

## 1 GENERAL INFORMATION

### 1.1 Product description of L L100 + L-SA1 antenna

The 16-book Library Stack Antenna (L-SA1) is composed of two loop antenna with ferrite, 30mm from each other, providing a large area of detection. This antenna is optimized for use with the TAGSYS L-L100 Library reader for library check in and check out applications.

For the library application, the L-L100 + L-SA1 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 L-L100. For this application, the typical configuration is 2 antennas connected on the L-L100 with 1Watt.

The "L-SA1 product" (L-L100 +L-SA1 antenna) uses the coupler's RF output (Channel 1 & 2) to radiate the magnetic field and power up the smart label, The signal is modulated by the coupler (L-L100) to communicate commands to the smart label. The antenna (L-SA1) also receives modulation from the smart label acting as a field disturbing device. This signal is then delivered to the coupler. The L-L100 can communicate to the Personal Computer via the RS232 serial port.

#### **L-SA1 antenna description :**

The L-SA1 antenna is provided with rubber base pads for installation in a standard desktop configuration..

The L-SA1 antenna has been factory calibrated to an impedance of  $50\Omega$  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.

#### **L-L100 description :**

The TAGSYS L-L100 smart label packaged coupler is intended for used with L-SA1 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. All parameters (RF output Channel 1&2 and power) are set in factory.

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
L-SA1* pn: SE10853A0 (sn: proto)	QHKLSA1ANT	Contactless smart label read/write	Coaxial cable with ferrite
L-L100 * pn: SE10120B0 (sn: M029010004)			RS232 shielded cable Parallel shielded cable Power cable unshielded
FOLIO 20 D6 (sn: none)	None	Smart label	
DELL latitude CPi model PPL (sn:0006692D-12800-031-2130)	Doc of Conf	laptop	All data cables are shielded
Dell model PA-6 pn:9364U	Doc of Conf	adapter	Power cable unshielded.

\*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 February 11<sup>th</sup> & 31<sup>st</sup>, 2003.

The test facility used to collect all the test 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 C63.4-2000 in a letter dated July 19, 2002 (registration number 94821).

This test facility has also been accredited by COFRAC (French accreditation authority for European union test lab accreditation organization) according to NF EN ISO/IEC 17025, accreditation number 1-0844 as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and 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 L-L100 used with L-SA1

### 1.6.1 L-SA1 antenna

#### *Specification Summary*

Housing	Black Polystyrene or Blue Plastic ABS UL 94-V0
Dimensions	650 x 440 x 18 mm (with cover)
Weight	5 kg
Color	Pantone P536 blue or Black
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 Input Power	1 W
Operating Frequency	13.56 MHz
Impedance	$50 \Omega \pm 5 \Omega$ and $0^\circ \pm 5^\circ$
Antenna Connection	BNC $50 \Omega$
Antenna Connection cable	RG 58 $50 \Omega$ , 3m Length
Typical Performances (*)	Reading: 18 cm Writing : 14 cm

Table 4: Electrical Data

(\*) Tests results in laboratory with L-L100 Library reader and Folio 20 in standard desktop configuration.

## 1.6.2 L-L100

### **L-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 L-L100 packaged coupler must be powered with 100V-240V AC 47/63Hz.

### **RF Channel**

#### **L-L100 used with L-SA1 Antenna**

The L-L100 in this packaged coupler can drive two antennas. The RF channel can drive up to 1 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 L-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 L-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 L-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 L-L100 Architecture chapter for further information about RPU and DPU. Please refer to "L-L100 Firmware Reference" for further information about L-L100 Firmware.*

### **Antennas**

The L-L100 is primarily designed for use with Aero-LC antennas. Nonetheless, it is also operational with other TAGSYS antennas (ex L-SA1 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.*