User Guide

SASL™ (Signal Acquisition & Source Location unit)

RF Controls Intelligent Tracking and Control System (ITCS™)

ITCS-A-2xx Family
Models

ITCS-A-200
ITCS-A-202

Introduction

This **SASL™ User Guide** provides the basic information needed to install an individual **SASL** antenna unit. This guide is not intended to provide instructions for installing, configuring and calibrating the RF Controls Intelligent Tracking and Control System (**ITCS™**). Detailed instructions are provided in the **Technical Manual** (ITCS-A-100-002) and **Programmer's Reference Guide** (ITCS-A-100-003).

INTENDED AUDIENCE

This guide is intended for those who will install and set up the RF Controls **SASL** (Signal Acquisition and Source Location) unit. Before attempting to install, configure and operate this product, you should be familiar with the following:

- Windows based software installation and operation
- Device communication parameters including Ethernet and serial communications
- RFID reader configuration including antenna placement and RF Parameters
- Electrical and RF safety procedures.

CONTENTS

1. SASL overview
2. Installation
3. Software
4. Specifications
5. Safety instructions

FCC NOTICE

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CONTACT INFORMATION

RF Controls, LLC
1141 S. 7th Street
St. Louis
MO 63104-3623
USA

Phone: +1 314 571-6200   Fax: +1 314 832-0029
                                                                Web site: http://www.rf-controls.com

SASL OVERVIEW

SASL is a multi-protocol, multi-regional Radio Frequency Signal Acquisition & Source Location unit, which is used to Identify and locate RFID tags operating in the UHF 860 – 960 MHz frequency band. A number of **SASL** units may be used together with an **ITCS** Location Processor to form an Intelligent Tracking and Control System (**ITCS**). **SASL** comprises an embedded multi-protocol, multi-regional RFID reader/writer transceiver connected to the patented steerable phased array antenna system. **SASL** is designed to operate from AC mains power and communicates with a host computer using standard Ethernet TCP/IP and UDP protocol. Figure 1 illustrates the two versions of SASL currently available. Both versions are equipped with identical RFID reader and Array Controller.

- ITCS-A-200 is constructed using eight Bi-directional Electronically Steerable Phased Arrays (**BESPA™**) arranged to provide a single array with a circularly polarized gain of 11.6dBi.
- ITCS-A-202 is constructed using four **BESPA**s arranged to provide a single array with a circularly polarized gain of 7.6dBi.

The particular units used in an installation will depend on the system design and determined by a qualified applications engineer. The two models may be intermixed as required in a single ITCS system.
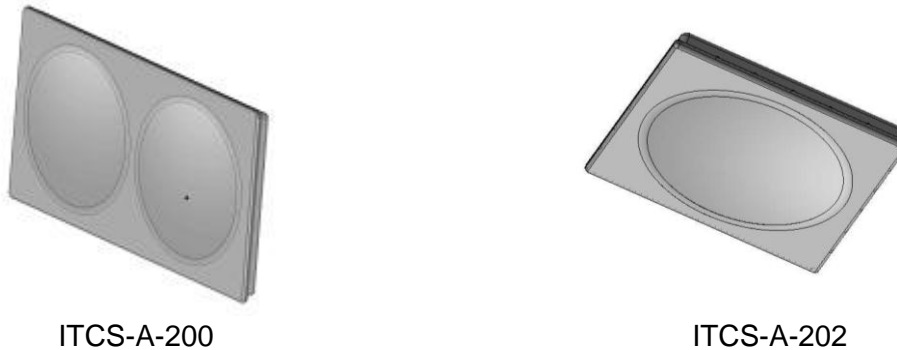
ITCS-A-200   ITCS-A-202

Figure 1
SASL (Signal Acquisition and Source Location) units

INDICATOR LIGHTS

Reader Indicator Lights

The SIRIT INfinity 610 is equipped with four status indicators located on the top of the enclosure. From left to right, these LEDs provide indication according to the following table:

Position Number	Indication	Color/State	Indication
1	Power	Off	Power Off
		Amber	Boot loader executing
		Amber-Flashing	Linux Initializing
		Green	Unit operational
2	Activity	Off	RF Off
		Green	TX Active
		Green-Flash	Tag detect
		Amber	Antenna Check Failed
3	User	Amber	User defined
4	Status	Off	OK
		Amber	Firmware update
		Green-Flash	GPIO activity
		Red	Fault

Note that when the SIRIT reader is performing power on auto-test, the indicator lights will flash momentarily.
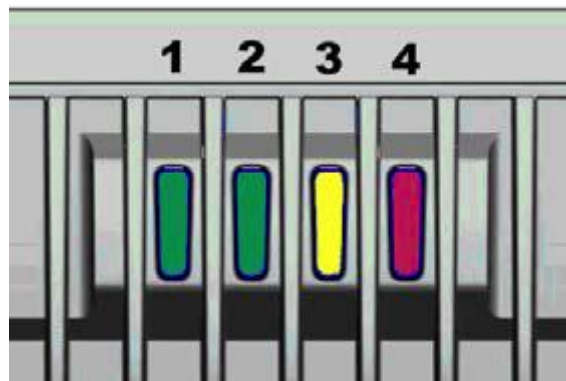

Figure 2
SIRIT RFID Reader Indicator Lights.

Installation

MECHANICAL INSTALLATION

Each model of the ITCS-A-2xx family of SASL units is mounted slightly differently. **SASL** units weigh up to 100 lbs (46.3 kg), so it is important to ensure that the structure, to which the **SASL** is to be attached, is of sufficient strength. The **SASL** may be ceiling mounted, wall mounted or attached to a suitable stand. A safety cable rated at three (3) times the hanging weight of the SASL and associated hardware must be secured to a separate fixture and attached to the **SASL** mounting bracket.

When mounting the **SASL** as a stand-alone unit, make sure that it is mounted the correct way up as indicated by information in the **Technical Manual,** for the specific **SASL**. If the **SASL** is one of several and is part of an **ITCS** network, then orient each **SASL** according to the **ITCS** system installation drawings. If in doubt contact a member of our technical support team.

ITCS-A-200
The ITCS-A-200 **SASL** is provided in its standard configuration with a mounting bracket for installation in a landscape orientation. When mounting the SASL refer to figure 3. Consult the **Technical Manual**, for further information. Contact a member of our technical support team for more information.

ITCS-A-202
The ITCS-A-202 **SASL** is only mounted in a landscape orientation because the array is symmetrical there is no benefit to mounting the array in a portrait fashion. When mounting the SASL refer to figure 3. Consult the **Technical Manual**, for further information. Contact a member of our technical support team for more information.

When mounting the **SASL** as a stand-alone unit, make sure that it is mounted the correct way up as indicated by information in the **Technical Manual,** for the specific **SASL**. If the **SASL** is one of several and is part of an **ITCS** network, then orientate each **SASL** according to the **ITCS** system installation drawings. If in doubt contact a member of our technical support team.

SAFETY WARNING

The ITCS-A-200 **SASL** weighs approximately 100 lbs. (49 kg), and ITCS-A-202 weighs approximately 50 lbs (23kg). These units should only be installed using suitable safety and lifting equipment. Ensure that the wall fixings or mounting hardware is suitably rated.

ELECTRICAL INSTALLATION

Electrical installation requires the connection of two plugs:

AC Mains Input

AC mains input is an IEC connector as shown in figure 3. Connect the provided IEC mains cord to the power supply and plug it in to a suitable mains outlet. Note that the mains outlet must be located in close proximity to the **SASL** and must be accessible to enable easy disconnection of the mains supply to the **SASL** in case of emergency or when servicing. The form and location of the AC mains input is the same on the ITCS-A-200 and ITCS-A-202.

Ethernet

The Ethernet LAN connection uses the industry standard RJ-45 connector. A suitable Ethernet cable fitted with an RJ-45 plug is connected to the **SASL** Array Controller box as shown in figure 3. The **SASL** is factory programmed with a fixed IP address which is shown on the label adjacent to the Ethernet connector. The form and location of the Ethernet connection Input is the same on the ITCS-A-200 and ITCS-A-202.
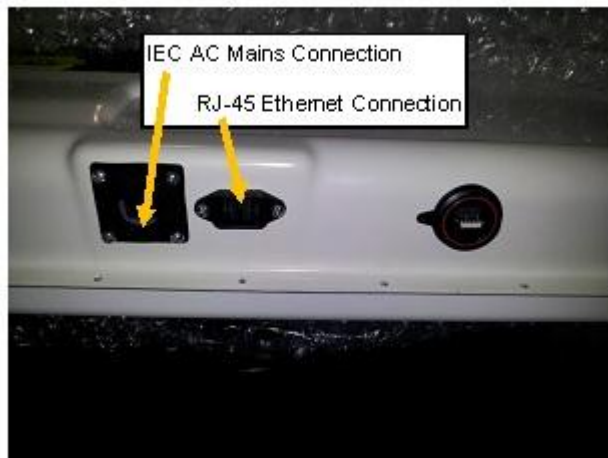

Figure 3
ITCS-A-200 and ITCS-A-202 Power and Ethernet Connections are similar in form and location.

WARNING

The SASL is not user serviceable. Dis-assembly or opening the SASL will cause damage to its operation, will void any warranty and may invalidate the FCC type approval

NON IONIZING RADIATION

This unit incorporates a Radio Frequency Transmitter and should therefore be installed and operated so as to avoid exposure of any persons to unsafe emissions. The FCC requires that any antenna, which includes the **SASL**, be mounted so that a separation distance of at least 23cm is provided from all persons. See *FCC Radiation Exposure Statement* in the Safety Instructions section of this guide.

NOTICE FOR EUROPEAN INSTALLERS

The Installer shall ensure that he is familiar with any restrictions of the local EU Member State on the use of this device and ensure compliance! Examples may include: restrictions on geographic location or only for indoor use etc.
Due to differences between ETSI and FCC frequency bands, "Phase Ranging" Techniques are not available with the ETSI version of the SASL.

USABLE FREQUENCY RANGE IN USA AND CANADA

In USA and Canada this device is factory programmed to operate in ISM 902MHz – 928MHz band

MULTIPLE SASL UNITS CONFIGURED AS AN ITCS

Figure 4 shows how two or more ITCS-A-2xx **SASL** units may be connected via an Ethernet network to an **ITCS** Location Processor. One Location Processor and multiple distributed SASLs operate collaboratively to form RF Controls' Intelligent Tracking and Control System (ITCS™). In this example two **SASL** units have been attached to the network. Combinations of the various model **SASL** units may be mixed and matched as required to suit a particular installation. The RF Controls **Technical Manual** provides details on how to install, configure and calibrate an **ITCS**. The **Programmers Reference Guide** provides details of the Application Program Interface (API) used by the **ITCS**.
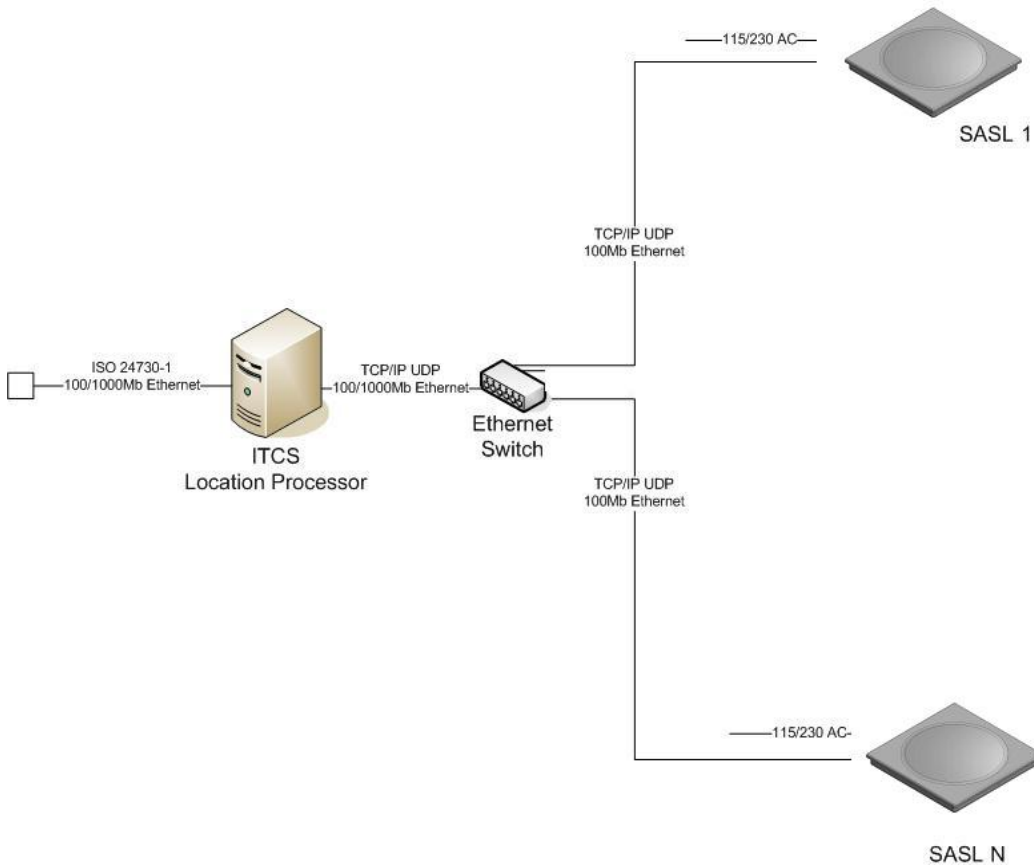

Figure 4
Intelligent Tracking and Control System comprising a number of SASL units connected via an Ethernet Network to an ITCS Location Processor

Software

The **SASL** is provided with a basic test program on a CD, to run on a Microsoft™ Windows® equipped Personal Computer. The program enables you to carry out a number of basic tests.

See the Technical Manual, ITCS-A-100-002 for further instruction on Software usage.

APPLICATION INTERFACE

The **SASL** uses an International Standard, Application Program Interface (API) as defined in ISO/IEC 24730-1. Further details of the API and commands are contained in the **Programmer's Reference Guide.**

Specifications

General	ITCS-A-200	ITCS-A-202
Frequency	UHF band: 860 – 960 MHz[1]	
RF Radiated Output Power	Adjustable from 0.1 to 4 Watts EiRP	
Regulatory Compliance	FCC, CFR47 Part 15.247 EN 302 208, EN 301 489-3, EN 301 489-1, EN55022, EN55024, EN 60950-1:2005	
Reading/writing Protocols	ISO18000-6C / EPC UHF Gen 2 EM 4122 (TTO)	
FCC ID	WFQITCSA200	WFQITCSA202
Application Interface	ISO/IEC 24730-1	

Environmental		
Operating Temperature	+14 to +130 °F (-10 to +55°C)	
Storage Temperature	-40 to +85ºC	
Relative Humidity	5 to 95% non-condensing	
Dimensions	68 x 36 x 5" (170 x 90 x 13 cm))	36in x 36in x 5in (90 x 90 x 13 cm)
Weight	100 lbs (46 kg)	54 lbs (25 kg)

Ethernet LAN		
Connector	RJ-45	
Ethernet	10/100 BaseT	
Indicators	Yellow – link operational Green – network traffic detected	
Signals	Pin 1 TXD+	Pin 5 NC
	Pin 2 TXD -	Pin 6 RXD -
	Pin 3 RXD+	Pin 7 NC
	Pin 4 NC	Pin 8 NC

Power Supply	
Input Connector	IEC/EN 60320 C14
Voltage	90 – 265 Volts AC
Frequency	47 – 63 Hz
Current	3A

Antenna		
Gain[2] (circularly polarized)	11.6 dBi[2]	7.4 dBi[2]

---

[1] The SASL uses the SIRIT INfinity 610 RFID reader which will be factory set at time of shipping, to suit the country of installation and use.
[2] Nominal maximum value. Precise gain depends on transmit frequency

Safety Instructions

This unit emits Radio Frequency non-ionizing radiation. The installer must ensure that the antenna is located or pointed such that it does not create an RF field in excess of that permitted by the Health and Safety Regulations applicable to the country of installation.

Setting RF Output Power
Enter the desired RF output power as a percentage of the maximum power into the Set Power box. Click the **set Power** button. Note: the actual <u>maximum</u> Radiated RF Power is factory set to comply with the radio regulations in the country of use. In the USA and Canada this is 4 Watts EiRP and under EN 302 208 this is 2 Watts ERP (3.2 W EiRP).

FCC Radiation Exposure Statement
The antenna used on this equipment must be installed to provide a separation distance of at least 23cm from all persons and must not be co-located or operated in conjunction with another antenna or transmitter.

FCC Part 15 Notice
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC and Industry Canada Modification Warning Statement
Modification of this device is strictly prohibited. Any modifications to the factory hardware or software settings of this device will void all warranties and be deemed non-compliant with FCC and Industry Canada Regulations.

La modification de ce dispositif est strictement interdite. Toutes les modifications apportées au matériel d'usine ou les paramètres du logiciel de cet appareil annulera toutes les garanties et sera considérée comme non conforme aux normes FCC et d'Industry Canada.

Industry Canada Statement
This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme aux normes d'Industrie Canada exempts de licence RSS (s). Son fonctionnement est soumis aux deux conditions suivantes: (1) cet appareil ne doit pas provoquer d'interférences, et (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent provoquer un fonctionnement non désiré de l'appareil.

Power Disconnect Device
The plug on the power supply cord is intended to be the power disconnect device. The power source (socket or outlet) shall be located near the equipment and shall be easily accessible.

Statement of Compliance with R&TTE directive
RF Controls, LLC hereby declares that it's ITCS-A-200, and ITCS-A-202 products are in compliance with the essential requirements and other relevant provisions of European Directive 1999/5/EC. The original Certificate of Conformity is available at
www.rf-controls.com

RF Controls, LLC
1141 S. 7th Street
St. Louis
MO 63104-3623
USA

Phone:	**+1 314 571 6200**
Fax:	**+1 314 832 0029**
e-mail:	**e-mail: techsupport@rf-controls.com**
Web site:	**http://www.rf-controls.com**