1 GENERAL INFORMATION

1.1 Product description

The "TR Stack product" is a Tag Reader.
The "TR Stack product" (Medio L100 + TR Stack 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 (TR Stack antenna) also receives modulation from the smart label acting as a field disturbing device. This signal is then delivered to the coupler. The equipment can communicate to the Personal Computer via the RS232 serial port. The antenna (see setup antenna for more details) are tuned in the factory at 13.56 MHz.

Optimal performance is achieved when the tags to be read are placed parallel to the antenna surface and centered on the antenna surface.

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 2Watts.

Figure 1: TR Stack Antenna

MEDIO L100 description :
The TAGSYS' MEDIO L100 smart label packaged coupler is intended for used with TR Stack 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.

Antenna description:
Size : 650x440x10 mm

This antenna is composed of a PCB located on a support, providing a large area of detection. This antenna is optimized for use with the TAGSYS TR-L100 (MEDIO L-100) reader for multiple check in/out operations.
This antenna is delivered with a black plastic cover. In this case, a non-metallic material must be used for this packaging. The cover is not removable.

Although this antenna has been specifically designed for laundry applications, it can also be used for any application requiring a desktop station.

The antenna has been factory calibrated to an impedance of 50? which offers optimal performance when the antenna is installed on the surface of the desk.

The TR Stack product (medio L100 +TR Stack Antenna) is a product developed by the TAGSYS Company

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:

See test report files.

1.4 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4(1992+2000), CISPR22-1997/A1:2000/A2:2002 and EN55022:1998/A1:2000/A2:2003.

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 2nd & 3rd, 2004.

The test facility used to collect all 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 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 the TR Stack Product

1.6.1 TR Stack Antenna

TECHNICAL DATA

Mechanical Characteristics

Description	Value
Housing	Black Polystyrene
Dimensions (with Cover)	440 x 650 x 18 mm. (17? x 25½ x ? in.)
Weight	1,5 kg. (3,5 lbs.)
Color	Black
Protection Class	IP 21
Operating Temperature	0 °C to 55 °C (32 °F to 131 °F)
Storage Temperature	-25 °C to +60 °C (-130 °F to 140 °F)

Electrical Characteristics

Description	Value
Maximum Input Power	2 W
Operating Frequency	13.56 MHz
Impedance	50 ± 5 Ω and 0 ± 5 °
Antenna Connection	50-Ω BNC Connector
Antenna Connection cable	50-Ω RG 58 cable (Length: 3 m.)
Typical Performances (*)	Reading: 7 in. (178 mm.) Writing: 5½ in. (140 mm.)

(*) Tests results in laboratory with TR-L100 Laundry reader and a single Ario 70 SM smart label in standard desktop configuration.
For multiple book transactions (up to 2 stacks of 4 books each), optimal performance will be reached under the following conditions:

- Minimum book thickness of 10 mm.
- Maximum stack height of 100 mm.
- 4 different tagging positions applied
- Book bindings facing each other and placed close to the center of the RF loop.

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 Laundry Conveyor Station

The MEDIO L100 in this packaged coupler can drive one antenna. The RF channel can drive 2 watts. (For TR Stack antenna application)
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 designed for use with TR stack antenna .

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.