

1 GENERAL INFORMATION

1.1 Product description of MEDIO L100 + AERO LI antenna

The Aero LI is a single loop antenna with ferrite which has been optimized for use with the TAGSYS Medio L100 readers for library check in and check out applications.

For the library application, the Medio L100 + Aero LI antenna are recommended for:

- Check in and check out stations at the circulation desk
- Self borrowing stations
- Automatic book return
- Automatic sorting stations

Note - The equipment is professionally installed, and the operator can't access to the MEDIO L100. For this application, the typical configuration is 1 antenna connected on the Medio L100 with 1.5Watts.

The "AEROLI product" (Medio L100 +AEROLI antenna) uses the coupler's RF output (Channel 1) to radiate the magnetic field and power up the smart label, The signal is modulated by the coupler (Medio L100) to communicate commands to the smart label. The antenna (AERO LI) also receives modulation from the smart label acting as a field disturbing device. This signal is then delivered to the coupler. The Medio L100 can communicate to the Personal Computer via the RS232 serial port.

AEROLI antenna description :

The Aero LI antenna is provided with rubber feet to operate in a standard desktop configuration. However, a fixing set is also included to allow hard attachment (see chapter Installation for further details).

The Aero LI antenna has been factory calibrated to an impedance of 50Ω which offers optimal performances when the antenna is put on the surface of the desk or table.

Optimal performances are achieved when the smart labels to be read are parallel to the antenna surface and centered on the antenna surface.

Medio L100 description :

The TAGSYS' Medio L100 smart label packaged coupler is intended for used with AEROLI Antenna. It has therefore specifically been designed to simplify system integration.

It incorporates hardware, software and other components that manage the Radio Frequency (RF) interface as well as external connections for power, data exchange and for various communication protocols.

For more information, see product's data sheet at section 1.6.

1.2 Related Submittal(s) / Grant(s)

All host equipment used in the test configuration are FCC granted, when relevant.

1.3 Tested System Details

The FCC IDs for all equipment, plus description of all cables used in the tested system are :

Trade Mark – Model Number (Serial number)	FCC ID	Description	Cable description
AEROLI* pn: SE10230A0 (sn: M027010039)	QHK100AEROLI	Contactless smart label read/write	Coaxial cable with ferrite
MEDIO L100 * pn: SE10120B0 (sn: M029010009)			RS232 shielded cable Parallel shielded cable Power cable unshielded
FOLIO 20 D5 (sn: 055AA55AAFDA666242)	None	Smart label	
HEWLETT PACKARD Vectra 500 series (sn: FR72565009) pn: D5083A	B94Vectravemt	Personnel computer	All data cables are shielded Power cable unshielded
HEWLETT PACKARD pn:D2846 (sn JP74001000)	Doc of Conf	21" color monitor	Shielded video cable with ferrite at each end. Power cable unshielded.
HEWLETT PACKARD pn:C4734-60111 (sn: M971168931)	GYUR38SK	Keyboard	Shielded cable
HEWLETT PACKARD pn:C4736-60101	JNZ201213	Mouse	Shielded cable

*Equipment Under Test

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4-1992, FCC Part 15 Subpart C.

Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.5 Test facility

Tests have been performed on October 14th, 2002.

The test facility used to collect the radiated and conducted data is the SMEE **Actions Mesures** facility, located ZI des Blanchisseries, 38500 VOIRON, France. This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4-1992 in a letter dated August 04, 1999 (registration number 94821).

This test facility has also been accredited by COFRAC (French accreditation authority for European union test lab accreditation organization, standard **NF EN ISO/IEC 17025**), accreditation number 1-0844 as compliant with test site criteria and competence in EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.

1.6 Data sheet of Medio L100 used with AEROLI

1.6.1 AEROLI antenna

Specification Summary

Housing	Plastic ABS UL 94-V0
Dimensions	288 x 263 x 17 mm
Weight	2 kg
Color	Pantone P536 blue
Protection class	IP 21

Table 2: Mechanical Data

Operating Temperature	0°C to 55°C
Storage Temperature	-25°C to +60°C

Table 3: Temperature range

Maximum Transmitting Power	1,5 W
Operating Frequency	13,56 MHz
Impedance	$50 \Omega \pm 5 \Omega$ and $0^\circ \pm 5^\circ$
Antenna Connection	BNC 50 Ω
Antenna Connection cable	RG 58 50 Ω , Length 1,5 m
Typical Performances (*)	Reading: 18 cm Writing : 14 cm

Table 4: Electrical Data

1.6.2 MEDIO L100

Medio L100 Key Features

- 13.56 MHz RF packaged coupler
- Multiple tag compatibility (TAGSYS and ISO15693 chips)
- Standard application softwares
- Software-configurable multiplex operating mode
- Two dedicated processing units, namely a microcontroller for the customer application and a Digital Signal Processor (DSP) unit for real-time signal processing
- Serial communication with an embedded end-user application
- Multi-purpose configurable industrial I/O Port
- Parallel port monitoring

Power Supply

The Medio L100 packaged coupler must be powered with 100V-240V AC 47/63Hz.

RF Channel 1

Medio L100 used with AERO LI Antenna

The Medio L100 in this packaged coupler can drive one antenna. The RF channel can drive up to 1.5 watts. Channel LEDs indicate whether the RF field is transmitting (in which case the green light is on) or not (no light).

Warning: Switching the RF field on over a channel without connecting an antenna beforehand can cause permanent damage to the packaged coupler.

I/O Port Connector

The Medio L100 packaged coupler provides four Inputs/Outputs (I/O).

When configured as outputs, I/Os are open drain (250mA). A pull-up supply must be connected to the I/O port reference input (VIN). The pull up supply range is 5V-28V.

When configured as input, the I/Os input range signal is 0V-28V.

I/O port LEDs indicate whether the I/O is configured for input (green light) or output (red light).

Please refer to I/O Port chapter for further information.

Note: Each input can independently trigger microcontroller interrupts. This can be used to trigger smart label reading processes in accordance with the input signals applied to the I/O port. In this case, a specific application software such as ModBus is required.

Note: Industrial I/O ports can only be accessed via the Data Processing Unit (DPU).

Serial Connector

The serial connector is used to communicate with the external environment. User commands and data exchanges are transmitted through this port which can be set to RS-232, RS-485 or RS-422 mode by the software. Different Baud rates can be defined for each mode.

The Default Mode is defined by the application software which is downloaded in the Medio L100.

Tx (Transmit data) and Rx (Receive Data) LEDs display the activity of the serial port.

Note: The RS-232 cable is null modem cable.

Note: Please refer to Embedded Application chapter for further information about Application Software.

Monitoring Port (Parallel Port)

The monitoring port communicates directly with the Radio Processing Unit (RPU). When the parallel cable is plugged in, the Data Processing Unit (DPU) is automatically deselected. The parallel port can be used as a monitoring tool or as a means to upgrade the Medio L200/L100 firmware.

Note: The parallel cable is pin-to-pin DB25. A shielded cable must be used to prevent disruptions when high output power is used on antennas.

Note: Please refer to Medio L100 Architecture chapter for further information about RPU and DPU. Please refer to "Medio L100 Firmware Reference" for further information about Medio L100 Firmware.

Antennas

The Medio L100 is primarily designed for use with Aero-LC antennas. Nonetheless, it is also operational with other TAGSYS antennas (ex AERO LI antenna), provided that the power applied to the antenna does not exceed antenna specifications.

Note: The performances of the packaged coupler have been characterized for a three-meter antenna cable. Optimized operation is not guaranteed with a cable length other than three meters.