



CE

Operating Manual

iCITE100



II 2 G Ex emb II T4

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Extronics reserve the right to change this manual and its contents without notice, the latest version applies.

Contents

1	Introduction.....	4
2	Safety Information and Notes	5
2.1	Storage of this Manual	5
2.2	List of Notes	5
3	Structure and Function	7
3.1	Applications.....	7
3.2	Features and Benefits	7
3.3	iCITE100 Configuration Methods	9
4	Installation and Setting-to-Work	11
4.1	Installation	11
4.1.1	Removing the cover	11
4.1.2	Installing Cables For Master iCITE100.....	13
4.1.3	Installing Cables For Slave iCITE100.....	16
4.2	Setting to Work.....	19
4.3	Intended Purpose Usage.....	20
4.4	Transportation and Storage.....	20
4.5	Authorized Persons	20
4.6	Cleaning and Maintenance.....	20
4.7	Safety Precautions	21
4.8	Cleaning and Maintenance Intervals	21
4.9	Aggressive substances and environments	21
4.10	Exposure to external stresses	21
5	Technical Data	22
5.1	Specification.....	22
6	Certification	23
7	Manual Revision.....	24

1 Introduction

The Extronics iCITE100 is a Zone 1 approved version of the AeroScout EX2000 which is a hardware component of AeroScout's industry-leading visibility system for active RFID and location applications. The iCITE100 adds value by extending the system to provide robust and sophisticated RFID detection and identification capabilities, using the same Wi-Fi-based Active RFID tags that can also be accurately located in real time by the AeroScout system.

The iCITE100 uses a 125KHz ASK modulated field to trigger Extronics iTAG100 devices as they come within range of the iCITE100 field. This causes the tags to transmit a 2.4GHz WIFI message that is received by a Location Receiver or compatible access point. This provides instant knowledge that a tagged asset or person passed through a gate, doorway or some other tightly defined area.

There are two variants of the iCITE100; master and slave. The master unit may be operated in stand-alone mode, supplied either by IEEE802.3af compliant power-over-Ethernet (POE) or from a 24VAC/DC supply. The master unit communicates with the AeroScout software via 10/100BASET Ethernet.

The slave unit must be connected to a master unit, as it is powered from the master and also receives synchronisation data via RS485. Up to three slave units may 'chained' in series from one master unit. The slave units are used to extend the range of a master unit, for example to reach both sides of a large doorway.

The iCITE100 is marked as **EEx II 2 G Ex emb II T4 -20°C ≤ Tamb ≤ 60°C**

2 Safety Information and Notes

2.1 Storage of this Manual

Keep this user manual safe and in the vicinity of the device. All persons who have to work on or with the device should be advised on where the manual is stored.

2.2 List of Notes

The notes supplied in this chapter provide information on the following.

- **Danger / Warning.**
 - Possible hazard to life or health.
- **Caution**
 - Possible damage to property.
- **Important**
 - Possible damage to enclosure, device or associated equipment.
- **Information**
 - Notes on the optimum use of the device

Warning	Please read EC type certificate Baseefa07ATEX0181X and this manual before installing the iCITE100
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Warning	Installation and maintenance of the iCITE100 must only be carried out by suitably qualified personnel. The equipment must be installed in accordance with EN60079-0, EN60079-14 and the Accident Prevention Regulations.
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Warning	Never connect a supply of more than 24VDC/24VAC to the Auxiliary supply inputs of the master unit.
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Warning	Never connect a slave unit to a master unit which is powered via PoE or a 48V supply.
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Warning	Never connect a slave unit to anything except a master unit or another slave unit.
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Warning	Always follow the connection diagrams in the manual.
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Warning	All cables connected to the iCITE100 to be installed using the correct Ex e e cable glands, to be fitted by a competent person.
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Warning The user **MUST** ensure that any cables connected to the iCITE100 have adequate mechanical protection to avoid damage to the wires. Failure to do so could cause shorts or exposure of non-insulated wires to potentially explosive environments.

Warning Any cable glands which are not in use **MUST** be replaced by a suitable EX e certified stopping plug.

Important Ensure the lid is secure, correct cable glands are fitted and the unit is correctly wired and earthed before applying power to the iCITE100.

Important Slave units cannot be powered via PoE. Slave units can be connected to a master unit (providing the master unit is powered via 24V ac/dc), or to another slave unit.

Important The master and slave iCITE100s have different terminal connections. Follow the correct pin connections for the unit being installed.

3 Structure and Function

3.1 Applications

Theft Prevention and Security

Facilities and general enterprises can tag valuable assets that are intended to stay within a certain area. The system can track the location of those assets, and if they leave through an exit or enter a restricted area, the iCITE100 will trigger an alert.

Process Control

Manufacturing and supply chain facilities can track the location and presence of equipment and in process inventory as it moves through the production process. This gives an enterprise a real-time view of which (and how many) assets have passed each step in the process, enabling better supply chain management.

Reduced Searching Time

The iCITE100 can identify an individual asset among many similar assets, such as WIP items on a shelf in manufacturing, or hospital infusion pumps in a storage room. The person initiating the search will not only know the location of the asset, but can also make the tag physically identify itself by triggering the LED on the desired tag.

Inventory Management

Logistics and manufacturing enterprises can automatically up-date inventory records based on assets currently within defined areas, ensuring real-time knowledge of levels without manual checks or physical scanning.

Business Event Automation

Any type of enterprise can use the iCITE100 to trigger automated events and alerts that occur based on the location of an asset. For example, when a set number of pieces of inventory pass by an iCITE100 to enter a processing area, the floor supervisor can receive a pager alert to redistribute staff to that area.

3.2 Features and Benefits

Long Range RFID Detection of Extronics iTAG100 Tags

The iCITE100 triggers the iTAG100 causing them to transmit as they pass through a defined area. ICITE100 have up to a 6m (20 ft) range, enough to cover wide gate areas, and can also be adjusted to cover areas as small as 50cm (20 inches)

Highly Accurate location Detection

The iCITE100 enables enterprises to locate assets precisely to a specific shelf, rack, workstation (in manufacturing) or bed (in healthcare). In addition the iCITE100 can assist in difficult searches by distinguishing between similar nearby assets, and making the right tag identify itself by blinking.

Tag Behaviour Modification

The iCITE100 can activate and deactivate iTAG100s, extending a tags battery life further by switching them off when they leave a defined tracking area. It can change of tag transmission rate and other tag programming for a temporary or indefinite time to accommodate different usage patterns.

Telemetry and Data Functions

These functions provide the ability to use an iCITE100 to store messages on the tag for later transmission. Message transmission can later be triggered by another iCITE100, enabling sophisticated process control functions. The iCITE100 can trigger a tag to store and transmit up to ten bytes of data.

Rugged IP66-Eated Enclosure

This allows the iCITE100 to be used in any hostile indoor or outdoor environment and in a wide temperature range.

iCITE100 Chaining

Chaining enables multiple iCITE100 units to be connected together for full, precise coverage of areas such as large doorways. Up to three slave units may be daisy-chained from one master unit using 4-pair CAT5 cable.

3.3 iCITE100 Configurations

The iCITE100 can be set up in the following ways:

Connection Method	Description
Single iCITE100 – not connected to network	The iCITE100 can be used as standalone device which functions independently without any network connection. In this case you need to connect the iCITE100 to the power supply only.
Single iCITE100 – connected to network	The iCITE100 can be remotely controller (for configuration and monitoring purposes) through the local area network. In this case you need to connect it to both a power source and the network. The iCITE100 also supports power-over-Ethernet (PoE), which supplies both power and network services via a single connection.
Chained iCITE100s – not connected to network	iCITE100s may be connected to each other in a chain and receive the power/data from one Master iCITE100 in the chain. This configuration does not require any network connectivity. Up to 3 Slave iCITE100s can use the same power source (24V AC/DC only)
Chained iCITE100s – connected to network.	As per chained iCITE100s but master is connected to Ethernet (data only, POE not supported).

Table 3.1 – iCITE100 Configuration Methods

Warning **NEVER connect a supply of more than 24VDC/24VAC to the Auxiliary supply inputs of the master unit.**

Important **Slave units cannot be powered via PoE. Slave units can be connected to a master unit (providing the master unit is powered via 24V ac/dc), or to another slave unit.**

The iCITE100 is configured using the AeroScout® System Manager, once configured the iCITE100 no longer needs to be connected to a LAN. If however, you wish to monitor or configure the iCITE100 while it is in the field then it will need to be connected a LAN. The slave units are automatically updated by the master unit.

Information Consult with the AeroScout® System Manager documentation for information on configuring the iCITE100's software features. This manual only concerns the mechanical and wiring setup of the iCITE100's.

When operating as a single iCITE100 the following configuration methods are possible; if updating and monitoring of the units is required, the master can be connected to a LAN, and powered via either a PoE connection or an external 24V ac/dc power supply as shown in Figure 3.1.

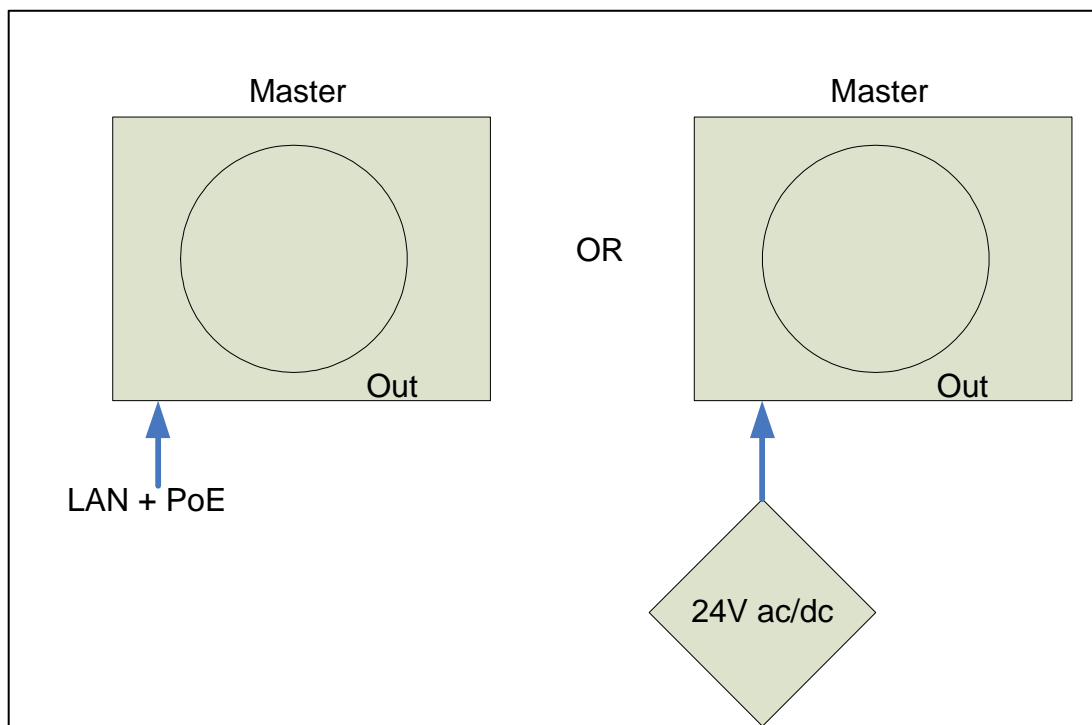


Figure 3.1 – Master iCITE100 Configurations

A master unit can support up to three slave units from a single 24V ac/dc power supply. The slaves are powered using a RS485 connection. In this configuration the last slave in the chain needs to be terminated, as described in section 4.1.3.

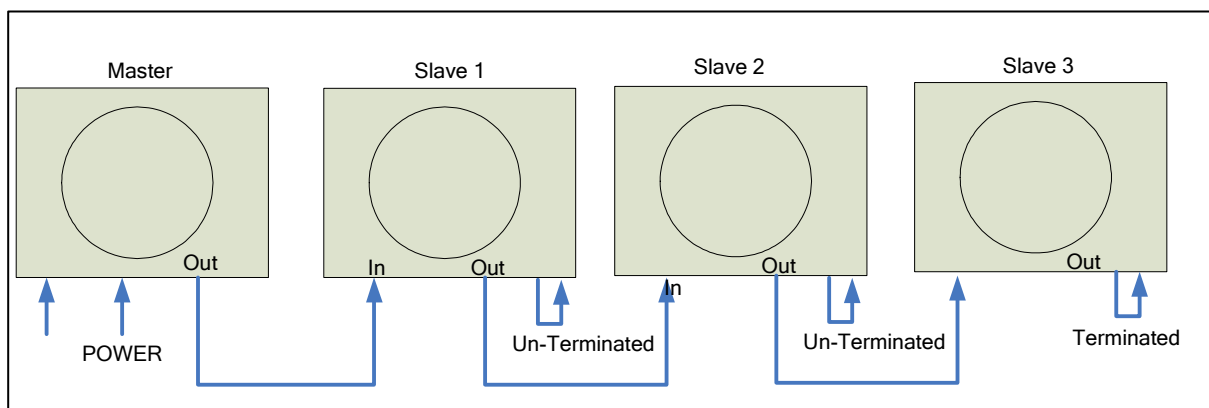


Figure 3.2 – Master-Slave-Slave iCITE100 Configuration

4 Installation and Setting-to-Work

4.1 Installation

The iCITE100 is simple to install and can be secured directly to a suitable surface using the mounting holes on the enclosure

Important All cables connected to the iCITE100 to be installed using the correct Ex e cable glands, to be fitted by a competent person.

4.1.1 Removing the cover

Using a 5mm Allen key unscrew all four screws located in the corners of the box as indicated below in Figure 4.1. (Note that these are captive screws that are retained in the lid).



Figure 4.1 – iCITE100 Enclosure access screw locations

After removing the cover the iCITE100 antenna and screw terminals will be exposed. You will need to remove the antenna to gain access to the Ex e screw terminals. To do this remove the 4 bolts as indicated in Figure 4.2 and carefully lift the antenna off the screw pillars. The antenna will come pre installed, when removing the antenna, be careful not to put a strain on the wires connected to the antenna. It is not necessary to remove the wires connecting the antenna to the PCB from the screw terminals to complete installation.

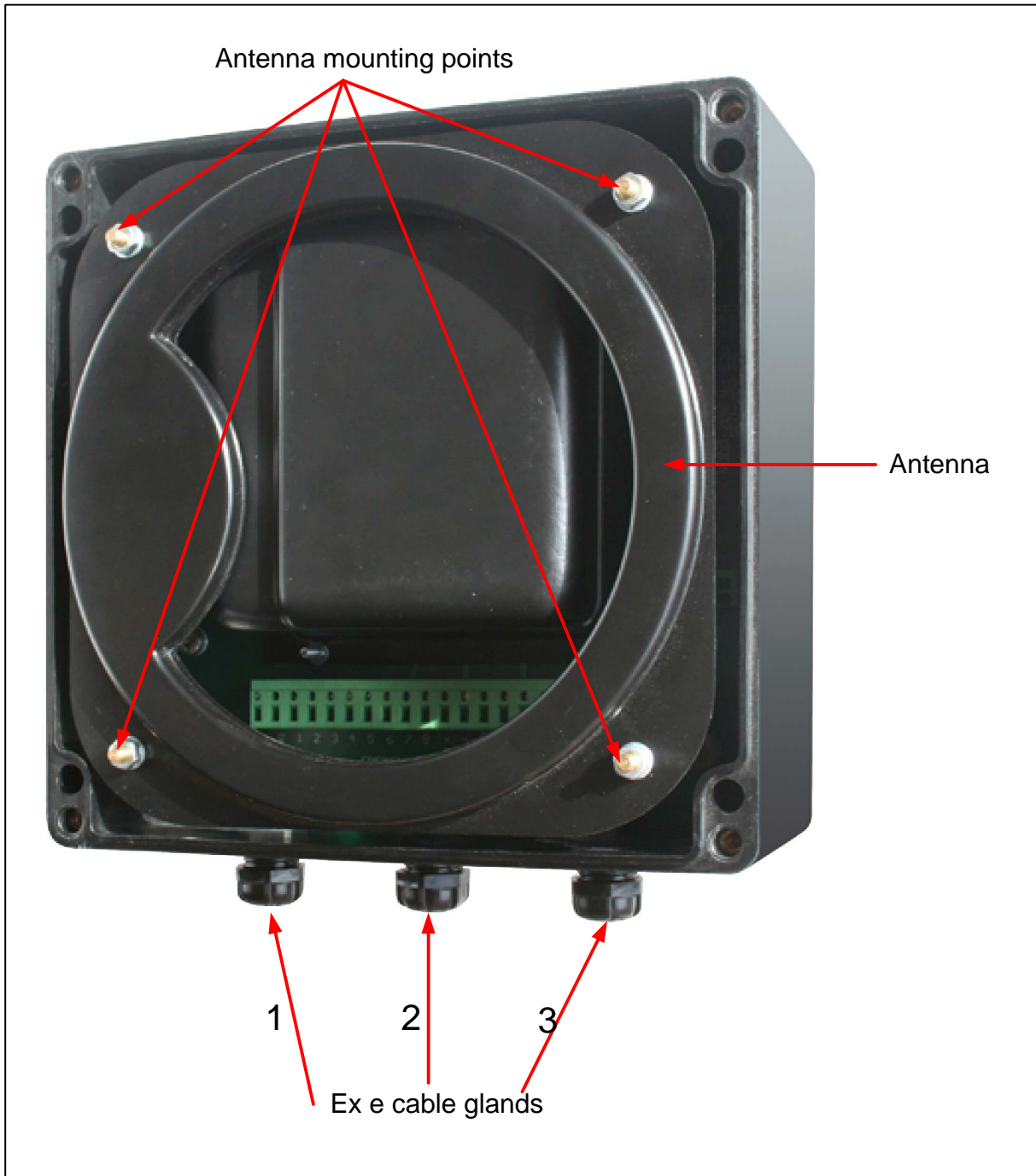


Figure 4.2 – View of iCITE100 with Enclosure Lid Removed

Table 4.1 below describes which wire each cable gland should be used for. If one of the cables is not required due to the configuration required the cable gland(s) not in use must be replaced with a suitably certified stopping plug.

Gland	Master Purpose	Slave Purpose
1	Ethernet	RS485 In
2	External Power In	RS485 Out
3	RS485 Out	Not used stopping plug fitted

Table 4.1 – Cable to Gland Descriptions

Important The master and slave iCITE100s have different terminal connections. Follow the correct pin connections for the unit being installed.

To identify the master and slave versions, look at the screw terminals. There is a row of 21 terminals on the master version, whilst the slave has a row of 25.

4.1.2 Installing Cables For Master iCITE100

Warning The user **MUST** ensure that any cables connected to the iCITE100 have adequate mechanical protection to avoid damage to the wires. Failure to do so could cause shorts or exposure of non-insulated wires to potentially explosive environments.

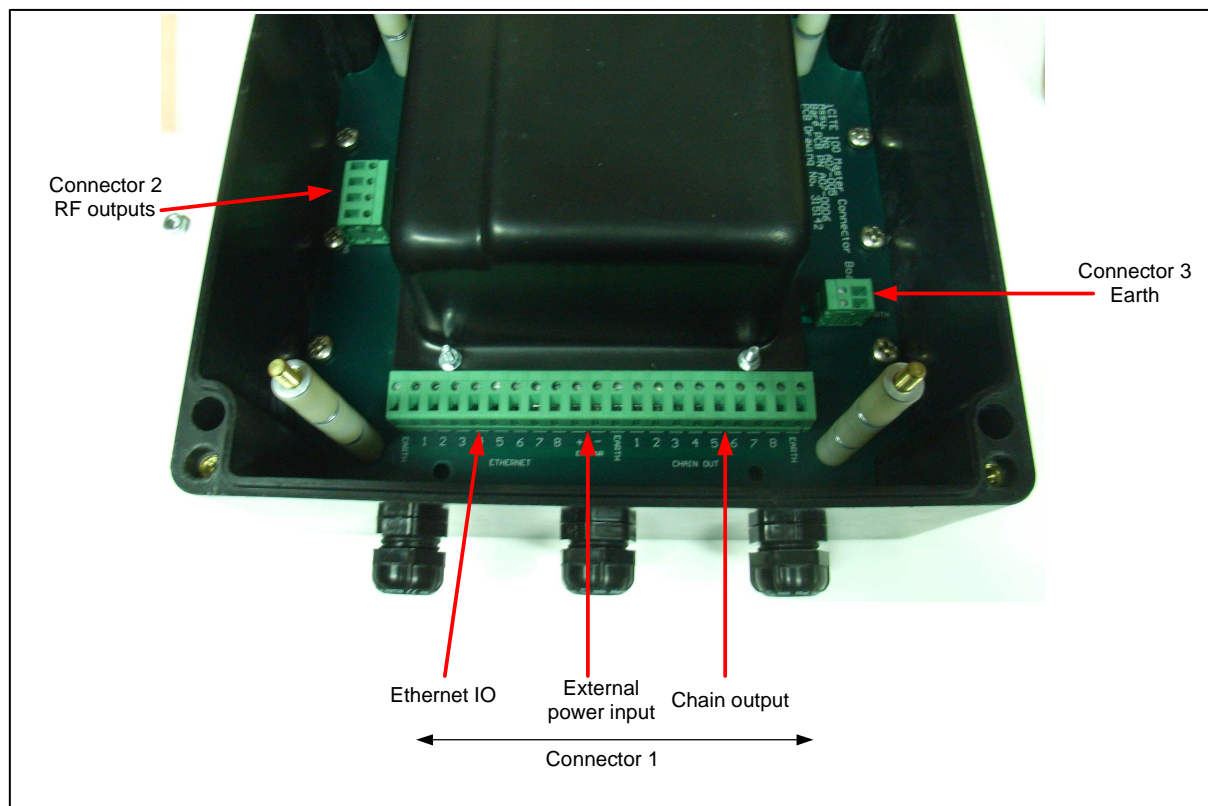


Figure 4.3 – View of iCITE100 Master Unit Screw Terminals

Depending on the configuration required there may be stopping plugs instead of cable glands in the enclosure. For example if the unit is to be used as a single iCITE100 with no Ethernet connection, only a power supply will be needed. Therefore only the middle cable gland will be needed and the other 2 glands will be replaced with stopping plugs.

Warning Any cable glands which are not in use **MUST** be replaced by a suitable EX e certified stopping plug.

Ethernet and RS485 connections should be made using Cat-5 cables, the diagram below shows the pin/wire connections of a typical Cat-5 cable once stripped.

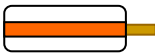



Cat-5 Wire	Colour
1	 White/Orange
2	 Orange
3	 White/green
4	 Blue
5	 White/blue
6	 Green
7	 White/brown
8	 Brown

Table 4.2 - Cat-5 Cable Wiring Descriptions

Ethernet Connection

To connect a Cat-5 cable to the Ethernet screw terminals, feed the cable through the left-most cable gland and strip the wire to expose the 8 individual wire cores as describes above in table 4.2 and also the outer sheath. Terminate the wires and outer sheath in bootlace ferrules. The earth wire should be sleeved. Place the correct wires into the corresponding screw terminal, i.e. cat-5 wire 1 into Ethernet – 1 and cat-5 wire 8 into Ethernet – 8. Place the terminated outer sheath into the earth terminal C1-21. Ensure the wires are securely screwed into place.

Power Connection

If the iCITE100 is to be powered via an external power source, ensure the power supply is 24V ac/dc only. Feed the cable through the middle cable gland and strip the wire to expose the two power lines and the outer sheath, then strip and terminate the exposed wires with bootlace ferrules. The earth wire should be sleeved. Place the wires into the corresponding screw terminal as indicated in below in table 4.3. The earth wire should be placed into screw terminal C1 – 10. Ensure the wires are securely screwed in place.

RS485 Connection

If the iCITE100s are to be used in chained mode the RS485 Out pins on the master unit (connector 1) will be used to connect the first slave unit. The RS485 connection should also be made using a Cat-5 cable. Feed the cable through the right hand cable gland, then strip and terminate the wires with bootlace ferrules. The earth wire should be sleeved. Place the outer sheath into the earth terminal C1-1 and the corresponding cat-5 wires into the RS485 screw terminal as described below in table 4.3, i.e. Cat-5 wire 1 into RS485 – 1. Ensure the wires are securely screwed in place.

Earthing

Connector 3 contains two earth screw terminals which are to be used to earth the iCITE100. Connect one of the earth terminals to the earthing lug connected to the iCITE100's enclosure. The second screw terminal for earth is a spare; you can use this should you have any extra wires which need earthing from the power supply for example.

Master Connector/Pin No.	Pin Description
C1 - 1	Earth (RS485)
C1 - 2	RS485 Out – 8
C1 - 3	RS485 Out – 7
C1 - 4	RS485 Out – 6
C1 - 5	RS485 Out – 5
C1 - 6	RS485 Out – 4
C1 - 7	RS485 Out – 3
C1 - 8	RS485 Out – 2
C1 - 9	RS485 Out – 1
C1 - 10	Earth (Power cable outer sheath)
C1 - 11	External Power -
C1 - 12	External Power +
C1 - 13	Ethernet – 8
C1 - 14	Ethernet – 7
C1 - 15	Ethernet – 6
C1 - 16	Ethernet – 5
C1 - 17	Ethernet – 4
C1 - 18	Ethernet – 3
C1 - 19	Ethernet – 2
C1 - 20	Ethernet – 1
C1 - 21	Earth (Ethernet)
C2 - 1	Long-Range Antenna +
C2 - 2	Long-Range Antenna -
C2 - 3	Short-Range Antenna +
C2 - 4	Short-Range Antenna -
C3 - 1	Earth
C3 - 2	Earth

Table 4.3 – Master iCITE100 Screw Terminals Description

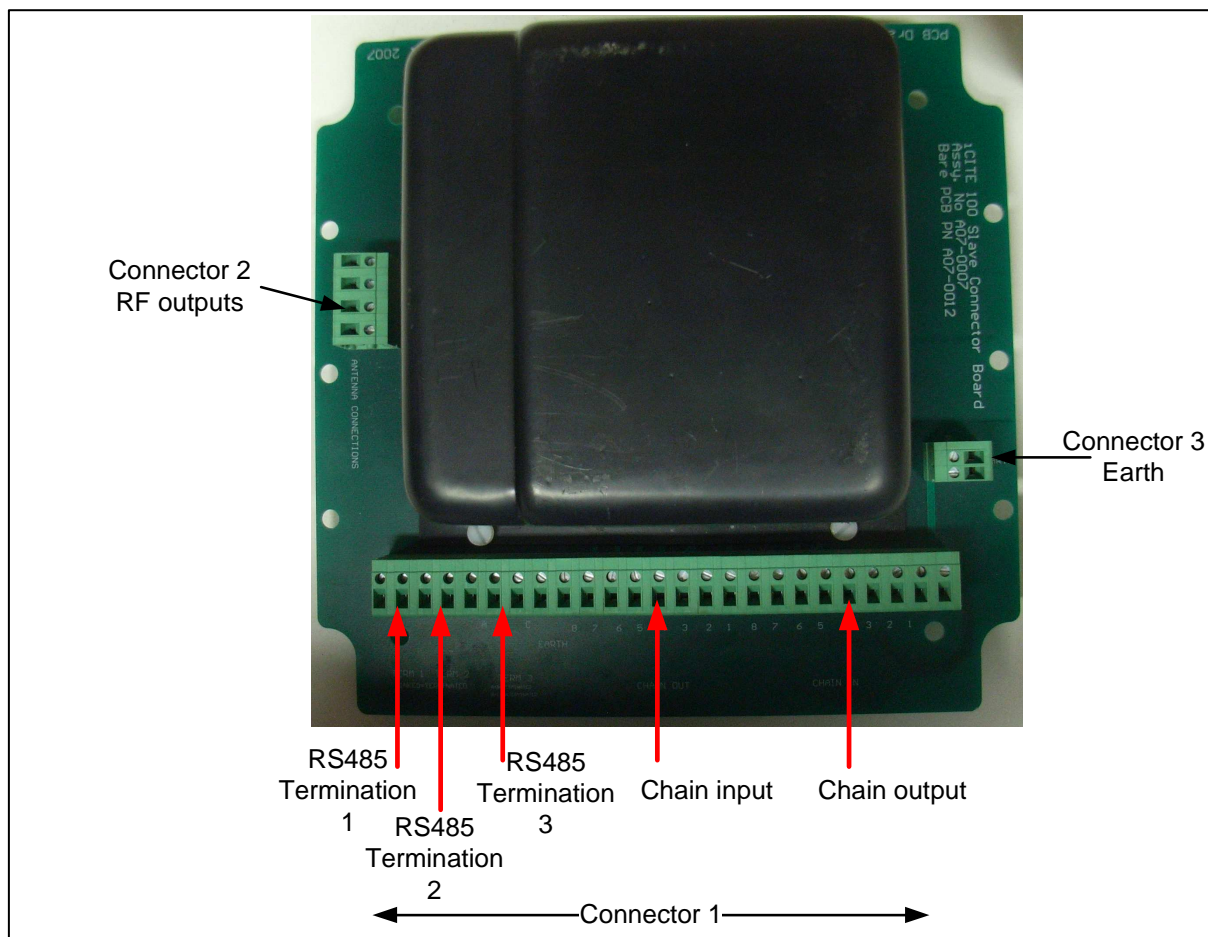


Figure 4.4 – View of iCITE100 Slave Unit Screw Terminals

4.1.3 Installing Cables For Slave iCITE100

The slave iCITE100's are powered and controlled via a master unit. RS485 is fed into a slave unit from a master unit. It is possible to have 2 slave units attached to a master unit in a chain. The first slave will accept an RS485 input from the master, this unit will then send an RS485 output to the input of the second slave unit. The last slave in the chain will then need to be terminated for the chain to work correctly.

RS485 In Connection

RS485 in pins on connector 1 will be used to connect the unit to either a master or another slave unit's RS485 out terminals. The RS485 connection should be made using a cat-5 cable. Feed the cable through the left hand cable gland, then strip and terminate the wires with bootlace ferrules. The earth wire should be sleeved. Place the outer sheath into the earth terminal C1-1 and the corresponding cat-5 wires into the RS485 screw terminal as described below in table 4.5, i.e. cat-5 wire 1 into RS485 In – 1. Ensure the wires are securely screwed in place.

RS485 Out Connection

If another slave is to be connected to the RS485 Out pins on connector 1 will be used to connect the second slave unit. The RS485 connection should also be made using

a cat-5 cable. Feed the cable through the right hand cable gland, then strip and terminate the wires with bootlace ferrules. The earth wire should be sleeved. Place the outer sheath into the earth terminal C1-18 and the corresponding cat-5 wires into the RS485 Out screw terminal as described below in table 4.5, i.e. cat-5 wire 1 into RS485 out – 1. Ensure the wires are securely screwed in place.

Termination Jumper Setup

The last slave in a chain needs to be terminated. Therefore if only one slave is used this slave automatically needs to be terminated. If two slaves are used the second slave needs to be terminated and the first slave needs to remain un-terminated. Termination is applied to a slave unit by setting jumpers between the termination terminals on connector 1 accordingly. The table below describes if the termination methods required for various configurations.

Using table 4.4, setup the slave units as required, using suitable wire crimped and securely screwed in place.

Configuration	Termination Required?	Term1-Term2 Configuration	Term3 configuration
Master-Slave1	Yes slave1	Not Linked	A + B
Master-Slave1-Slave2	No-Slave1 Yes-Slave2	Slave1 – Not Linked Slave2 – Linked	Slave1 - B+C Slave2 – A+B
Master-Slave1-Slave2-Slave 3	No-Slave1, Slave 2 Yes- Slave3	Slave1 – Not Linked Slave2 – Not Linked Slave 3 – Linked	Slave1 - B+C Slave 2 – B+C Slave 3 – A+B

Table 4.4 – Termination Jumper Setting Configuration.

Earthing

Connector 3 contains two earth screw terminals which are to be used to earth the iCITE100. Connect one of the earth terminals to the earthing lug connected to the iCITE100's enclosure. The second screw terminal for earth is a spare; you can use this should you have any extra wires which need earthing from the power supply for example.

The following table provides slave screw terminal descriptions.

Slave Connector/Pin No.	Pin Name
C1 - 1	Earth
C1 - 2	RS485 Input – 1
C1 - 3	RS485 Input – 2
C1 - 4	RS485 Input – 3
C1 - 5	RS485 Input – 4
C1 - 6	RS485 Input – 5
C1 - 7	RS485 Input – 6
C1 - 8	RS485 Input – 7
C1 - 9	RS485 Input – 8
C1 - 10	RS485 Output – 1
C1 - 11	RS485 Output – 2
C1 - 12	RS485 Output – 3
C1 - 13	RS485 Output – 4
C1 - 14	RS485 Output – 5
C1 - 15	RS485 Output – 6
C1 - 16	RS485 Output – 7
C1 - 17	RS485 Output – 8
C1 - 18	Earth
C1 - 19	Term3C
C1 - 20	Term3B
C1 - 21	Term3A
C1 - 22	Term2B
C1 - 23	Term2A
C1 - 24	Term1B
C1 - 25	Term1A
C2 - 1	Long-Range Antenna +
C2 - 2	Long-Range Antenna -
C2 - 3	Short-Range Antenna +
C2 - 4	Short-Range Antenna -
C3 - 1	Earth
C3 - 2	Earth

Table 4.5 – Slave iCITE100 Screw Terminal Descriptions

4.2 Setting to Work

Once all cables have been connected, place the antenna back over the pillars in the same orientation as in figure 4.2. Securely fasten the antenna using the washers and bolts. Refit the enclosure lid and securely tighten the screws making sure not to over tighten them.

Important	Ensure the lid is secure, correct cable glands are fitted and the unit is correctly wired and earthed before applying power to the iCITE100
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4.3 Intended Purpose Usage

Important	Before setting the units to work, read the technical documentation carefully.
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Important	The latest version of the technical documentation or the corresponding technical supplements is valid in each case.
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The iCITE100 is built using modern components and is extremely reliable in operation; however it must only be used for its intended purpose. Please note that the intended purpose also includes compliance with the instructions issued by the manufacturer for installation, setting up and service.

Any other use is regarded as conflicting with the intended purpose. The manufacturer is not liable for any subsequent damage resulting from such inadmissible use. The user bears the sole risk in such cases.

4.4 Transportation and Storage

All iCITE100 devices must be so transported and stored that they are not subjected to any excessive mechanical stresses.

4.5 Authorized Persons

Only persons trained for the purpose are authorized to handle the iCITE100; they must be familiar with the unit and must be aware of the regulation and provisions required for explosion protection as well as the relevant accident prevention regulations.

4.6 Cleaning and Maintenance

The iCITE100 and all its components require no maintenance. All work on the iCITE100 by personnel who are not expressly qualified for such activities will cause the Ex approval and the guarantee to become void.

4.7 Safety Precautions

Important	For the installation, maintenance and cleaning of the units, it is absolutely necessary to observe the applicable regulations and provisions concerned with explosion protection (EN 50014, EN 60079-14:2003) as well as the Accident Prevention Regulations.
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4.8 Cleaning and Maintenance Intervals

The cleaning intervals depend on the environment where the system is installed.

4.9 Aggressive substances and environments

The iCITE100 is not designed to come into contact with aggressive substances or environments, please be aware that additional protection may be required.

4.10 Exposure to external stresses

The iCITE100 is not designed to be subjected to excessive stresses e.g. vibration, heat, impact. Additional protection is required to protect against these external stresses.

The iCITE100 will require additional protection if it is installed in a location where it may be subjected to damage.

5 Technical Data

5.1 Specification

Range	Adjustable from 50 centimetres to 6.5 metres (20 inches to 21 feet)
Tag Type	Extronics iTAG100 tags
Dimensions	250 x 250 x 120 mm (w x h x d) 9.85 x 9.85 x 4.72 inches
Weight	Approx 2.5 Kg (5.5 lbs)
Ambient Temperature	-20°C to +60°C (-4°F to +140°F)
Relative humidity	0 to 95%, non-condensing
Housing	Black antistatic GRP enclosure
Ingress Protection	IP66
Electrical Connection	Screw terminals
Cable Entry	3 x M20 Ex e compression glands
Mounting	Wall or ceiling
Management	Settings configured remotely using Aeroscout System Manager Software
LF Channel	125KHz ASK modulation
Field Intensity Limits (ETSI)	37.3 dBµA/m at 10m
Propagation Limits (FCC)	21.8 dBµV/m at 10m
Radio Certification	FCC Part 15, sub part C class B, sub part B, EN300-330, EN301-489, RSS 210 (Canada)
Safety Certification	CE, cTUVus (EN60950) ATEX II 2 G Ex emb II T4

6 Certification

EC Declaration of Conformity



We hereby confirm the conformity of the equipment listed below with the directives of the Council of the European Community. The safety and installation instructions of the product documentation must be observed.

Model: **iCITE100**

Directive: 94/9/EC (ATEX)

European standard: EN 60097-0: 2006, EN 60079-7: 2007, EN60079-18: 2004

Directive: 93/465/EC (EMC)

European standard: EN55022:2006, EN55024, EN 61000-3-2, EN6100-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6

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7 Manual Revision

Revision	Description	Date	By
01	Current revision	07/12/2007	AJR
02	Image Updated	27/03/2009	JRE