RF CONTROLS

IDENTIFY. LOCATE. TRACK.™

User Guide

SASL™ (Signal Acquisition & Source Location unit)

RF Controls Intelligent Tracking and Control System (ITCS™)

ITCS-A-21X Family SASL Antenna Models

ITCS-A-210
ITCS-A-212

Configured with an RFC-6100XR RFID Reader

Revision History

Change Date Description

1.00- FAE 2013 1st Draft from A-20X Family
1.10- Andrew Crook Add New Reader Figures and Update Company info
1.20- Andrew Crook Change Model Number and revise body
1.30- April 2014 Edit for UL/FCC
1.40- May 2014 Ionizing Distance 23cm

Introduction

This **SASL™ User Guide** provides the basic information needed to install an individual **SASL** antenna unit containing an RFC-6100XR RFID Reader. 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.

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2. Installation
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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
1400 South 3rd Street, Suite 220
Saint Louis, Missouri 63104
USA

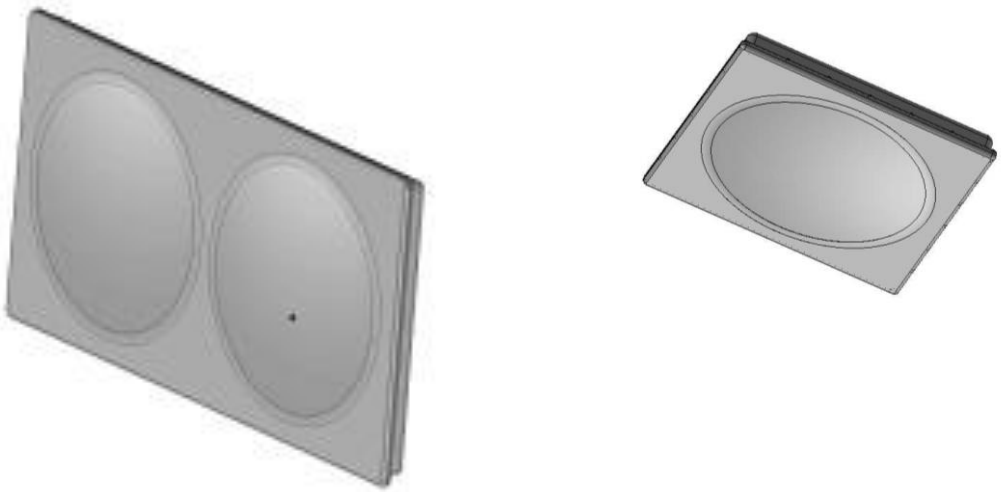
Phone: +1 314 584-1500 +1 314 571-6200
Fax: +1 314 584-1549
Web site: http://www.rfctrls.com e-mail: inquires@rf-controls.com
e-mail: techsupport@rf-controls.com

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 be powered from AC mains or Power-Over-Ethernet and communicates with a host computer using standard Ethernet TCP/IP and UDP protocol. Figure 1 illustrates the Four versions of SASL currently available. All models are equipped with identical Array Controllers. The ITCS-A-210 and ITCS-A-212 contain the RF Controls RFC-6100XR RFID reader.

- ITCS-A-210 are constructed using eight Bi-directional Electronically Steerable Phased Arrays (**BESPA™**) arranged to provide a single array with a circularly polarized gain of more than 10dBi.
- ITCS-A-212 are constructed using four **BESPA**s arranged to provide a single array with a circularly polarized gain of more than 7 dBi.

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-210 ITCS-A-212

Figure 1 SASL (Signal Acquisition and Source Location) Units

INDICATOR LIGHTS

ITCS-A-21X Reader Indicator Lights

The RF Controls RFC-6100XR RFID reader is equipped with four status indicators located on the top of the enclosure. From top to bottom, these LEDs provide indication according to the following table:

Indication	Color/State	Indication
Tag Sense	Off	No Tags Detected
	Blue	Tags Detected
Transmit	Off	RF Off
	Yellow	Transmit Active
Fault	Off	OK
	Red-Flashing	Error/Fault Blink Code
Power	Off	Power Off
	Green	Power On

Note that when the RFC-6100XR reader is performing power on auto-test, the indicator lights will flash momentarily.

Figure 2 RF Controls RFID Reader Indicator Lights.

Installation

MECHANICAL INSTALLATION

Each model of the ITCS-A-21X 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-210
The ITCS-A-210 **SASL** is provided in its standard configuration with a mounting bracket for installation in a landscape orientation. When mounting the SASL refer to Figure 4. Consult the **Technical Manual**, for further information. Contact a member of our technical support team for more information.

ITCS-A-212
The ITCS-A-212 **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 4. 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.

AVERTISSEMENT DE SÉCURITÉ
ITCS-A-200 SASL pèse environ 49 kg, et des ITCS-A-202 pèse environ 23 kg. Ces unités ne doivent être installés à l'aide des équipements de sécurité et de levage approprié. Veiller à ce que les fixations murales ou le matériel de montage est convenablement évalués.

ELECTRICAL INSTALLATION

POE Power Input

POE power input is available only for the ITCS-A-210 and ITCS-A-212 using the RJ-45 connector as shown in Figure 4. Connect POE power supply and plug it in to a suitable mains outlet and the POE Bias T. POE power, DC Input equivalent to IEEE 802.3at. Note that the power for the POE bias T should be located in close proximity to the **SASL** and should be accessible to enable easy disconnection of the power to the **SASL** in case of emergency or when servicing.

AC Mains Input

AC mains input is an IEC connector as shown in Figure 4. 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-210 and ITCS-A-212.

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 4. 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-210 and ITCS-A-212.

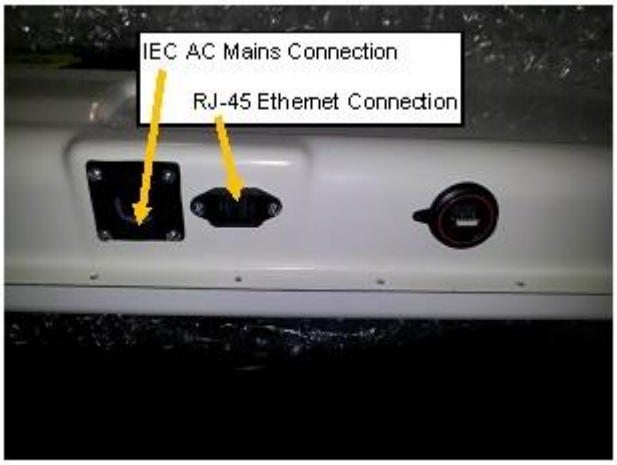


Figure 4

ITCS-A-210 and ITCS-A-212 Power and Ethernet Connections are similar in form and location.

WARNING
The SASL is not user serviceable. Disassembly 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. A minimum separation distance of 23cm must be maintained at all times between antenna and 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 US 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 5 shows how two or more ITCS-A-21X **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**.

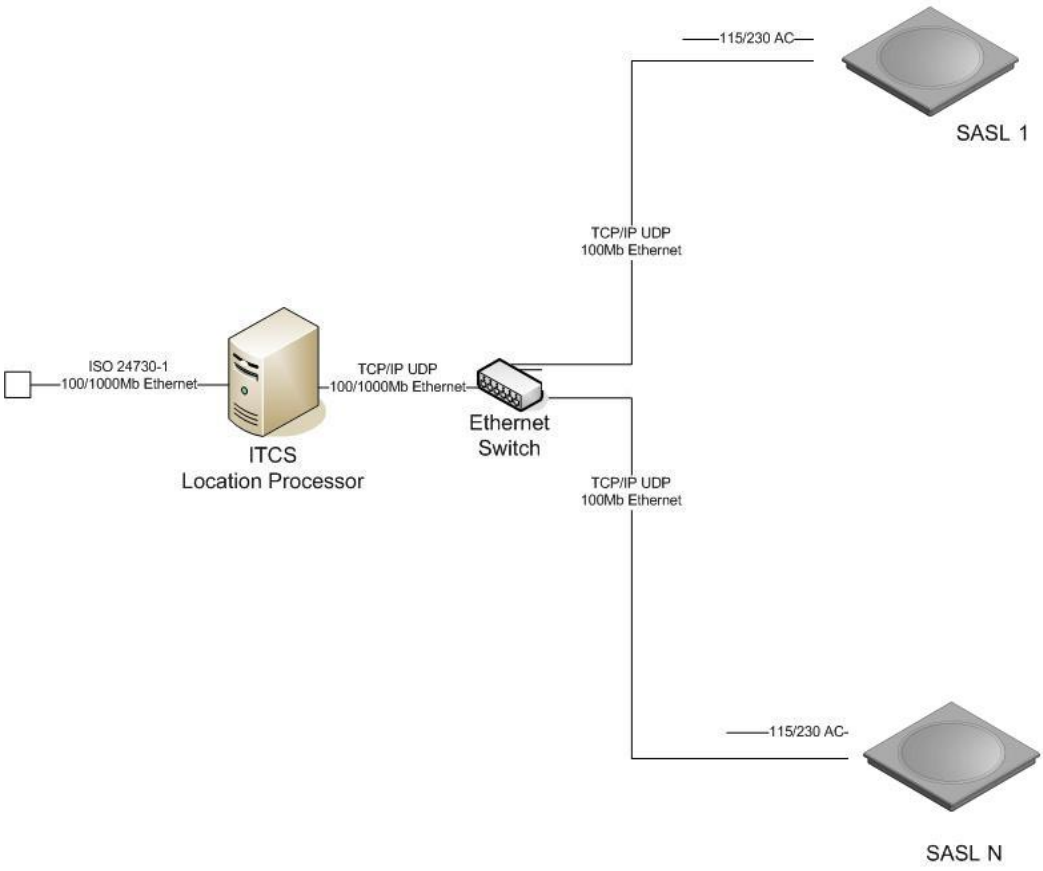


Figure 5
Intelligent Tracking and Control System comprising a number of SASL units connected via an Ethernet Network to an ITCS Location Processor

Software

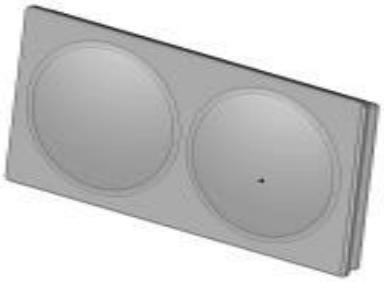
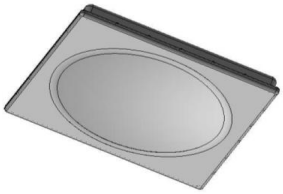
The **SASL** is provided with a basic test program on a CD, to run on a Microsoft™ Windows® equipped Personal Computer. The program enables you to carry out a number of basic tests.

See the **Technical Manual** 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-210	ITCS-A-212
		
Frequency	UHF band: 860 – 960 MHz[1]	
RF Radiated Output Power	Adjustable from 0.2 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 IC ID	WFQRFC-6100XR 10717A-RFC6100XR	
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	68in x 36in x 5in (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	AC Mains Input	POE DC Input IEEE 802.3at
Input Connector	IEC/EN 60320 C14	RJ-45
Voltage	90 – 265 Volts AC	+48V
Frequency	47 – 63 Hz	DC
Current	3A	0.7A

Antenna		
Gain[2] (circularly polarized)	TBD dBi[2]	TBD dBi[2]

[1] The SASL uses the RFC RFC-6100XR RFID reader which will be factory set at time of shipping, to suit the country of installation and use.
[2] To Be Determined at test. Nominal maximum value. Precise gain depends on transmit frequency

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.

Cet appareil émet Radio Fréquence rayonnements non ionisants. L'installateur doit s'assurer que l'antenne est située ou orientée de façon à ne pas créer un champ RF supérieure à celle permise par le Règlement sur la santé et applicable dans le pays d' 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 maximum 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).

Entrer la puissance de sortie RF souhaité sous forme d' un pourcentage de la puissance maximale dans la zone d'alimentation Set. Cliquez sur le bouton **ensemble d'alimentation** . Remarque: le maximum réel rayonnée de puissance RF est réglé en usine pour se conformer à la réglementation de radio dans le pays d'utilisation. Aux Etats-Unis et au Canada c'est 4 Watts EiRP et selon la norme EN 302 208 c'est 2 watts (3,2 W PIRE).

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.

L'antenne utilisée sur cet équipement doit être installé pour fournir une distance de séparation d'au moins 23cm de toutes les personnes et ne doit pas être co- implantés ou exploités conjointement avec une autre antenne ou émetteur .

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(s) RSS. 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.

La fiche du cordon d'alimentation est destiné à être le dispositif de coupure de courant. La source d'alimentation (prise ou sortie) doit être située près de l'équipement et doit être facilement 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

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RF Controls, LLC
1400 South 3rd Street, Suite 220
Saint Louis, MO 63104-4430
USA

Phone: **+1 314 584-1500** **+1 314 571-6200**
Fax: **+1 314 584-1549**
e-mail: **techsupport@rf-controls.com**
Web site: **http://www.rfctrls.com** **e-mail: inquires@rf-controls.com**