IRIS Configuration Manual
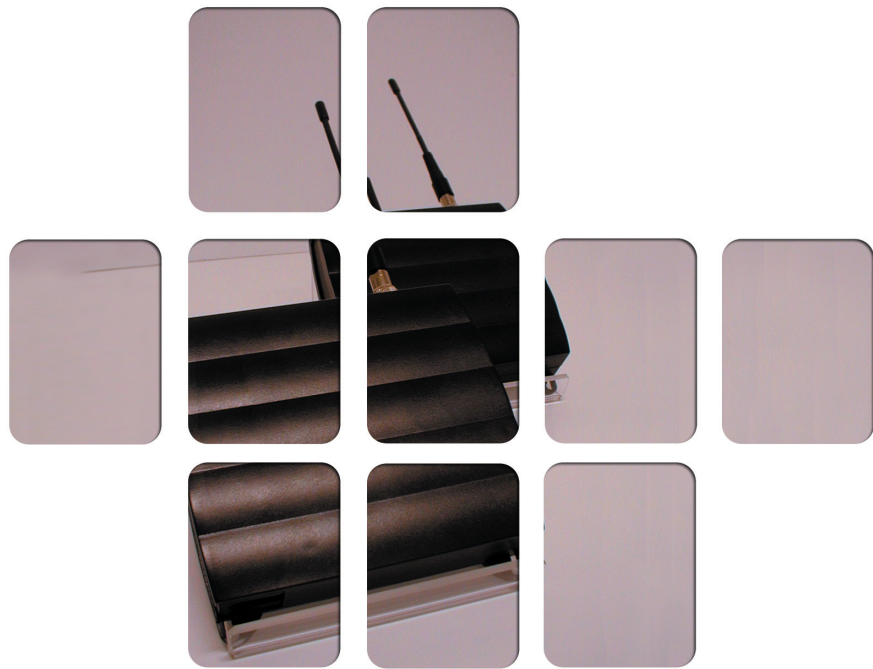

I·R·I·S

Industry Resource Internet Supervision

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IRIS Configuration - Manual

IRIS-Config-Manual-1a

The IRIS-system

An IRIS-system consists of a group of IRIS-units arranged in a tree structure (see picture below) connected to each other by radio.

The top unit is the concentrator in the system and the connection to end-user via, for example, a serial interface, a web-module or a GSM-module. The other units in the system are connected to various electronic equipments or acts as repeaters to enable communication over longer distances.

There are different types of IRIS-units with different functions. Digital and analogue inputs, digital outputs, serial interface, timers and counters are examples of some of the functions available.

It is possible to configure the IRIS-units either before setting up the system on location or after using the radio link or the serial interface.
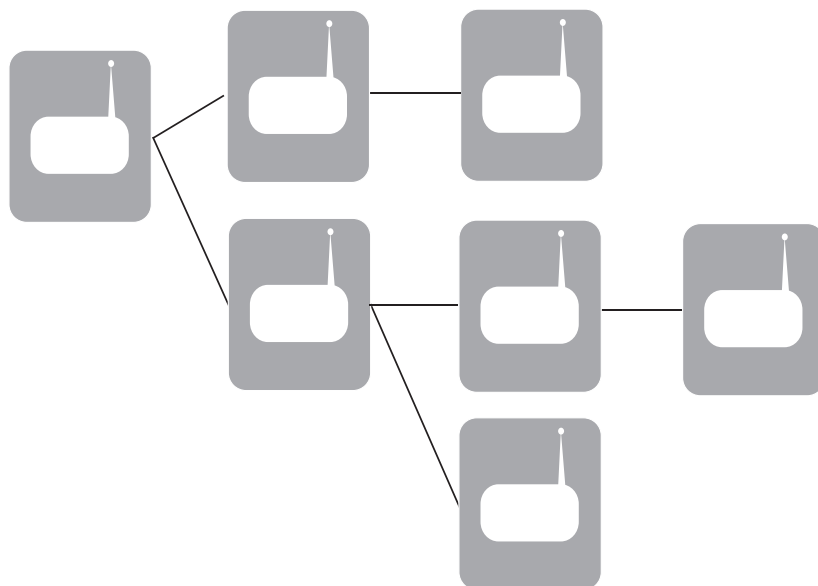
IRIS configuration program

The configuration program helps the user to setup an IRIS-system.

Project

An IRIS-system is two or more IRIS-units communicating with each other, with other electronic equipment and with the end-user.

To make it easier to administrate and create an IRIS-system, all the units' configuration files are stored in the same project folder.

Create a project

Start with creating a configuration file for each unit that are in the system. Make sure that the identification number and the type of unit is correct. When a file represents each of the units it is time to setup and program the units.

Unit

An IRIS-unit can be used for control, surveillance and relaying information from various electronic equipments.

Create a unit

Choose "New IRIS unit" under" the File menu.

New IRIS unit:

- ID number

  - All units come with a unique identification number.
  - Enter the number of the unit

- Alias

  - To make it easier to administrate it is possible at name the unit.
  - Enter an alias for the unit. If the unit is not named the alias is equal to the identification number.

- Type of unit

  - There are different kinds of units.
  - Choose the type from the list.

Delete a unit

Choose "Delete IRIS unit" under the File menu.

Delete IRIS unit:

- Choose unit from list and press the "Remove unit" button.

Export

It is possible to save all or some of the settings for reuse in other unit files.

Choose "Export IRIS unit" under" the File menu.

Export:

- Check the parameters that are to be saved

- Name the file

Import

It is possible to retrieve settings saved by the export command.

Choose "Import IRIS unit" under" the File menu.

Import:

- Choose file to import

Setup

For the unit to interact properly with its environment it is vital that the setup is done carefully.

Network setup

Describes how the IRIS-unit interacts with other IRIS units, closes to it in the system.

Alias:

Alias is the name of the unit. It makes it easier to identify units in large systems.

Upper unit:

The unit closes to the IRIS-unit, up the tree structure.

New upper unit:

• Choose unit from the list on the right and press the "Select upper unit" button.

Remove upper unit:

• Press the "Delete upper unit" button.

Lower units:

The units closes to the IRIS-unit, down the tree structure.

Add lower unit:

• Choose unit from the list to the right and press the "Add lower unit" button.

• Continue until all lower units are added to the list on the left.

Remove lower unit:

• Choose unit from the list on the left and press the "Remove lower unit" button.

Ping times:

Ping time is used to detect a lost connection it the network. If there is no radio communication, for a certain time, the unit send a short message to establish contact. The upper unit is, in most cases, responsible to maintain the radio connection.

Change ping time

- Choose ping time from the list
- To change ping time for the upper unit
    - Press "Change upper unit ping time" button.
- To change ping time for a lower unit
    - Choose unit from the list to the right
    - Press "Change lower unit ping time" button.

Allowed setup:

To prevent unauthorized changes in the IRIS-units settings, it is possible to setup restrictions on how to change setting.

Change allowed setup:

- All IRIS units:
    - It is possible to change settings using any IRIS-unit
- All IRIS setup units:
    - It is possible to change settings using an IRIS setup unit.
- IRIS unit:
- It is possible to change settings using an IRIS-unit with a specific identification number.
- Via serial interface:
    - It is possible to change settings via the serial interface without using an IRIS-unit.

Radio setup

Channel

To avoid interference with other systems it is possible to use different radio channels.

All IRIS units in the same system most use the same channel setting.

- Channel 1-69 is in the 433MHz frequency area
- Channel 70-81 is in the 439 MHz frequency area

Protocol

For now there is only one radio protocol, the IRIS-standard protocol.

If there is a need in the future versions of the program it is possible to add other protocol as well.

Number of retransmissions

The time between two retransmissions varies to avoid repeated collisions of messages.

- Enter minimum and maximum time in the fields
- If minimum time equals maximum time the retransmission time is fixed.

Broadcast

It is possible to make restrictions in how the IRIS-unit handles broadcast messages.

- To all units
    - Send the broadcast message to both the upper unit and the lower units
- Only to lower units
    - Send the broadcast message to the lower units
- No broadcast function
    - Do not send broadcast messages

Gateway

It is possible to disable the message relay function in the IRIS-unit.

- On
    - The IRIS-unit relays messages to other units
- Off
    - The IRIS-unit does not relays messages to other units

Serial communication setup

Any changes in the serial communication setup can have effect on the possibility of future changes of the setting.

Baudrate

- The baudrate is between 300 and 115200 baud.
- Default:
  - 9600 baud

Parity

- Uses odd, even or no parity.
- Default:
  - No parity

Stop bit

- The IRIS-unit handles 1 or 2 stop bits
- Default:
  - 1 stop bit

Protocol

The current version of firmware in the IRIS-unit supports:

- RS-232
- RS-485 full duplex
- RS-485 half duplex

In future versions:

- IRIS to IRIS protocol
  - Makes it possible to connect two IRIS-units via the serial interface instead of radio.

Timeout / Detect end of text

A timeout after the last character is one way of determine when a text is fully received.

- Possible timeouts:
  - 50ms, 100ms, 200ms, 500ms, 1s and 2s

"Detect end of text" uses a sequence of one or two characters to determine when a text is fully received. To enable the use of non-printable characters the IRIS-unit uses the ASCII-codes for the characters, the decimal value. It is possible to use one of the predefined sequences or enter a user-defined sequence.

- Predefined sequences:
  - 13,10 (CRLF), 13 (CR), 10 (LF) and 3 (ETX)

It is possible to use both "Timeout" and "Detect en of text" at the same time.

Timer setup

The IRIS-unit has four timers that can be used for generating events.

- Resolution:
    - 100ms

- Maximum time:
    - 4000h

Counter setup

The IRIS-unit has four counters for that can be used generating events.

- Maximum value:
    - 4 294 967 295

Input setup

An IRIS-unit can have up to six inputs. The inputs can be set to either digital or analogue.

Voltage range

Different models of the IRIS-unit have different voltage range on there inputs.

Digital

The input is either high or low. The result is stored in InputA.

Lower limit

Defines the upper limit for a low level.

Upper limit

Defines the lower limit for a high level.

Analogue

The input has an analogue value that equals the input voltage multiplied with the scale factor and added to the offset.

$$Analogue\ value = Measured\ value * Scale + Offset$$

It has also two digital values. One for the lower limit stored in InputA and one for the upper limit stored in InputB.

Lower limit

Defines the lower of two limits. It is scaled and uses the hysteresis.

Upper limit

Defines the upper of two limits. It is scaled and uses the hysteresis.

Hysteresis

The hysteresis is scaled and symmetric around the limit – Limit ± Hysteresis/2.

Scale

The scale factor is a value used to modify the measured value.

- Min
  - 0.001
- Max
  - 1000

Offset

The offset is an integer value used to modify the scaled value and cannot be more than thirty times the scale factor.

Events

An event occurs when for example, an input that changes value or a timer that reaches its limit. It is possible to add actions to the events to make the IRIS-unit interact with its environment.

Add events

Events can be turned on and off using the checkbox to the left of the event.

Add actions to events

An event can have one or more actions. To add an action to an event just press the action button to the right of the event and choose one or more actions from the list. If there is an action missing, go to the appropriate action tab to create a new action.

I/O events

I/O events are generated with bit masks that are compared to the current state of inputs, outputs and flags.

Double click on the bits to change the values.

Bit value

- 0 – Low

- 1 – High

- - – Ignore

InputA

Represents digital inputs and the lower limit for analogue inputs.

InputB

Represents the upper limit for analogue inputs.

Output

Represents digital outputs.

Flags

Are used for representation of other events.

Timer events

There are four timers with one event each. An event is generated after a preset time has evolved.

Counter events

There are four counters with two events each. An event is generated after the counter has reached the preset value or if the counter has gone below zero.

Network events

The IRIS-unit is monitoring its the upper unit and its lower units.

Unit online

The event is generated when one of the nearby units goes online after been offline for a while.

Unit offline

The event is generated when one of the nearby units goes offline.

Radio events

Transmitting and receiving packages on the radio generates radio events.

Package received

A package is received successfully.

Receiving error

There was an error when trying to receive a package.

Acknowledge received

An acknowledgement was received on a transmitted package.

Not-acknowledge received

A receiving unit has reported an error in a transmitted package.

No receipt

There was no receipt on a transmitted package.

Serial communication events

Receiving packages via the serial interface generates serial communication events.

Package received

A package is received successfully.

Receiving error

There was an error when trying to receive a package.

Unit events

Unit booting

The first event generated after the unit is started.

Message events

The IRIS-unit can store twenty different strings of text. Each text can be up to thirty characters long and can include wildcards. An event can be generated by a message that comes via the radio and/or via the serial interface.

Wildcards

- ? – Replaces one character
    - There is no limit on how many that can be used in a text

- * – Replaces one or more characters
    - One at the beginning of the text, one inside the text and one at the end of the text are allowed.

Type of message

Different types of received messages can generate different kinds of actions.

Transparent message

- Message that just is relayed to other units in the system.

I/O command

- Message that changes the output and/or the flags.

Configuration command

- Message that changes the configuration of the IRIS-unit.

Broadcast message

- Broadcast message

Actions

The IRIS-unit interacts with its environment through different kinds of actions. It could be for example a changed output, an increased counter or a sent message.

All created actions are saved in a list.

Message actions

The IRIS-unit can send predefined messages to all units in the system. The messages are of different types and may include various parameters.

Type of message

- Message
  - Normally used for most messages.
- Alarm
  - Alerts the end-user that something may be wrong.

Text string

A message is a mix of static text and parameters.

There can be up to twenty predefined messages.

Add parameters

The parameters store information about the IRIS-unit and of the current status of the IRIS-unit.

Id
- <I>
- The IRIS-units identification number

Alias
- <A>
- The name of the IRIS-units

Type
- <T>
- Type of IRIS-unit

Version
- HW
  - <H>
  - Hardware version
- SW
  - <S>
  - Software version

Input
- <I1> - <I6>
- The current value of the specified digital or analogue input.
  - A digital input is represented by 0 or 1
  - An analogue input is represented by a decimal value with three digits resolution.

Output
- <O1> - <O4>
- The current value of the specified digital output represented by 0 or 1.

Flag
- <F1> - <F8>
- The current value of the specified flag represented by 0 or 1.

All I/O
- <IO>
- The current digital values of all inputs, outputs and flags.
    - InputA 1-6 InputB 1-6 Output 1-4 Flag 1-8

Timer
- <T1> - <T4>
- The current value of the specified timer

Counter
- <C1> - <C4>
- The current value of the specified counter

Message
- <M>
- The received message
- Can only be used in message actions trigged by a message event!

Create message action

Choose a message number and a destination from the lists and press the "Create action" button.

Output and flag actions

Changes the values on its own outputs and flags or sends a command to another unit in the system to change its outputs and flags.

Create an output and flag action

Set the values on outputs and flags and choose a destination.

Double click on the bits to change the values.

Values:

- 0 – Low

- 1 – High

- T – Toggle value

- - – Do not change value

Destinations:

- - – Local command

- Identification number – Another unit

Timer actions

Timer actions control the timers.

- Set time
    - Changes the preset end-time.

- Restart timer
    - Resets and starts the timer.

- Start timer
    - Starts the timer on the value it stopped.

- Stop timer
    - Stops the timer. Does not reset it.

Counter actions

Counter actions control the counters.

- Set limit
    - Changes the upper limit on the counter.

- Restart counter
    - Resets the counter

- Increase counter
    - Increases the counter with the selected value.

- Decrease counter
    - Decreases the counter with the selected value.

Configuration of the IRIS-unit

It is possible to setup all the parameters at the same time, or just some of them.

Connect to the IRIS-unit

There are different ways to connect the PC to the IRIS-unit.

Direct connection via serial interface

Connect the PC and the IRIS-unit with a serial cable. Make sure that the serial interface settings are the same on both the PC and the IRIS-unit.

Choose "Communication setting" under" the Settings menu to make changes the PC settings.

Default values for the IRIS-unit are:

- Baudrate
  - 9600 Baud
- Data bits
  - 8
- Stop bits
  - 1
- Parity
  - None

Remote connection via radio

Connect the PC and the other IRIS-unit with a serial cable. Make sure that the serial interface settings are the same on both the PC and the IRIS-unit.

Via a standard IRIS-unit

A standard IRIS-unit need to know the identification number of either the IRIS-unit to be setup or another IRIS-unit within the same network.

If the standard IRIS-unit already is a part of the network, no more preparations are necessary.

If it is not some small adjustments have to be made in the IRIS-unit connected to the PC:

· If the two units are within radio range:

o Set the IRIS-unit that is to be configured as either Upper or Lower unit in IRIS-unit that are connected to the PC.

· If the two units are not within radio range:

o Choose a unit, with in range and that are connected to the network, and set it as Upper unit in IRIS-unit that are connected to the PC.

Via an IRIS setup unit

The IRIS setup unit needs to be within radio range of either the IRIS-unit that is to be configured or the network that the IRIS-unit is a part of.

Send setup to the IRIS-unit

· Press the "Send to IRIS" button on the IRIS unit tab.

· Check the parameters that are to be sent and press the "Ok" button

· Wait until the transmission is ready.