

BCR

BARCODE / CONTACTLESS READER

USER MANUAL

PRODUCED BY

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REVISIONS

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1. GENERALITIES

The BCR module is a motorized device for barcode reading of ISO format tickets.

Barcode reading occurs by a laser scanner for transversal printed codes or with a CCD scanner for codes printed longitudinally.

Optionally and in alternative the version with contactless card and ticket reader is available.

The BCR COMBO version, ideal for automatic cashiers and payment operations allows to install both the barcode reader and the contactless card reader.

In this way you can realize parking systems with barcode tickets for occasional parkers and contactless card for season parkers or pre-paid cards for habitual users.

2. ELECTRIC AND MECHANICAL SPECIFICATIONS

2.1 DIMENSIONS AND WEIGHT; BASE AND COMBO VERSIONS

	BASE VERSION	COMBO VERSION
Length:	144.5 mm.	224.5 mm
Width:	104.2 mm.	104.2 mm.
Height:	115 mm.	115 mm.
Weight:	1.2 Kg.	1.4 Kg.

2.2 ELECTRIC POWER SUPPLY

Tension: 24 Vcc +/- 10% Current: at rest < 100 mA in activity 2.5 A max.

2.3 INTERFACE

Standard: RS232

2.4 AVERAGE LIFE

Mechanical parts subject to wear: > 1.000 000 cycles

2.5 ENVIRONMENT CONDITIONS

Working temperature: from + 10 °C to + 50 °C.

Stocking temperature: from - 10 °C to + 60 °C.

Relative humidity: from 10 % a 85 %. RH not condensing

3. MODULE DESCRIPTION

3.1 MECHANICAL STRUCTURE

The module is composed by the following mechanical groups:

- Flanks for title transport
- Card and ticket transport
- Laser scanner
- CCD scanner
- R/W contactless unit

3.1.1 FLANKS FOR TITLE TRANSPORT

The flanks are realized in inox steel and they host the symmetrical transport guides trough which title to be read passes; the right flak hosts the stepping motor and the paper transport devices.
The control electronic board is fixed to the left flank.

3.1.2 TICKET AND CARD TRANSPORT

The transport is guarantied by rubber roller that adapt automatically to card and ticket width between 0.18 and 0.76 mm.
Title movement during insertion, returning to user or swallowing is managed by a stepping motor.

3.1.3 LASER SCANNER

Transversal barcode reader: reading is activated automatically by the BCR module after ticket positioning. After reading, the code read is available and it can be required by apposite command (rif. Communication protocol of the BCR) sent by the host on the serial communication line.
This scanner can read all kinds of barcodes.

3.1.4 CCD IMAGER SCANNER

Also this device, in alternative to the laser scanner, allows the reading of barcodes.
The IMAGER scanner is more performing than the laser scanner because it can read also bad resolution barcodes.
The reading resolution is higher and there is a high tolerance in the reading position.
The reading is activated automatically from the BCR module sliding the ticket under the reader. After reading the code is available and it can be required by apposite command (rif. Communication protocol of the BCR) sent by the host on the serial communication line.
This scanner can read all kind of barcodes and two-dimensional barcodes (pdf).

3.1.5 LONGITUDINAL SCANNER

Optionally the CCD IMAGER scanner can be mounted longitudinally in order to read longitudinally printed barcodes.

3.1.6 R/W CONTACTLESS UNIT

For reading and writing of MIFARE contactless cards in the BCR reader a module in accordance with following standards is employed: ISO 14443-A and ISO 15693. On request the ISO 14443-B standard is available. This module is installed between the two flanks at a distance that allows communication with the card.
The device is connected to the CPU board by the means of the C_LESS connector and it is managed by the CPU board FW trough special protocol encapsulated in the BCR module protocol.

NOTE: during assembling the module is set and tested for optimal functioning; the set changing can compromise the correct functioning of the device.

4. ELECTRONIC CONTROL

4.1 CPU BOARD

All elaboration and management tasks are entrusted to this control board.
The base circuit modules are:

- Microprocessor Fujitsu 16 bit
- Laser Scanner and IMAGER driver interface
- Set of optical sensor for title position survey within the module
- Stepping motor driving circuit
- RS232 serial interface

4.2 MANAGING FIRMWARE

The managing FW controls all functions performed by the module, such as:

- Host communication management through RS232 serial communication port
- Title movement control within the module
- Laser scanner, IMAGER and R/W contactless module communication management.

5. ELECTRIC CONNECTIONS AND PREARRANGEMENTS

5.1 ELECTRIC CONNECTIONS

5.1.1 POWER SUPPLY CONNECTOR

Power supply is given by the connector SUPPLY (JST PH 4x1 PM 90°) with the following pinout:

Pin 1 +24V
Pin 2 +24V
Pin 3 GND
Pin 4 GND

5.1.2 SERIAL INT. RS232 CONNECTOR

The serial interface used for communication with the BCR module is available in the connector RS232 (JST PHD 2x5 PM 90°), with the following pinout:

Pin 1	NC	Pin 2	NC
Pin 3	Tx RS232	Pin 4	NC
Pin 5	Rx RS232	Pin 6	GND
Pin 7	NC	Pin 8	NC
Pin 9	GND	Pin 10	NC

5.1.3 I/O SIGNAL CONNECTORS

It is possible to connect to the BCR module three input digital signals and three output signals open collector type. The I/O connector 1 (JST PHD 6x2 PM 90°) pinout is the following:

Pin 1	OUT 0B	Pin 2	GND
Pin 3	OUT 1B	Pin 4	GND
Pin 5	OUT 2B	Pin 6	GND
Pin 7	IN 0B	Pin 8	GND
Pin 9	IN 1B	Pin 10	GND
Pin 11	IN 2B	Pin 12	GND

5.1.4 I/O SIGNAL CONNECTOR

Besides the I/O signals present on the I/O 1 connector, on the I/O 2 connector an input digital signal and a power output signal are available and ideal to drive a relay.

The I/O 2 (JST PH 4x1 PM 90°) connector pinout is the following:

Pin 1 OUT 3B
Pin 2 GNDPP
Pin 3 IN 3B
Pin 4 GND

5.1.5 OPTO #3 CONNECTOR

On the OPTO #3 connector the connection for a optional external optical sensor is available.

The OPTO #3 (JST PH 4x1 PM 90°) connector pinout is the following:

Pin 1 VCC
Pin 2 OSC
Pin 3 VCC
Pin 4 OPTO

5.1.6 STEPPING MOTOR CONNECTOR

The connection of the stepping motor occurs by the means of the connector MOTOR (AMP MODII 4 PM 90°) with the following pinout

Pin 1 OUT 1
Pin 2 OUT 2
Pin 3 OUT 3
Pin 4 OUT 4

5.1.7 SCANNER CONNECTOR

The laser scanner is connected to the CPU board by the means of the connector BCR (JST PH 4x1 PM 90°) with the following pinout:

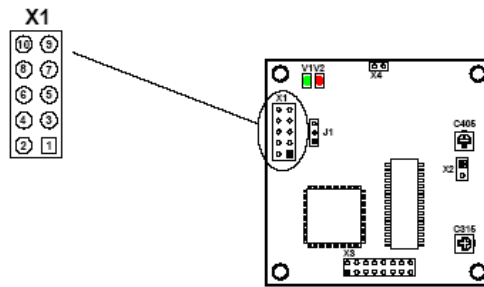
Pin 1 VCC
Pin 2 GND
Pin 3 LASER_TRIGGER
Pin 4 TX

5.1.8 CONTACTLESS MODULE CONNECTOR

The contactless module is connected to the CPU board by the means of the connector C_LESS (JST PHD 2x5 PM 90°) with the following pinout:

Pin 1 VCC	Pin 2 Rx1
Pin 3 Rx1_RS232	Pin 4 Tx1
Pin 5 Tx1_RS232	Pin 6 I/O AUX1B
Pin 7 C_GND	Pin 8 C_GND
Pin 9 I/O AUX0B	Pin 10 I/O AUX2B

Following drawing and form show the pinout of the connector that must be inserted in the contactless module.



X1 Pin N°	Function	Description
		ID CPR.M02 –B/-BA
3	TxD	RS232 TTL –Transmit data
4	GND	GND
5	RxD	RS232 TTL –Receive Data
8	VCC	+5V DC
9	GND	GND

5.1.9 PROGRAMMING CONNECTOR

The firmware download occurs by the means of the connector FLASHPRG (JST PH 4x1 PM 90°)

- Pin 1 GND
- Pin 2 TX
- Pin 3 GND
- Pin 4 RX

5.2 BUTTONS

The RESET button allows to reset the board without disconnecting power supply.
 The SWP1 button activates the ticket issue function.
 The SWP2 button activates the barcode scanner.

5.3 DIP SWITCH

The dip switch SW1 allows the execution of special statements and to activate the firmware download.
 The dip switch function is the following:

- Dip 1 On = Contactless reader Off = Barcode reader
- Dip 2 On = Activates the reverse ticket reading function Off = Disabled function
- Dip 3 On = Activates the barcode slow reading function Off = Disabled function
- Dip 4 On = Disabled function Off = Activates an Output switch off timer
- Dip 5 RESERVED
- Dip 6 On = firmware Download

See paragraph 6 for programming procedure

5.4 SIGNALLING LED

- DL1 Photo sensor status display OP1
- DL2 Photo sensor status display OP2
- DL3 Photo sensor status display OP3
- DL4 On in programming
- DL5 Display trough flash sequences machine status and possible alarms

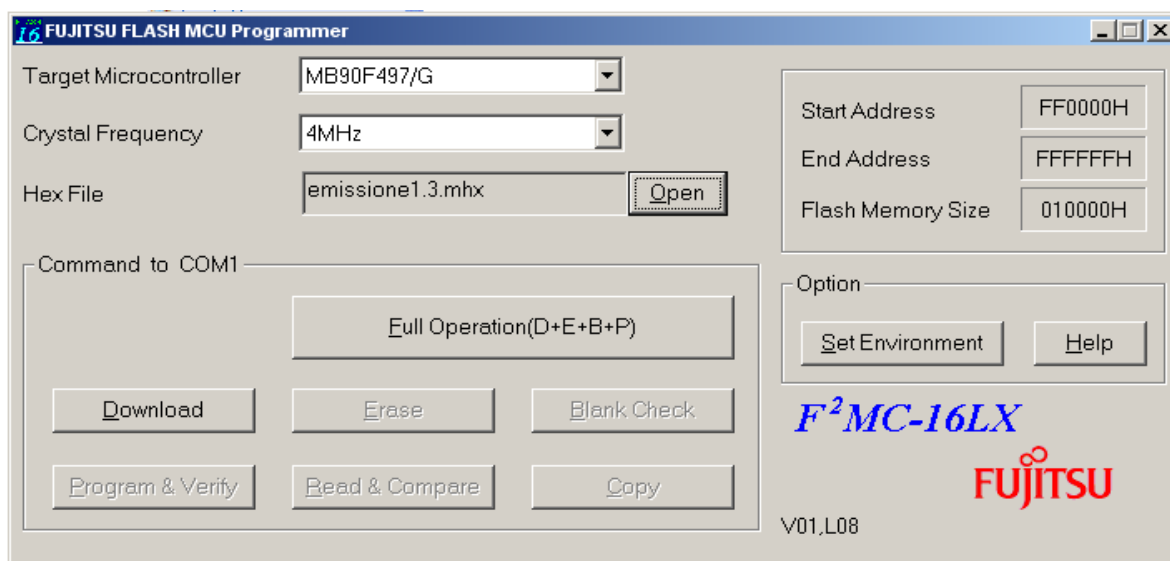
FIXED ON Regular functioning

1 FLASH	Command in execution
2 FLASHES	Command not executed for title not present in the module
3 FLASHES	Command not executed for title already present in the module
4 FLASHES	Command not executed for reading already enabled
5 FLASHES	Position error
7 FLASHES	Title jammed
8 FLASHES	Configuration not valid

6. PROGRAMMING PROCEDURE

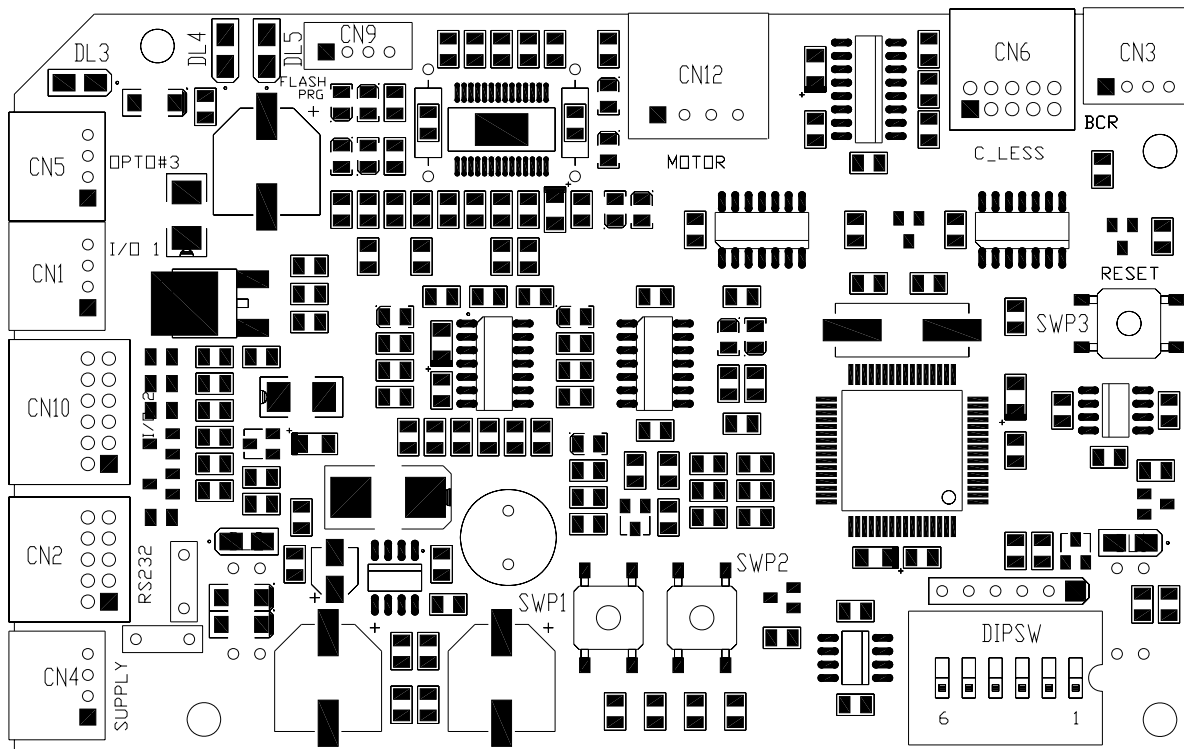
For FW download, after setting dip 4-5-6 follow these instructions:

- Connect serial cable to connector FLASHPRG (JST 4 P.M. a 90°).
- Keep RESET button pressed and, at the same time, move the dipswitch 6 to On position; verify that the DL4 led is on and release RESET button.
- Execute the FUJITSU FLASH MCU Programmer program.
 - Select in the Target Microcontroller field the MB90F497/G model.
 - Select in the Cristal Fquency field the value of 4MHz.
 - Open the file with MHX extension.
 - Select the COM port to which the serial cable is connected.
 - The screen appears as the one on the button if the COM1 port is used.



- Press the “Full Operation(D+E+B+P)” button.
 - When the Flash window appears press “OK”.
 - Wait for procedure to finish.
- At the end of the procedure press OK and close the program.
 - Select in the Target Microcontroller field the MB90F497/G model.
 - Press reset button and at the same time move the dipswitch 6 in Off position and verify that the LED DL4 switches off. Release the reset button.

7. BCR CPU LAYOUT



LAYOUT SCHEDA AD067

8. ADJUSTMENTS AND SETTINGS

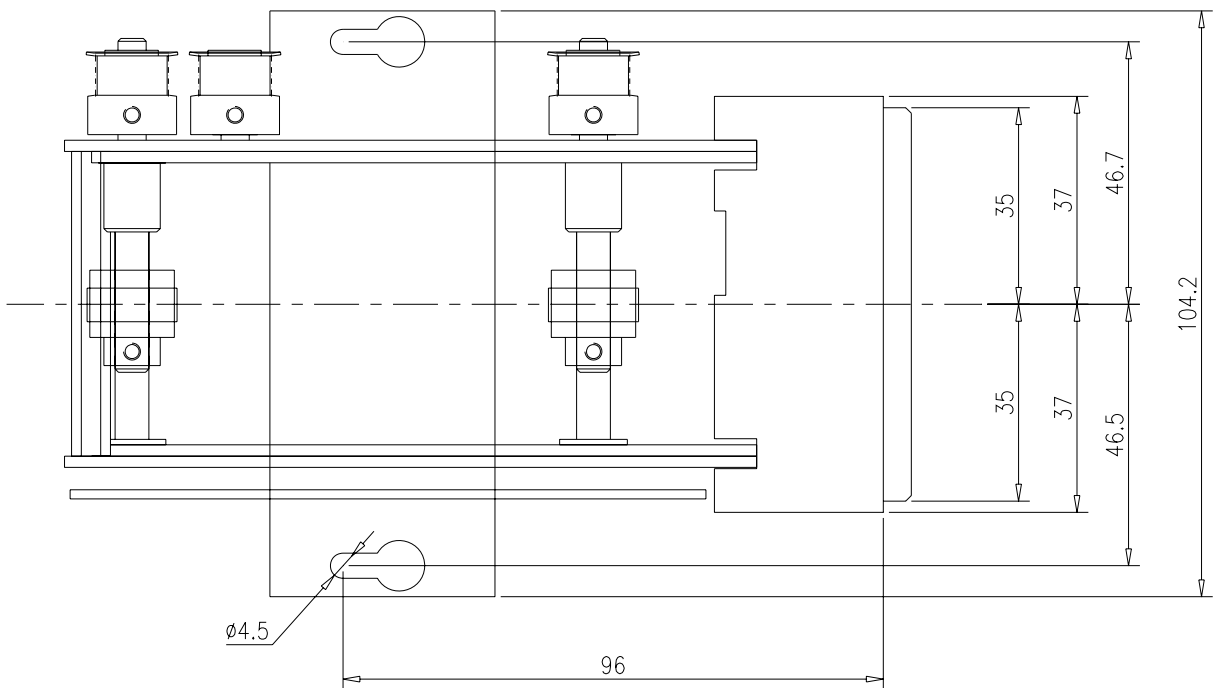
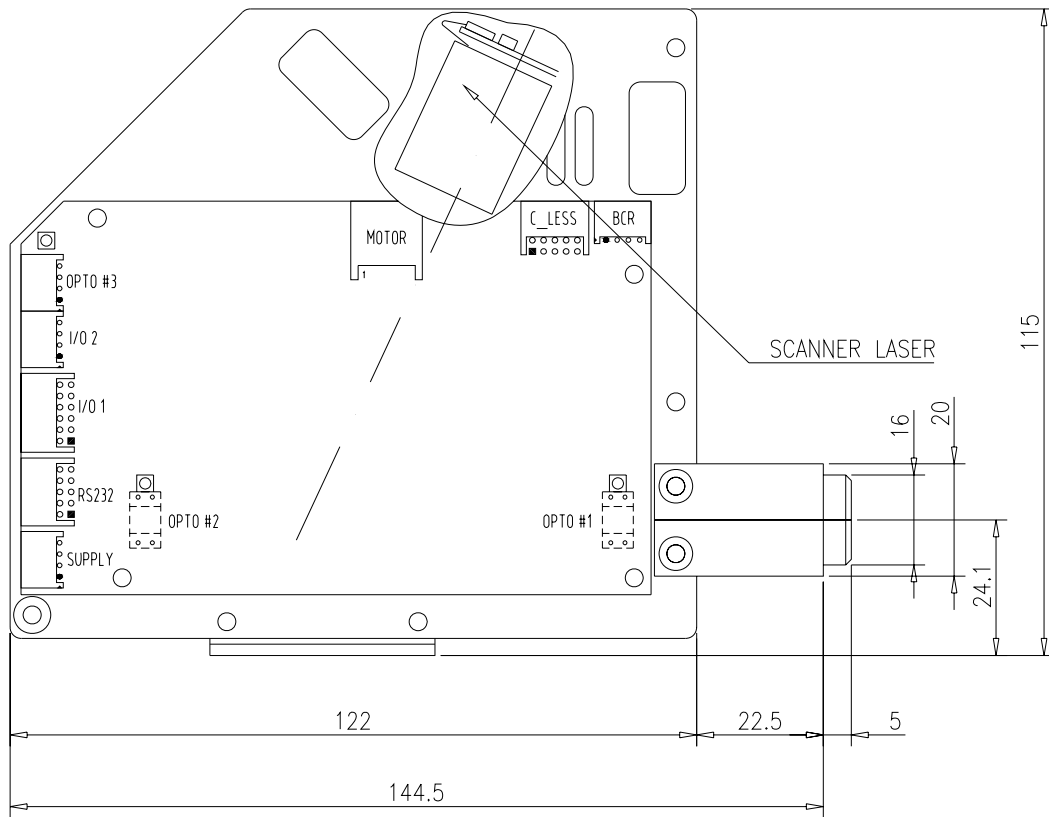
8.1 BARCODE AND CONTACTLESS READER SETTING

The barcode reader is regulated in the position that guaranties best reading performances of barcodes. The change of this position can reduce or compromise reading reliability.

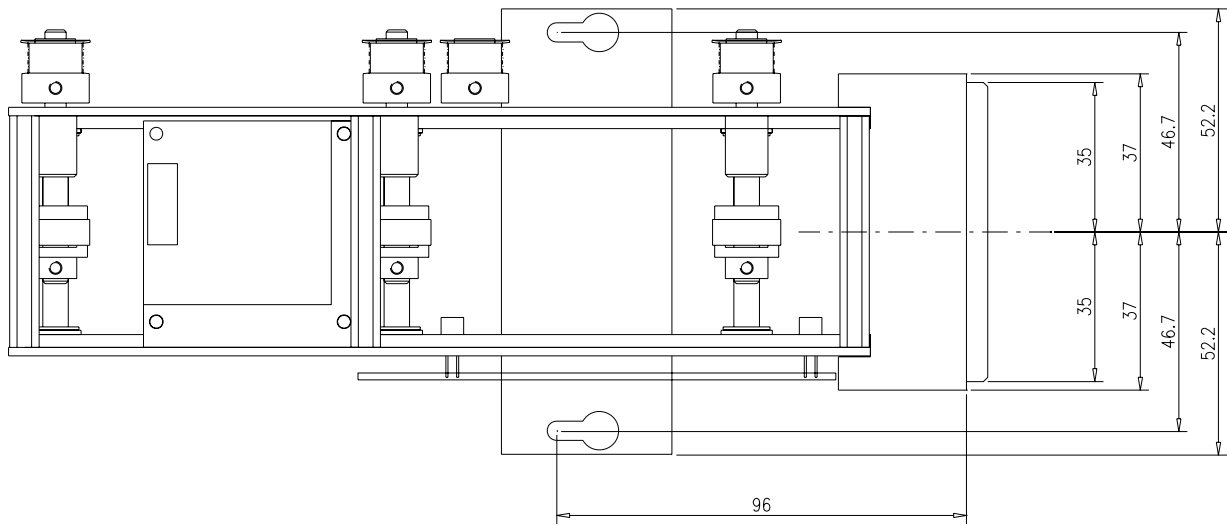
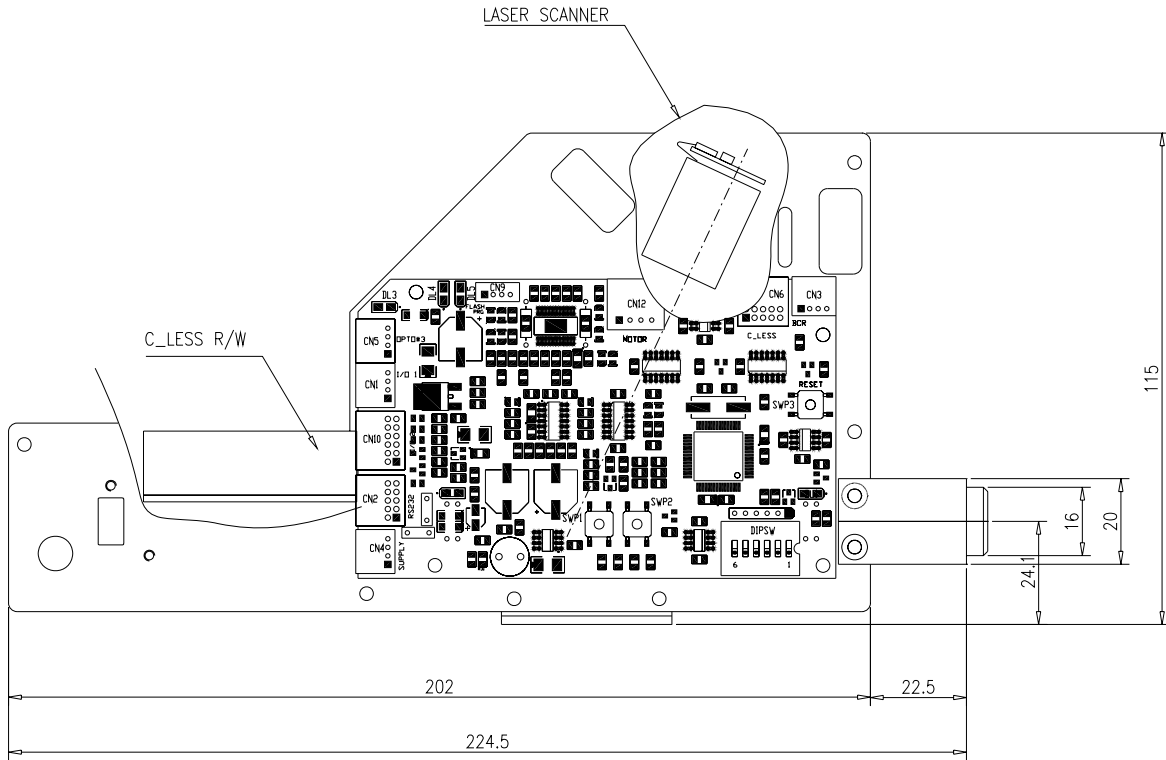
8.2 BARCODE READING POSITION SETUP

The communication protocol provides a special command to define the ticket position under the scanner.

It is recommended to position barcode printing near the front edge f the ticket.



BARCODE VERSION



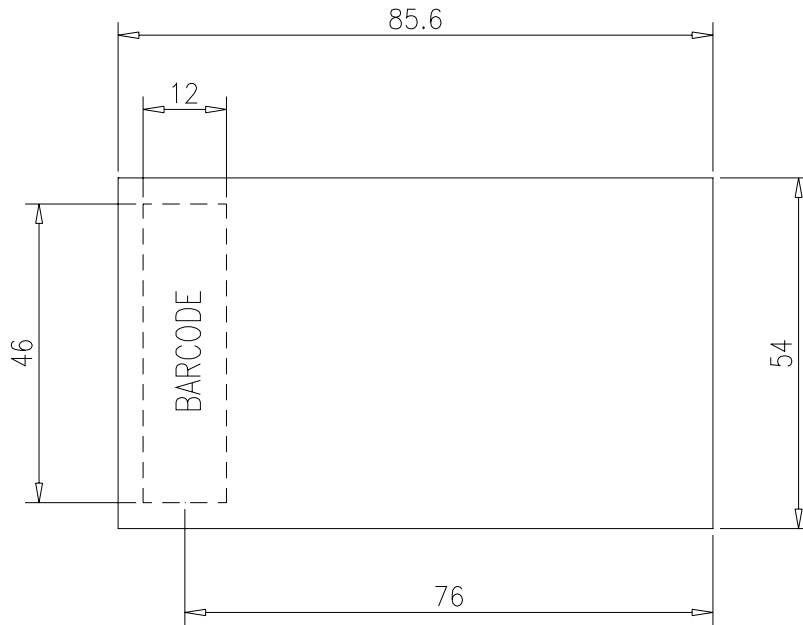
COMBO VERSION

10. CONTACTLESS TICKET AND CARD FORMAT

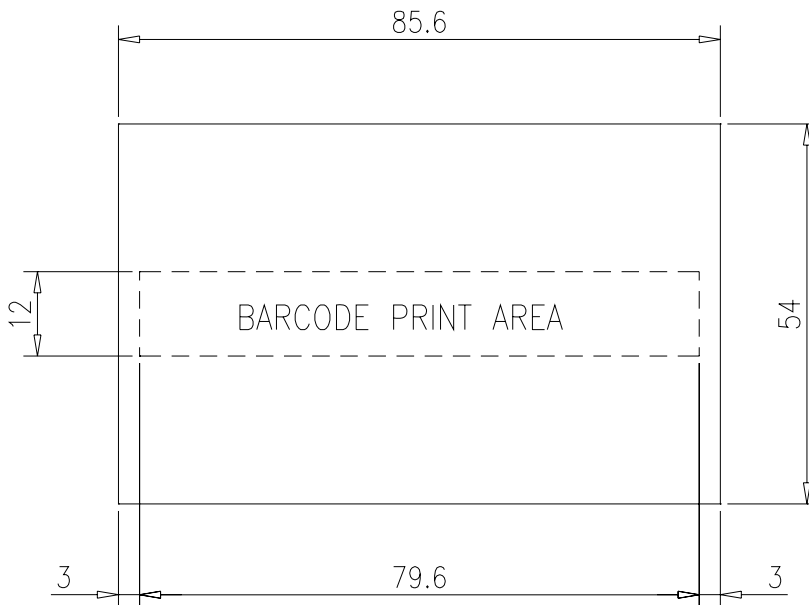
The contactless card in paper or in plastic format is ISO.

The paper ticket with barcode can be in fan fold or cut directly from roll and with following dimensions: 54x85,6 mm.

Here following is the recommended barcode ticket printing layout.



TRANSVERSAL BARCODE



LONGITUDINALE BARCODE