordinated through the board to the ParkLite management software.

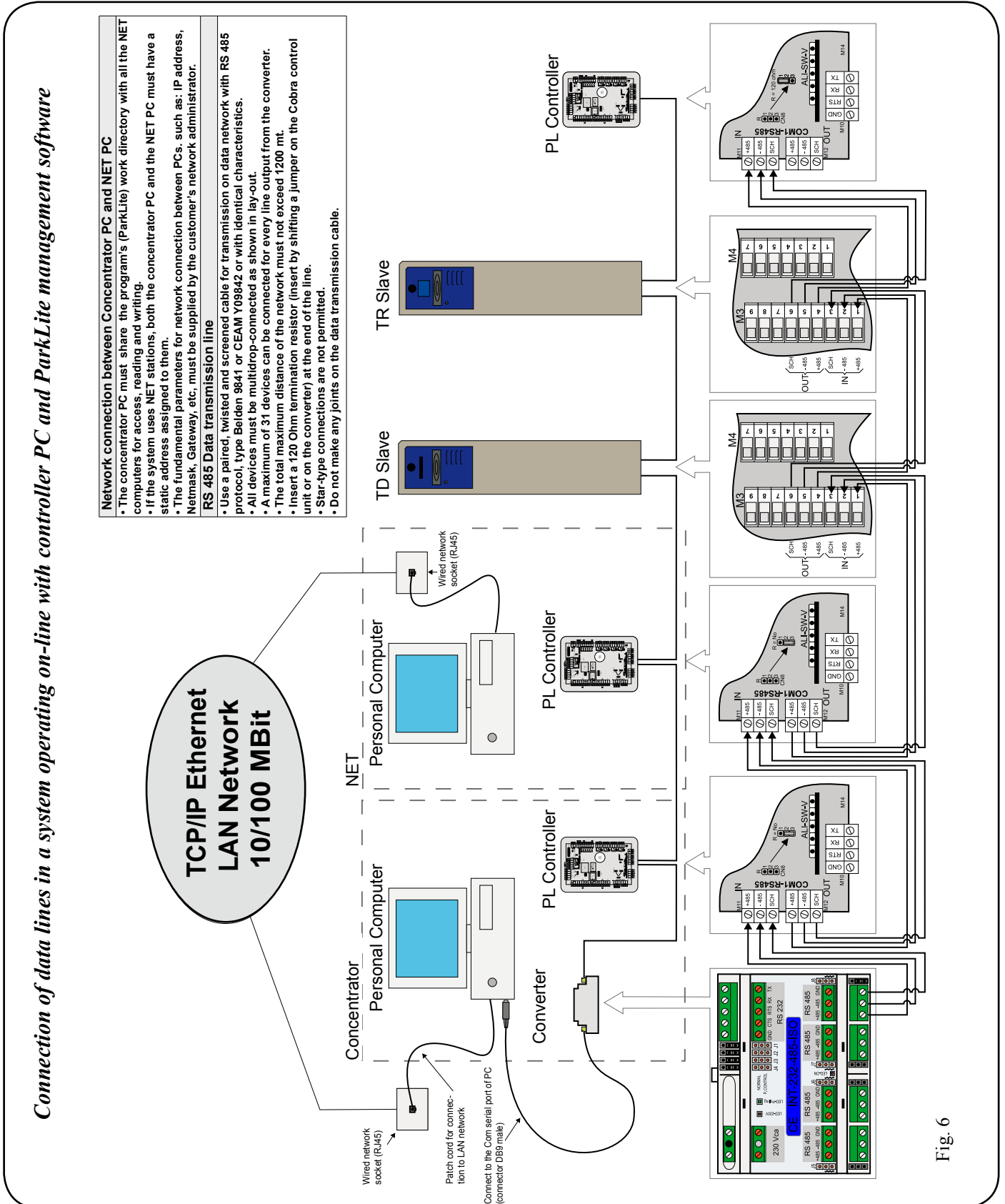We must underscore the fact that every equipment for treating tickets and cards in the ParkLite system uses this type of unit. The various devices of the system (Ticket Dispenser, Ticket Reader, Cash Desk, etc) make use of this control board with the same firmware. The function to which the equipment is addressed, is acquired by inserting a jumper, located on the board's CN1 connector.

5.2 JUMPER FUNCTION

Whenever the PL Controller is powered up, the Cobra P.Lite control unit controls the function to which it is delegated, through the jumper fitted on the CN1 connector, and it sets itself to manage all the specified devices for that use. Therefore this jumper must be correctly fitted.

The PL Controller is supplied with the jumper already set as "Cash-desk": fig. 7 shows all the settings which can be carried out on the management unit. This figure is included in order to be used, if this board has to be replaced on the equipment. The Decentralised Cash-desk/On-lane Cash-desk option can be selected and set, exclusively with the ParkLite software

5.3 RS485 LINE TERMINATION

On the Cobra P.Lite board, there is a connector which makes it possible to fit a 120 Ohm termination resistor on the RS485 data transmission line.

We should stress that this resistor must be used only if the equipment is located on one of the ends of the line section. The CN8 connector is used for this purpose.

Figure 7 shows the insertion of this characteristic.

Set-up of function jumper and insertion of termination resistor

Set-up of function Jumper

Position of Jumper in CN1	Description of function
A	TICKET DISPENSER
B	CASH-DESK (ON-LANE OR DECENTRALISED)
C	SUBSCRIPTION (VEHICULAR)
D	COUNTER/DOOR
E	**TICKET READER**

NB: make sure that the jumper is correctly positioned.

Termination resistor on RS485 network

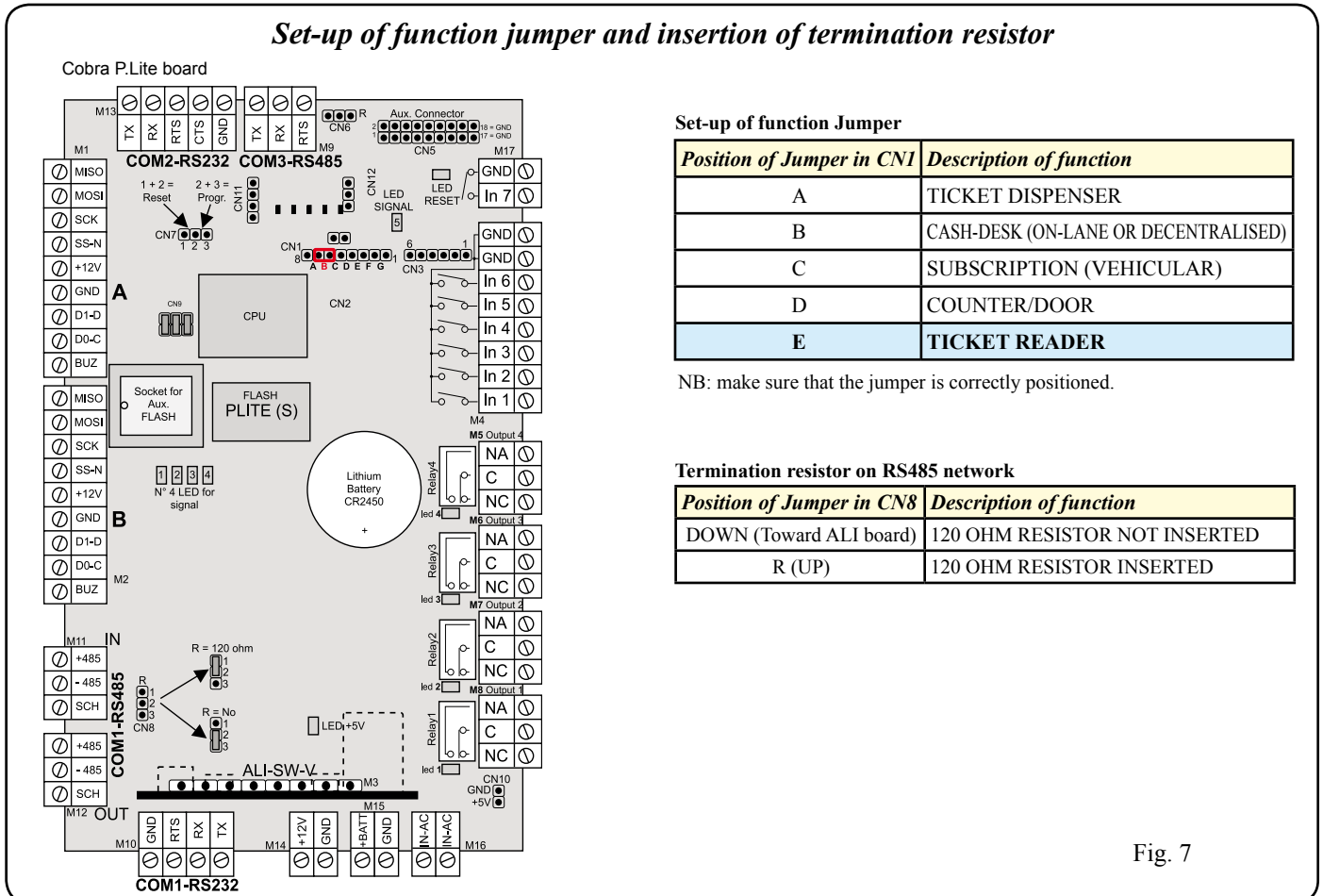| Position of Jumper in CN8	Description of function
DOWN (Toward ALI board)	120 OHM RESISTOR NOT INSERTED
R (UP)	120 OHM RESISTOR INSERTED

Fig. 7

6. ON-LANE CASH DESK INSTALLATION

6.1 STATION SPECIFICATIONS

All the components of the on-lane cash-desk station of a ParkLite automated parking system, are directly managed by the PL Controller.

Equipment of the on-lane cash-desk of the parking area:

Nr. 01 PL Controller
Nr. 01 PL Terminal-board
Nr. 01 Personal Computer
Nr. 01 PC Monitor
Nr. 01 PC Keyboard
Nr. 01 PC Mouse
Nr. 01 Optical scanner
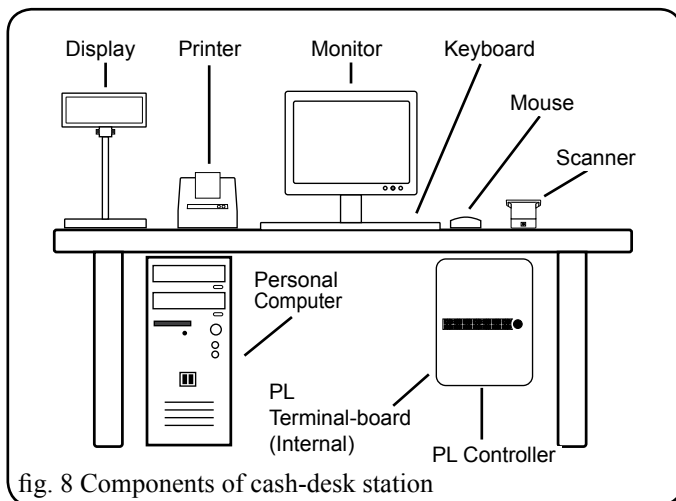**Nr. 01 Receipts printer**
Nr. 01 User display

fig. 8 Components of cash-desk station

Equipment of the exit lane, directly controlled by the PL Controller unit:

Nr. 01 620 Rapid barrier ver. RH
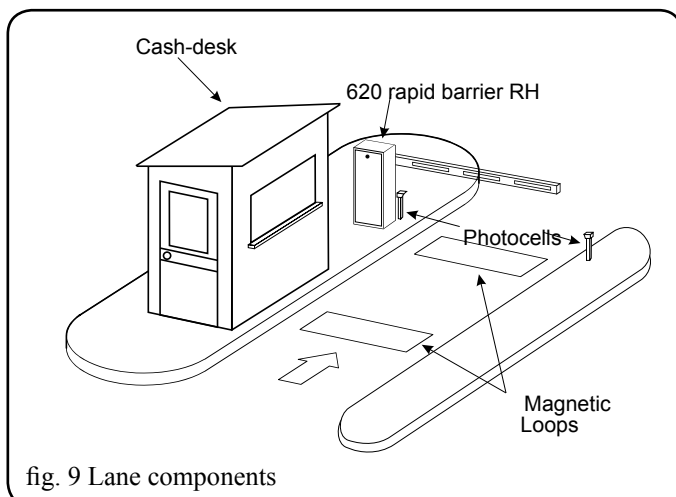**Nr. 02 Magnetic loops.**
Nr. 01 Pair of photocells. *

fig. 9 Lane components

* optional

6.2 ESSENTIAL REQUIREMENTS

• The personal computer must use one of the following operating systems: Windows NT, Windows 2000, Windows XP.
• The personal computer must have a free serial port (preferably on the mother board).
• The resolution of the computer monitor must be 1024x768 pixel.
• The computer must have a RAM of at least 256 MB.
• The computer must have at least 2 GB of free memory on the Hard Disk.
• The computer must have a CD reader.
• In the on-lane cash-desk station, at least 7 power sockets for 230Vac/50Hz (8 if the intercom control unit is installed) shall be available to power the devices.
• Arrange the electrical system so that the PL Terminal-board is supplied with 24 Vdc, as the power feeder is not supplied.
• The power cables and the cables for connecting the equipment in the parking system must have the characteristics indicated in paragraph:
7.2 Type of cables.
• Furthermore, all the instructions in paragraph "General safety rules" on page 3 must be respected, and, with reference to the specific electrical preparations, as described in paragraph:
7.1 Safety instructions.
• The exit lane from the parking area managed by the PL Controller must be constructed so that the vehicles coming from different directions can easily get close to the column, to enable the user to hand over the ticket or show a valid transit ticket without any difficulty.
• The on-lane equipment must be protected to avoid as much as possible accidental damage, which could be caused by transiting vehicles.
• The window of the on-lane cash-desk must be suitably sized so that the tickets/cards can be delivered/collected at the operator's station. To this end we advise you to maintain the lower surface at 95 cm from the road bed.
• The on-lane cash desk operates only if the magnetic loops have been correctly connected to it. In fact, the PL Controller was designed to manage all the user exit from lane stages, exploiting these two elements, which are generally defined as: presence loop and transit loop.
The construction and deployment of the loops is fundamentally important to ensure that the system functions correctly. For this reason, observe to the letter all the instructions described in the following paragraphs:
6.3 Making the Magnetic Loops.
6.7 Positioning the equipment.
• The PL Controller was designed to manage the exit of vehicles from a parking area. Therefore, transit by pedestrians must be forbidden in the area reserved for transit of vehicles. Moreover, appropriate signs prohibiting transit by pedestrians must be installed. Where it is not possible to have an entrance/exit gate reserved exclusively for pedestrians, the current legal regulations on the subject must be absolutely observed; (in particular standards: EN 12453 and EN 12445)

• The lane must not allow the exit by two or more vehicles side by side. For this reason, the width of the lane must be appropriately sized, according to the type of vehicle generally used.

• Sufficient space must be provided for every equipment of the parking system, so that all the necessary installation and maintenance operations can be smoothly carried out

• Appropriate signs (not supplied by FAAC), indicating the tariffs and the car park rules must be visibly shown on the entrance lane to the car park.

NB.: All the equipment which can be used in the ParkLite parking system, were designed and tested by FAAC, in observance of the points mentioned above. In order to avoid any kind of unforeseen behaviour, all the rules shown in this manual must be observed.

6.3 CONSTRUCTION OF LOOPS

6.3.1 INSTALLATION

The following instructions must be respected:

• Lay the loops at least 15 cm. from fixed metal objects.

• Lay the loops at least 15 cm. from fixed metal grilles.

• Lay the loops at least 50 cm. from moving metal objects.

• The loops must be laid at a depth of 30mm. to 50mm. from the road surface.

• The loop must be made with a single cable, without making any joints or shunts inside the pits.

• The two ends of the cable issuing from the loop perimeter must be twisted or intertwined with each other at least 20 times per meter, up to the connection inside the PL Controller.

• The twisted cable of the loop must be laid in pipes or cable ducts separated from those used for other purposes (power etc.).

6.3.2 CONSTRUCTION

The shape of the loops must be 'Rectangular'. The corners must be cut at 45° to prevent the cable breaking, due to the vibrations of transiting vehicles or possible settling of the road paving.
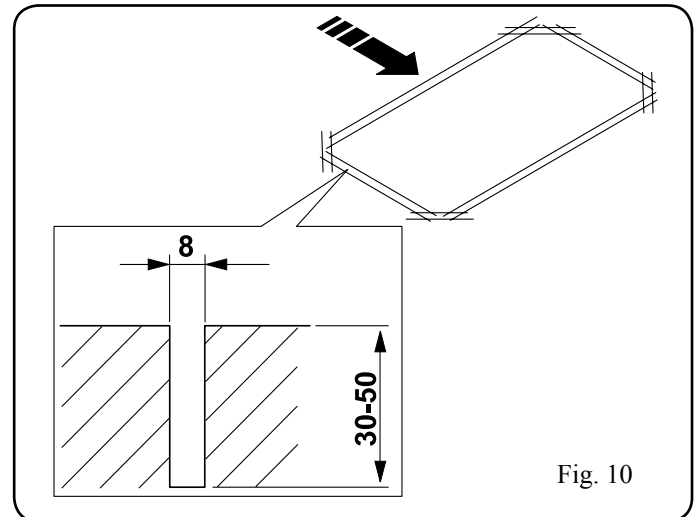
Fig. 10

There are two methods for making them:

• Lay a single single-pole cable with a cross section of 1.5 mm², with double insulation, directly in a chase made in the existing road paving.

• First construct a cable duct in PVC of the necessary shape, insert a single-pole single-insulation cable with a cross-section of 1.5 mm² inside it, and then lay the loop thus constructed inside the chase.

NB.: in both cases, respect the requirements specified in point 6.3.1.

6.3.3 NUMBER OF WINDINGS

The loop must consist of a precise set of windings of the cable described up to here, around the perimeter in which it must be constructed.

Procedure for the above operation: insert the cable end from the sharp edge providing access into the chosen seat, next run it inside for a set of full 'circuits', to make a coil, and then make the same cable come out from the point where it had been inserted.

Loop consisting of 4 windings
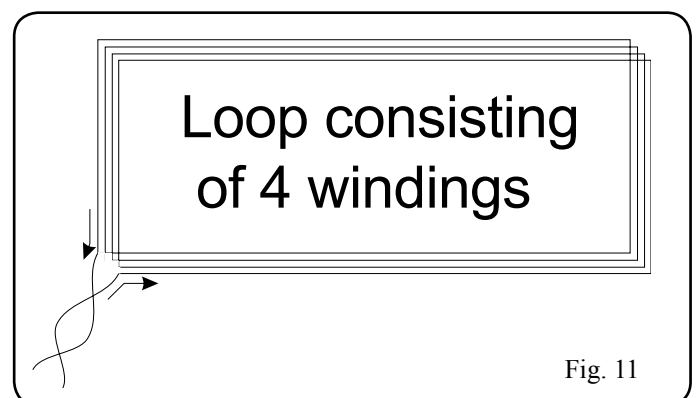
Fig. 11

The windings which must be made in order to construct the loop correctly, depend on the dimension of the perimeter.
The dimensions of the loops to be laid on the lane managed by the PL Controller, shown in the following chapters, <u>call strictly for the construction of **4 windings**</u>.
In fact, the system detects all the transit stages of the vehicles on the entrance lane, making use of these devices. As a result, fewer than specified windings will not make the equipment, assigned to control the lane, operate correctly.
NB.: if there are metal nets under the paving (see the distance of the metal grilles previously referred to), we advise you to add 2 windings to the 4 obligatory windings.

6.4 MASONRY PREPARATION

6.4.1 LAYING THE FOUNDATION PLATE

The foundation plate for securing the 620 barrier is shown in the drawing below, also showing the laying dimensions and method:
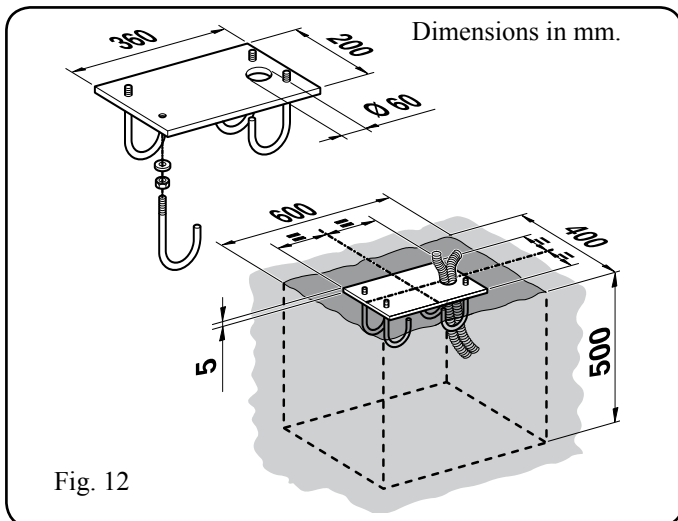
Fig. 12

6.4.2 FASTENING

Barrier 620

• Using a level, check if the foundation plate is perfectly horizontal before installing.

• Secure the upright to the plate with suitable nuts and washers.

**NB:** this manual does not show any securing system for the cash-desk structure, because this article is not supplied by FAAC. For obvious reasons, the installation instructions for this construction must be requested from the relevant producer.

6.5 COMPONENT DIMENSIONS

The picture below shows the dimensions in millimetres of the barrier on the exit lane:

620 Barrier Dimensions
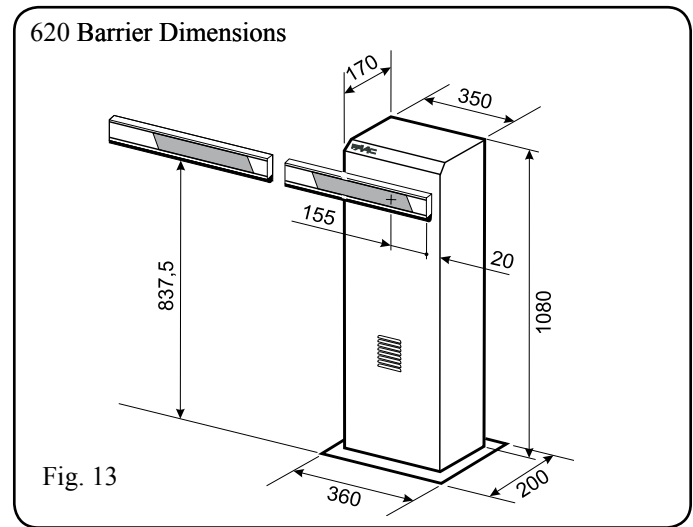
Fig. 13

The dimensions of the barrier rod obviously depend on many different factors: lane width, gate height (in case of on-site installations with cover), etc.
We advise you to determine the size of this element, so that it can move freely.
The dimensions of the cash-desk structure cannot be determined, because they depends on a series of variable factors, such as for example: producer of the structure, type of construction (prefabricated, masonry, etc), available space and location.
However, we advise you to make a construction with sufficient space inside, so that the operator can carry out his job smoothly.
Also consider that the tickets are passed to and from the user and cashier through the cash-desk window. For this reason, size this opening so that the exchange can be effected without any difficulty, when the customer is inside his vehicle.
Finally, make sure that the shape of the construction does not hinder the transit of vehicles along the exit lane.

6.6 PREPARATION OF CHANNELS

Before carrying out the masonry works required to make the lane, prepare all the channels/ducts/raceways essential for cable routing, for electrical connection of the system's equipment.

Lay the cable ducts, scrupulously observing the indications shown in the lay-out below.

Separate ducts must be provided between: high voltage (230

Vac power cables) and low voltage (cables for: commands, safety, intercom, serial data line, etc.).

Furthermore, appropriately size the diameter of the cable ducts to be laid, in relation to the cross-section and number of cables to be inserted. To this end please refer to section **7. Electrical preparations for on-lane cash-desk** of this manual.

Channel lay-out for on-lane Cash Desk

Driving Direction

	1	Input of power cables for the Cash-desk devices
	2	Input and output of cables for data transmission line on RS 485 protocol
	3	Input for intercom line cables
	4	Vehicle Presence loop
	5	Vehicle Transit loop
	6	Open/Closed barrier commands + transit loop safety contact
	7	Input of barrier power cables
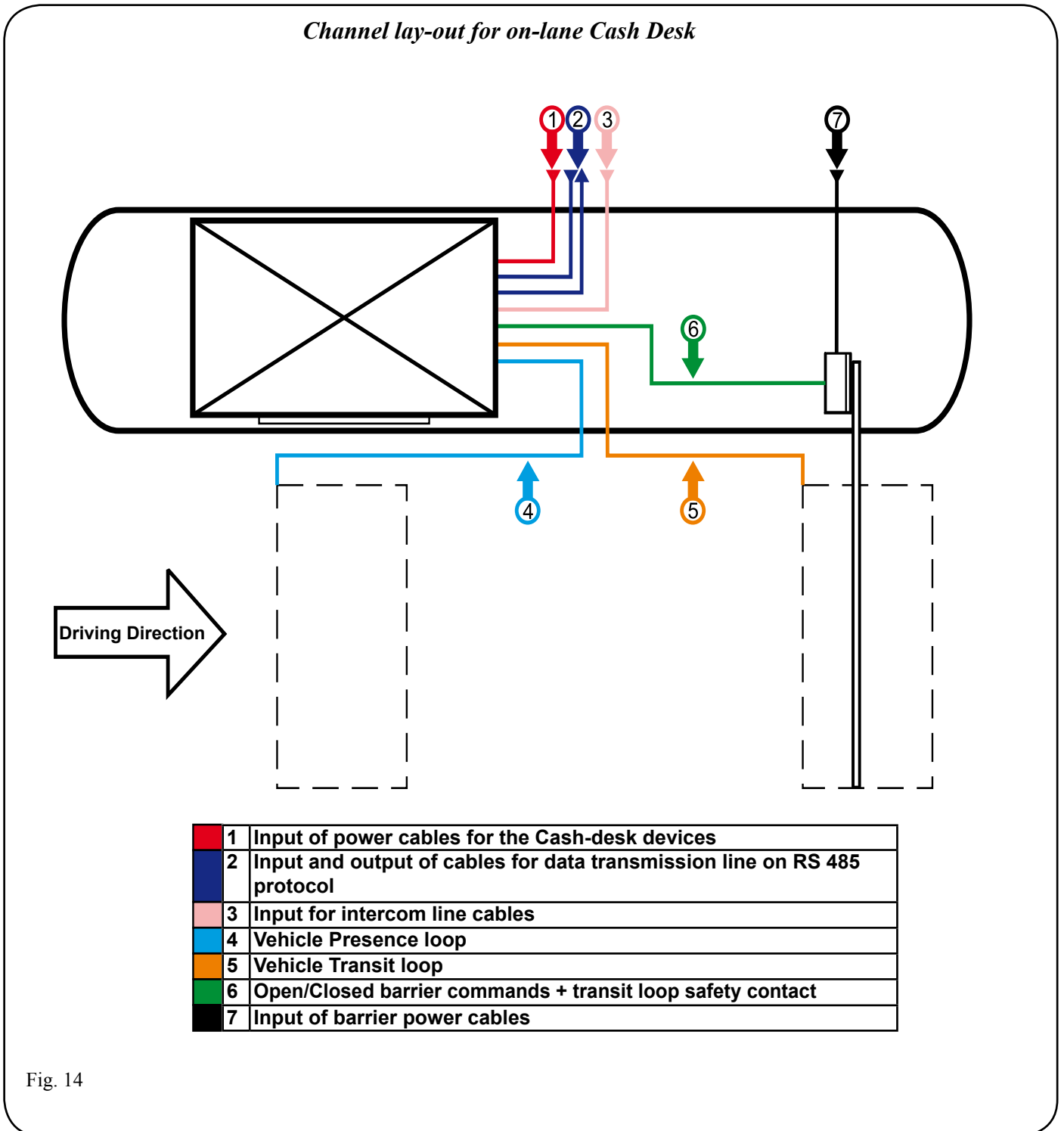
Fig. 14

6.7 POSITION OF EQUIPMENT

To ensure the parking system operates correctly, all the equipment of the exit lane must be positioned, strictly observing the dimensions shown in the lay-out below:

Equipment lay-out for managing vehicles in Cash Desk on exit lane

- 550mm
- 200mm
- Foundation plate for 620 rapid barrier (RH version)
- 3000mm
- 300mm
- On-lane Cash Desk (middle of window)
- 100mm
- 1000mm
- 2200mm
- Presence loop
- Transit loop
- 1000mm
- 2000mm
- Driving direction
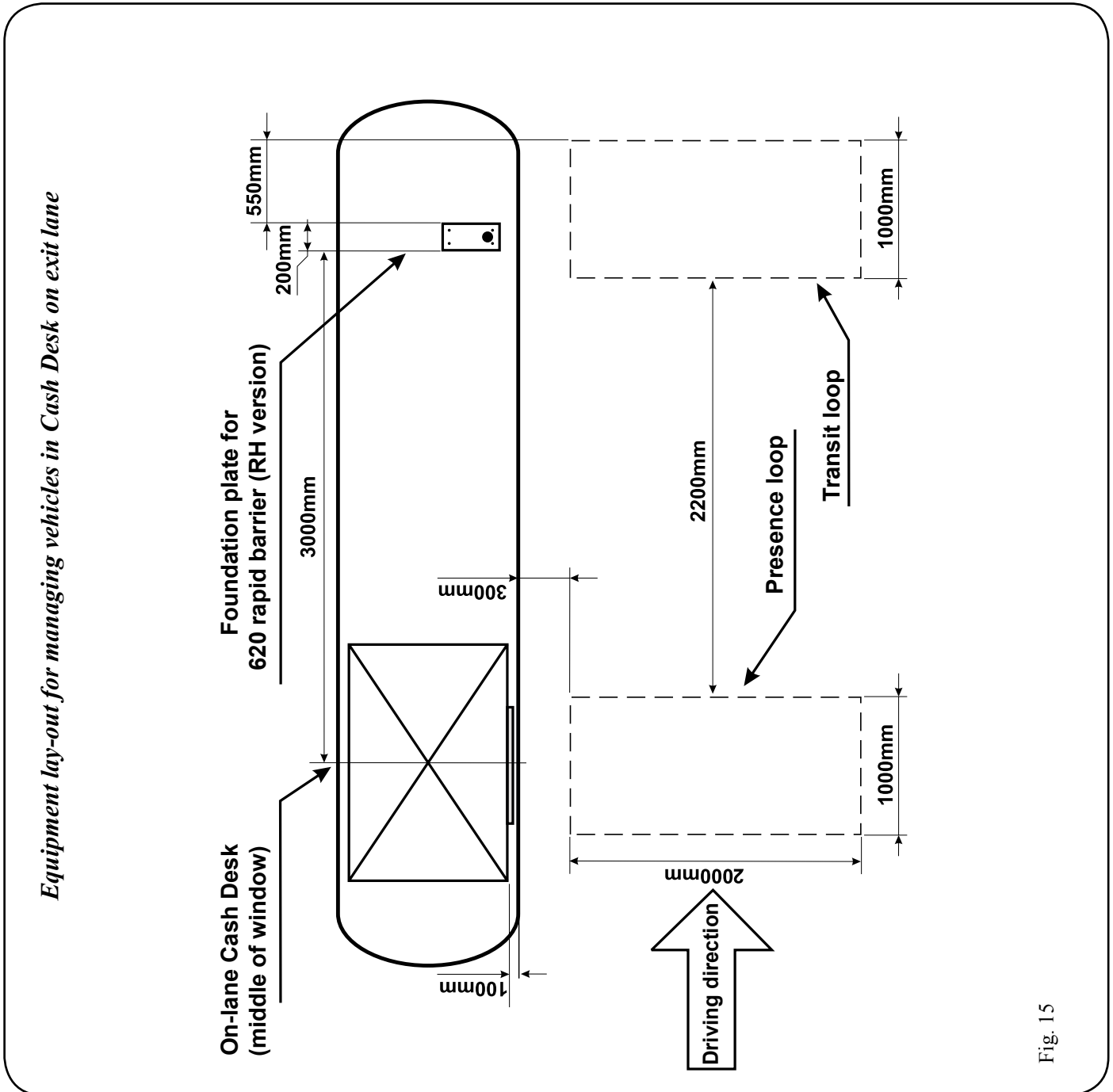
Fig. 15

7. ELECTRICAL PREPARATIONS FOR ON-LANE CASH DESK

7.1 SAFETY INSTRUCTIONS

• Before attempting any action on the system, cut out the electrical power supply.

• Install an omnipolar switch upstream of the power supply line for the devices, with contact opening distance of 3 mm. or more. We advise you to use a 6A thermal breaker with omnipolar switching.

• Make sure that a differential switch with a threshold of 0.03A is installed upstream of the system.

• Make sure that the earthing system is expertly made and connect to it the metal parts.

• Apply all the instructions described in the preceding points to all the devices of the on-lane cash-desk.

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7.2 TYPE OF CABLES

The characteristics of the cables, to be used for connecting the PL Controller, are determined to ensure that the equipment and all the devices connected to it operate well.

For this reason, you must use only the conductors with the characteristics described in the table below:

Electrical preparations for the on lane ParkLite Cash Desk

1	Flame-retardant cable 2 x 1,5 mm² + earth (power supply for device)
2	Single-pole cable 1,5 mm² with single or double insulation of the presence loop
3	Single-pole cable 1,5 mm² with single or double insulation of the transit loop
4	Cable Belden 9841 or CEAM Y09842 with twisted pairs and screened for transmission on data network with RS 485 protocol. All devices must be multidrop-connected as shown in lay-out "Data Line Connections"
5	Shielded cable for intercom 2 x 1,5 mm² (if Legacy model). Telephone pair 0,4 mm² - 275 Ohm/Km Line (Double wire), or telephone pair 0,6 mm² 122 - Ohm/Km Line (Double wire) (if Deluxe model)
6	Flame-retardant cable 2 x 0,5 mm² (input for barrier closure safety)
7	Flame-retardant cable 3 x 0,5 mm² (open/closed barrier commands)

Fig. 16

8. ELECTRICAL CONNECTIONS FOR ON-LANE CASH DESK

8.1 CONNECTIONS ON BOARD

Most of the devices managed by the PL Controller are connected via the Cobra P.Lite board. The lane loops are connected to the PL Terminal-board * (code 102587). The lay-out below shows all the connections that can be made, with the equipment configured as an on-lane Cash-desk:

Equipment connection lay-out for on-lane ParkLite Cash Desk

Fig. 17

* PL Terminal-board code 102587, not supplied with the PL Controller

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8.2 DATA TRANSMISSION LINES

The PL Controller must be connected to a data transmission line, so that all the necessary information can be transmitted/received, in a specific management unit, to which the equipment will be slaved. In the higher performance systems, all the devices which control entrance/exit to/from the parking area, are controlled by a Personal Computer (data controller) by means of the ParkLite software. The lay-out in the following figure shows the connection of the various types of equipment which can be connected to the data transmission line. In addition to this, a table summarises the characteristics required for operation of the data communication networks.

Connection of data lines in a system operating on-line with controller PC and ParkLite management software

Network connection between Concentrator PC and NET PC

• The concentrator PC must share the program's (ParkLite) work directory with all the NET computers for access, reading and writing.
• If the system uses NET stations, both the concentrator PC and the NET PC must have a static address assigned to them.
• The fundamental parameters for network connection between PCs. such as: IP address, Netmask, Gateway, etc, must be supplied by the customer's network administrator.

RS 485 Data transmission line

• Use a paired, twisted and screened cable for transmission on data network with RS 485 protocol, type Belden 9841 or CEAM Y09842 or with identical characteristics.
• All devices must be multidrop-connected as shown in lay-out.
• A maximum of 31 devices can be connected for every line output from the converter.
• The total maximum distance of the network must not exceed 1200 mt.
• Insert a 120 Ohm termination resistor (insert by shifting a jumper on the Cobra control unit or on the converter) at the end of the line.
• Star-type connections are not permitted.
• Do not make any joints on the data transmission cable.

PL Controller

PL Controller

PL Controller

TR Slave

TD Slave

NET

Concentrator

Personal Computer

Personal Computer

Converter

TCP/IP Ethernet LAN Network 10/100 MBit

Wired network socket (RJ45)

Wired network socket (RJ45)

Patch cord for connection to LAN network

Connect to the Com serial port of PC (connector DB9 male)

Fig. 18

8.3 INTERCOM CONNECTION

The intercom is an optional item and can be supplied in two different models, named:

• **LEGACY**

• **DELUXE**

Connection to the intercom control unit depends on the model used. To this end, consult the manual of the intercom that was bought.

9. ON LANE CASH DESK MANAGEMENT UNIT

9.1 P.LITE COBRA BOARD

The PL Controller electronic management unit is defined as: **Cobra P.Lite**. It has specifically created firmware for commanding all devices which need to be controlled in the cash-desk station.

The board manages some processes in a fully independent way, whereas others can be subordinated through the board to the ParkLite management software.

We must underscore the fact that every equipment for treating tickets and cards in the ParkLite system uses this type of unit. The various devices of the system (Ticket Dispenser, Ticket Reader, Cash Desk, etc) make use of this control board with the same firmware. The function to which the equipment is

addressed, is acquired by inserting a jumper, located on the board's CN1 connector.

9.2 JUMPER FUNCTION

Whenever the PL Controller is powered up, the Cobra P.Lite control unit controls the function to which it is delegated, through the jumper fitted on the CN1 connector, and it sets itself to manage all the specified devices for that use. Therefore this jumper must be correctly fitted.

The PL Controller is supplied with the jumper already set as "Cash-desk": fig.19 shows all the settings which can be carried out on the management unit. This figure is included in order to be used, if this board has to be replaced on the equipment. The Decentralised Cash-desk/On-lane Cash-desk option can be selected and set, exclusively with the ParkLite software.

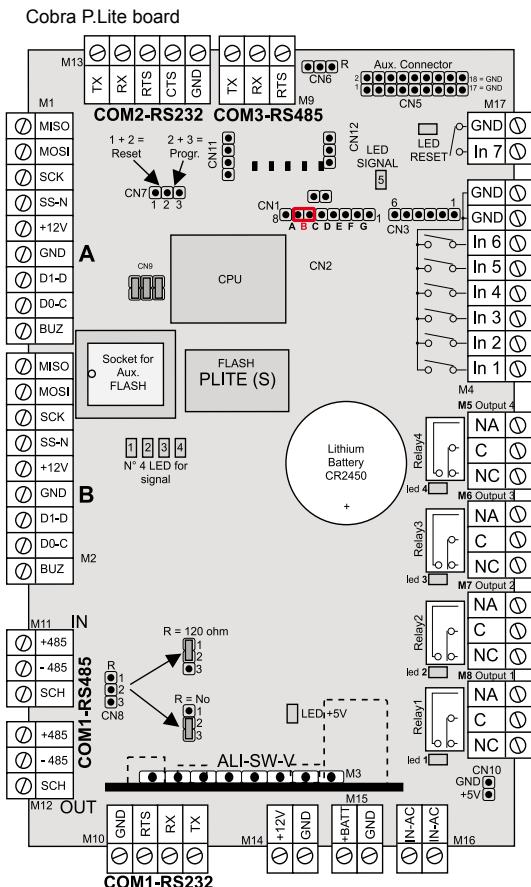## 9.3 RS485 LINE TERMINATION

On the Cobra P.Lite board, there is a connector which makes it possible to fit a 120 Ohm termination resistor on the RS485 data transmission line.

We should stress that this resistor must be used only if the equipment is located on one of the ends of the line section. The CN8 connector is used for this purpose.

Figure 19 shows the insertion of this characteristic.

Set-up of function jumper and insertion of termination resistor

Set-up of function Jumper

Position of Jumper in CN1	Description of function
A	TICKET DISPENSER
B	CASH-DESK (ON-LANE OR DECENTRALISED)
C	SUBSCRIPTION (VEHICULAR)
D	COUNTER/DOOR
E	**TICKET READER**

NB: make sure that the jumper is correctly positioned.

Termination resistor on RS485 network

Position of Jumper in CN8	Description of function
DOWN (Toward ALI board)	120 OHM RESISTOR NOT INSERTED
R (UP)	120 OHM RESISTOR INSERTED

Fig. 19

10. PL TERMINAL BOARD

The lay-out shows the connections of the PL Terminal-board. This device is used for connecting the loops to the Cobra 5000 P.Lite board. Therefore, the PL Controller must be equipped with 1 PL Terminal-board (2 if the gate is for subscriber users),

whenever the unit has to be used or managing transit on one vehicular lane.
NB.: Consider that the equipment is not supplied standard with the PL Controller management unit and that it does not have a 24 Vdc power feeder. Furthermore,, the connection on the M4 terminal-board of the second detector, if any, must be made by the customer.
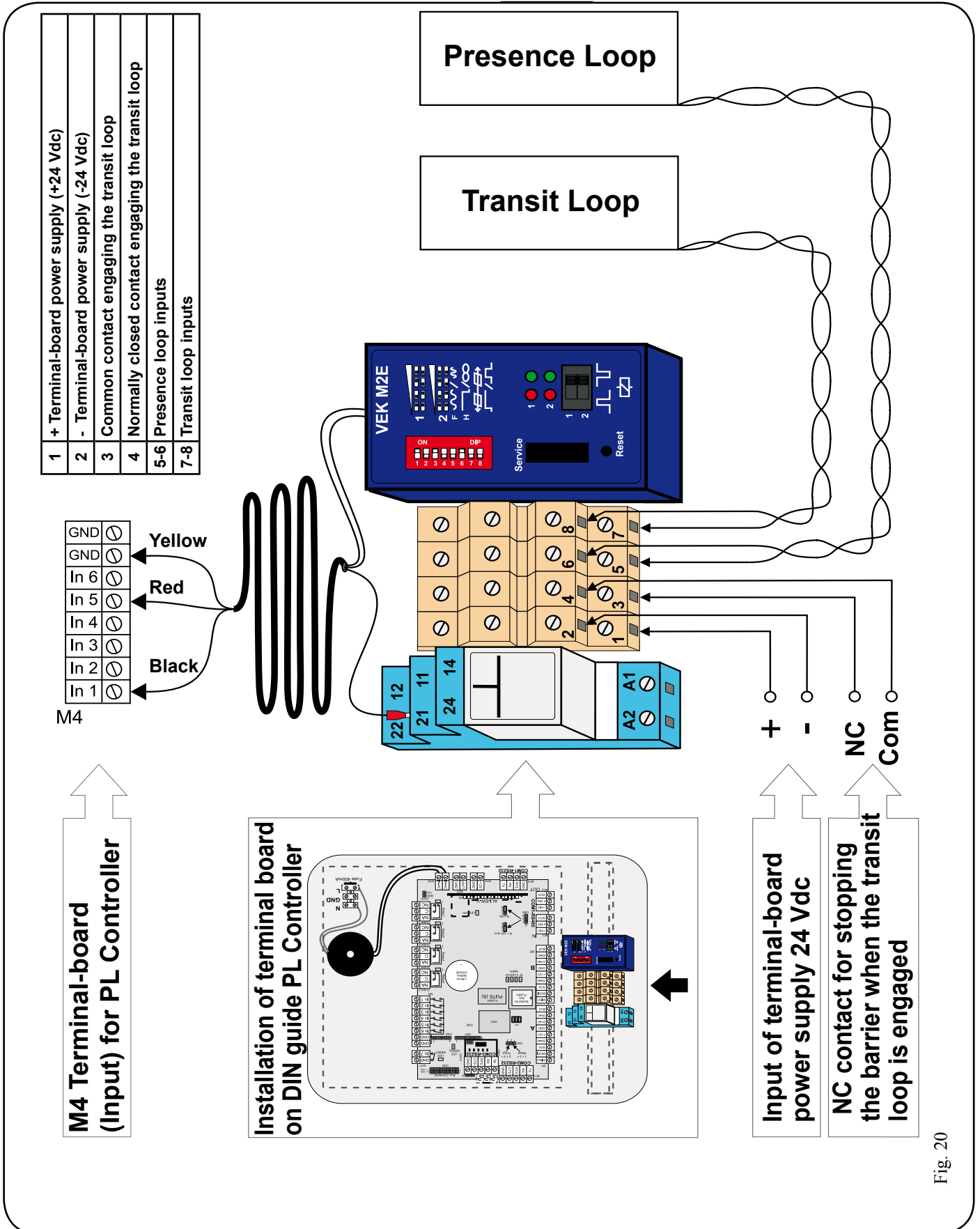

1	+ Terminal-board power supply (+24 Vdc)
2	- Terminal-board power supply (-24 Vdc)
3	Common contact engaging the transit loop
4	Normally closed contact engaging the transit loop
5-6	Presence loop inputs
7-8	Transit loop inputs

Fig. 20

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