



T24 - Wireless Telemetry

Telemetry Training - Part 1

January 2015

T24 - Training Sections

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Chapter 1

Wireless Considerations



Why Go Wireless?

PROs

- Wireless units are easily re-usable i.e. temporary installation
- No long and costly wiring lay outs
- Non contacting for precision or rotating measurements i.e. temp, pressure, RPM, torque
- Wireless link can cost less than buying and *installing* a cable
- Easy to Seal
- Eliminates failure due to cable damage
- Long battery life

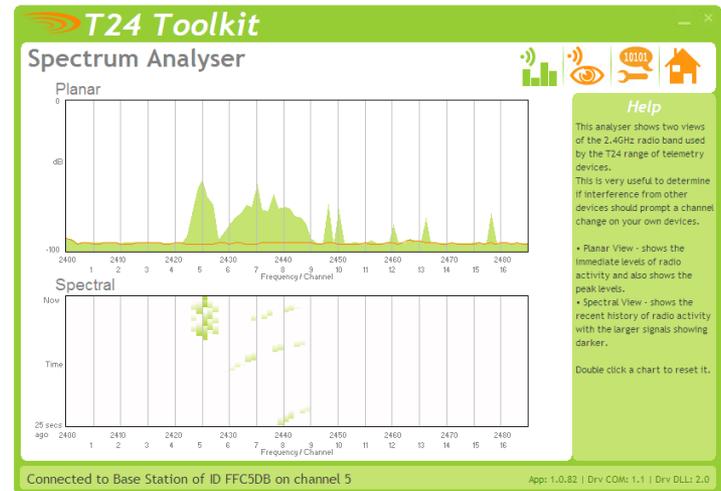
CONs

- Radio communication is highly regulated
- New and maybe unfamiliar aspects of RF such as antenna positioning and RF interference sources
- Planning, buying and testing a wireless link may cost more initially
- Access is usually still required for changing or recharging of batteries



T24 - Wireless Considerations

- Range
 - How far must data travel ?
 - Nominal range “open field range” **ACTUAL** range depends on environment
- Data
 - What type of data and how fast ?
- RF Interference
 - 2.4 GHz is a busy part of the RF spectrum
 - Radio signals can be intercepted & jammed
 - Installations in proximity must be co-ordinated

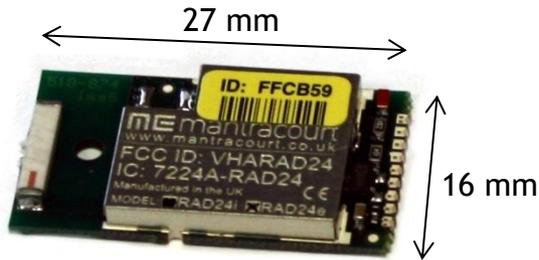


Chapter 2

Mantracourt RAD24 Module



The 2.4 GHz Radio Module



RAD24i Integral Antenna



RAD24e External Antenna



- Radio modules have a unique 6 digit HEX ID
- Proprietary protocol avoids Interference
- Complies with IEEE 802.15.4
- Worldwide licence exempt 2.4 GHz radio
- FCC & ETSI Approved



The 2.4 GHz Radio Module

Overview

- Supply voltage 2.1 - 3.6V
- Low current consumption
 - Running < 33mA
 - Sleep < 2 μ A
- Range up to 200 m line of sight
- Extendable range through use of repeaters



ANT A

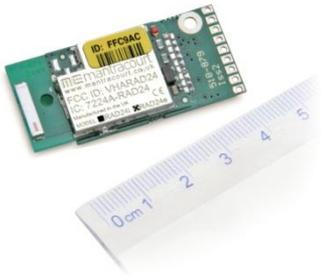


ANT B



The T24 Product Range

Data Providers



Acquisition Modules

- T24-SA - Strain Transmitter
- T24-VA - Voltage Transmitter
- T24-IA - Current Transmitter
- T24-SAf - High Freq. Strain Transmitter



Data Consumers



Handhelds

- T24-HS - Handheld Simple
- T24-HA - Handheld Advanced

Output Modules

- T24-SO - Serial Output
- T24-PR1 - Printer
- T24-AO - Analogue Output



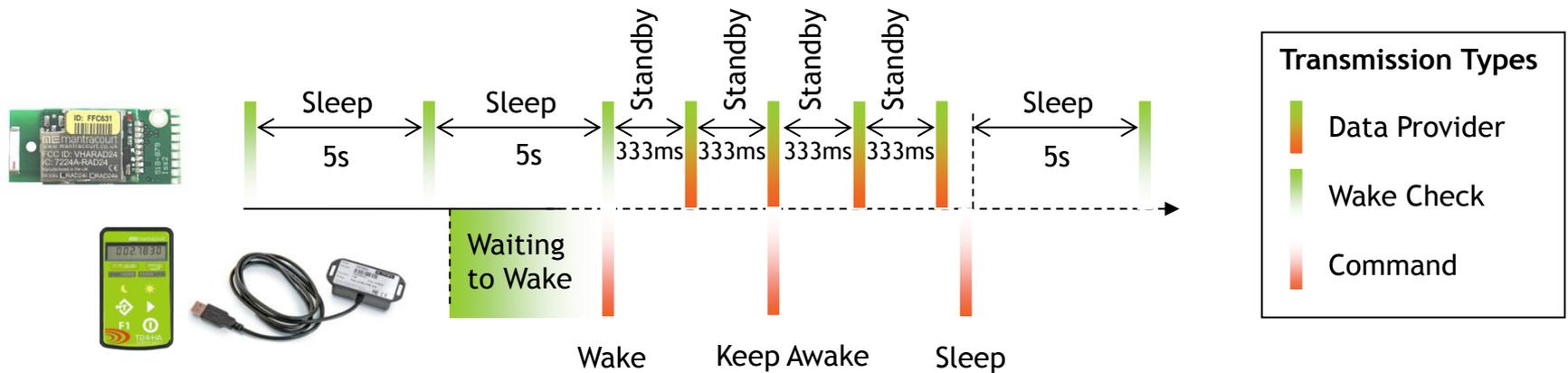
Base Stations

- T24-BSu - USB Base Station
- T24-BSi - Industrial Base Station



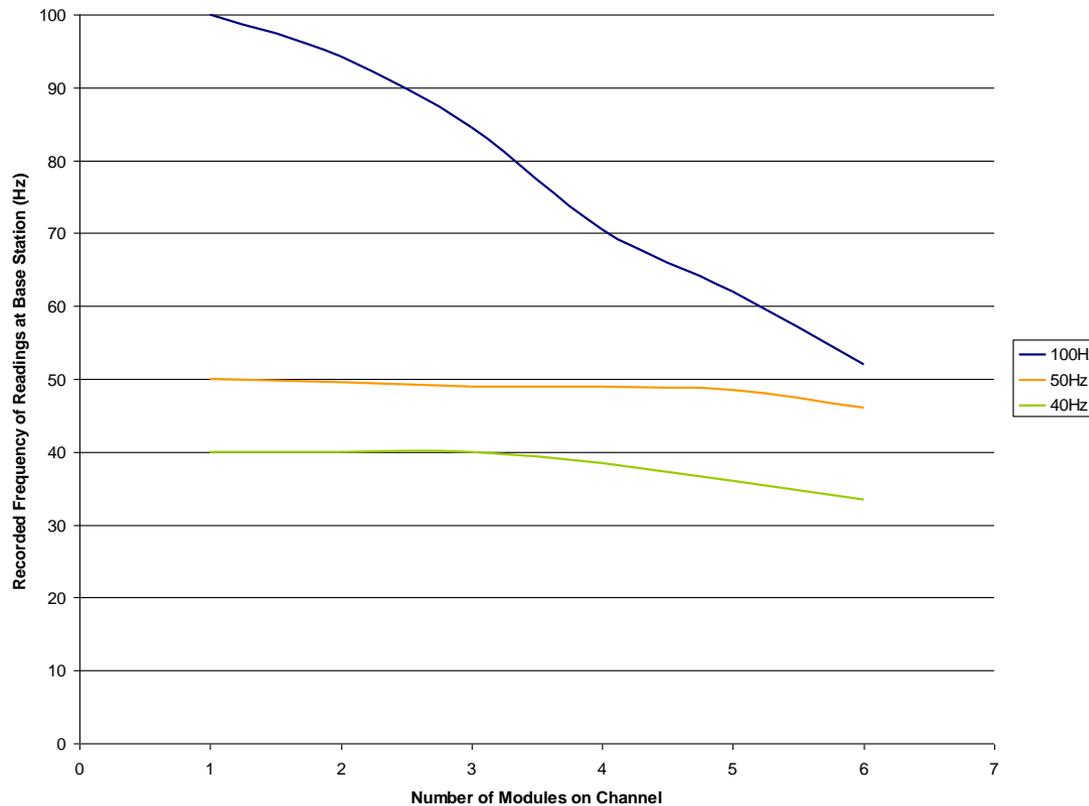
System Architecture

- Data is not requested but provided by transmitter modules
- Transmitter modules Sleep & Wake to preserve battery life
- Sleep & Wake functions controlled by data consumers e.g. base station or handheld
- Sleeping modules intermittently check to wake (default 5 sec)
- Data consumers Wake Modules by responding to Wake check transmissions (default 12 sec)



System Architecture

- Multiple devices occupy the same RF channel
- Data is identified by the RAD24 appending a data tag
- Number of devices on a channel depends on transmission rates



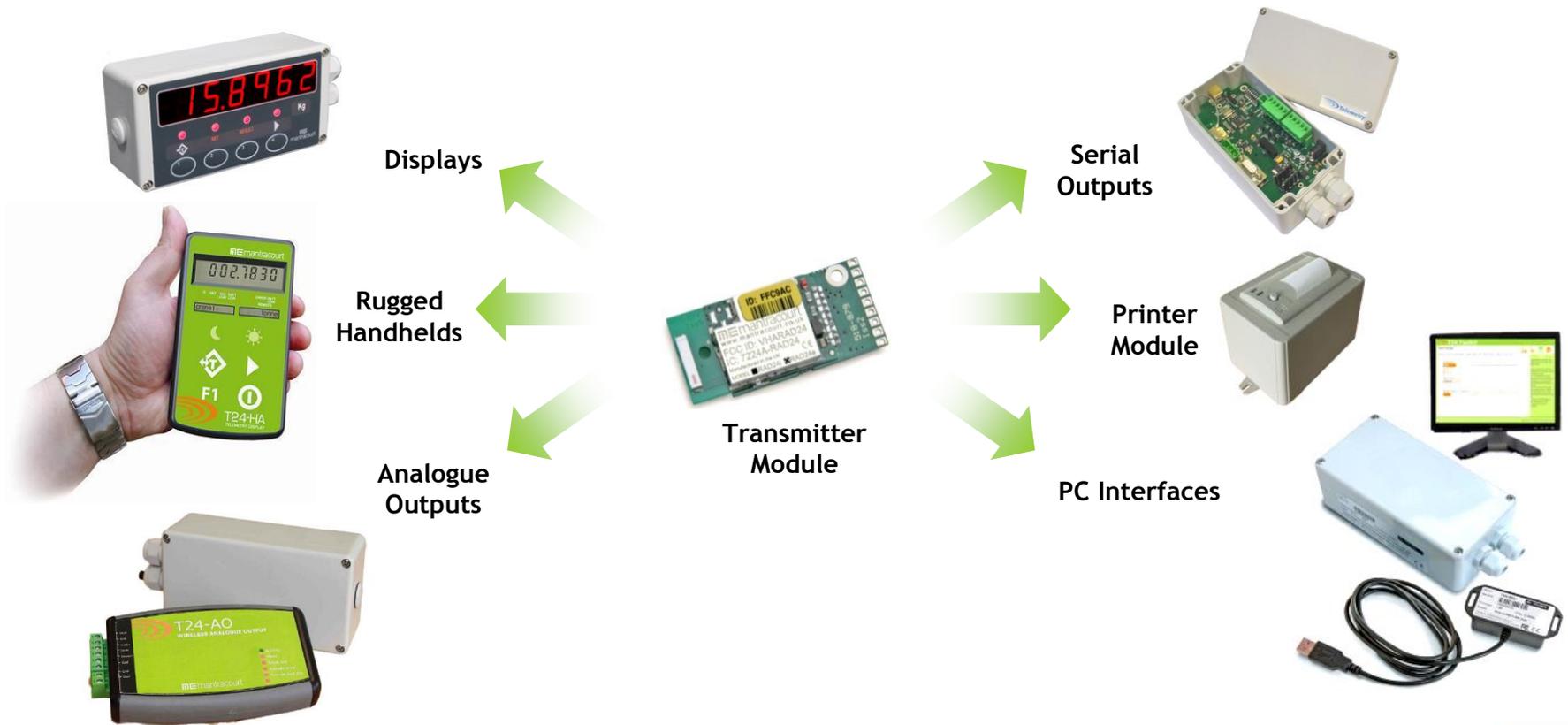
Chapter 3

Modular Designs



Modular Design Focused on Your Application

The T24 range has been designed so that one acquisition module can provide data to multiple output devices and accept data from multiple transmitter modules.



Simple Links for Simple Solutions

Acquiring inputs from multiple or single sources to static and portable displays allows operators to monitor their sensor data in real time.



Transmitter Modules



Display Module

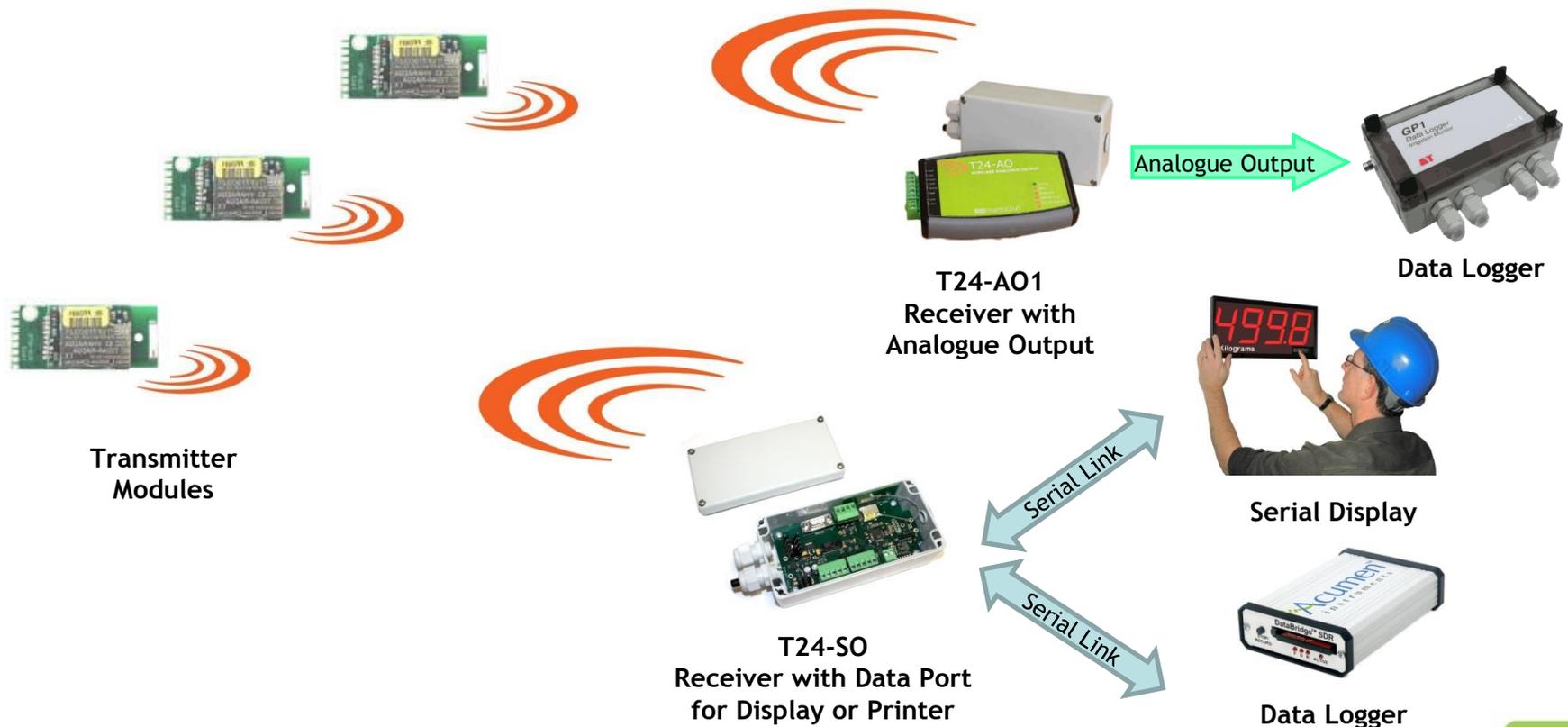


T24-HS
Handheld



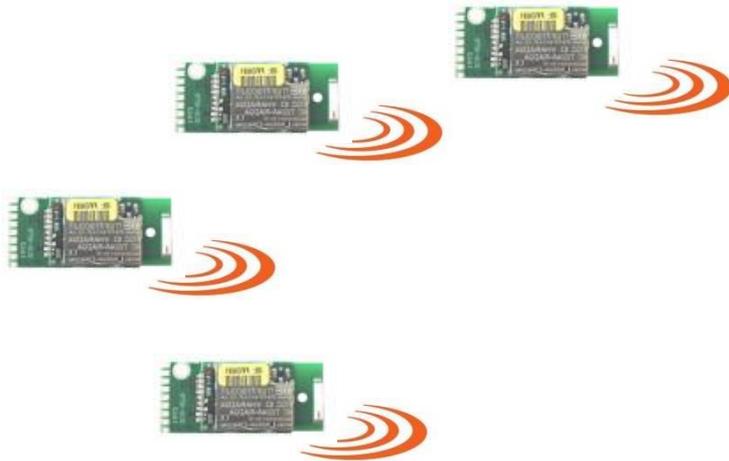
Display and Log Your Data in the Field

Acquiring data from multiple inputs can simply be displayed or logged to any RS232 display or data logger. Alternatively a single transmitter module output can be represented as an Analogue output.



On-site Logging & Monitoring

On-site PC terminals are commonly available and can easily be used to gather and log data from multiple transmitter modules on-site. Coupled with custom software for your application, graphical representations can be created for your sensor data.



**Transmitter
Modules**



**T24-Bsu, T24-BSue or T24-BSi
Telemetry Base Stations**



Worldwide Data Acquisition to Desktop

Time stamped on reception all data collected is forwarded to your desktop via email or direct to your company server, as well as providing instant SMS alerts to your mobile phone triggered by user defined sensor inputs.



Chapter 4

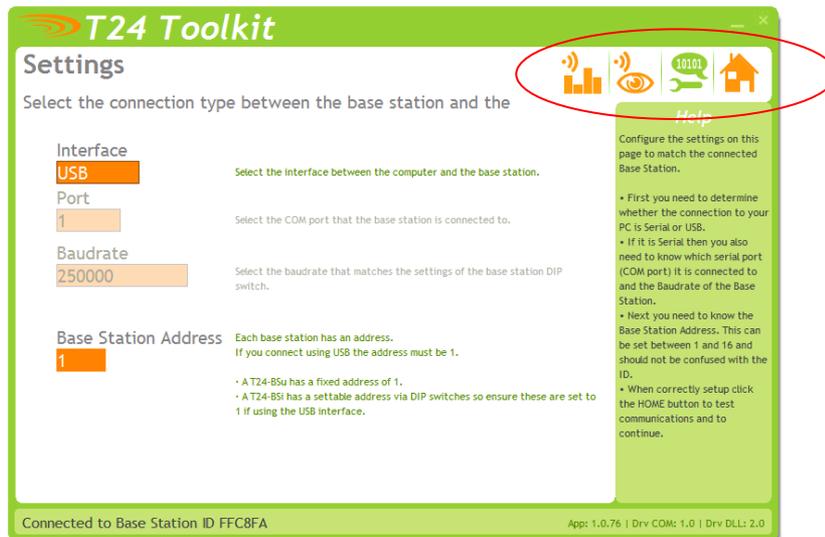
T24 Software



T24 Toolkit Software

- Simple Setup.exe to install T24-TK provided on CD
- On Start up select interface
- Select “Home” tab

Navigate the Toolkit by clicking on tabs



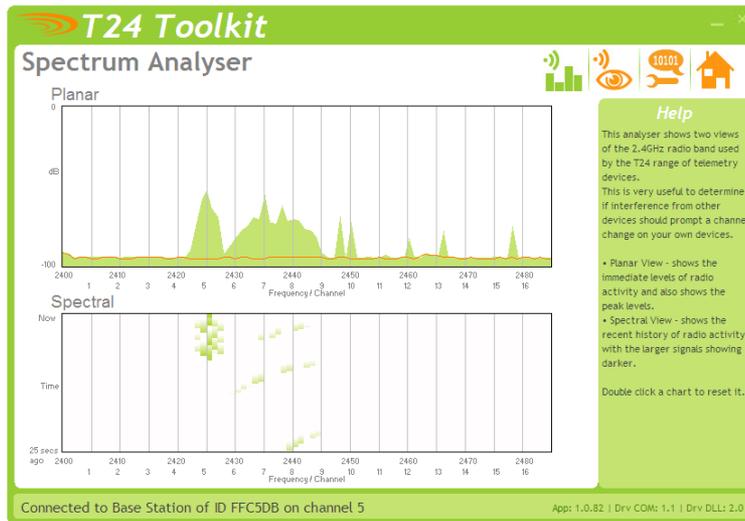
- Successful configuration



T24 Toolkit RF Tools



Spectrum Analyser



Data Provider Monitor



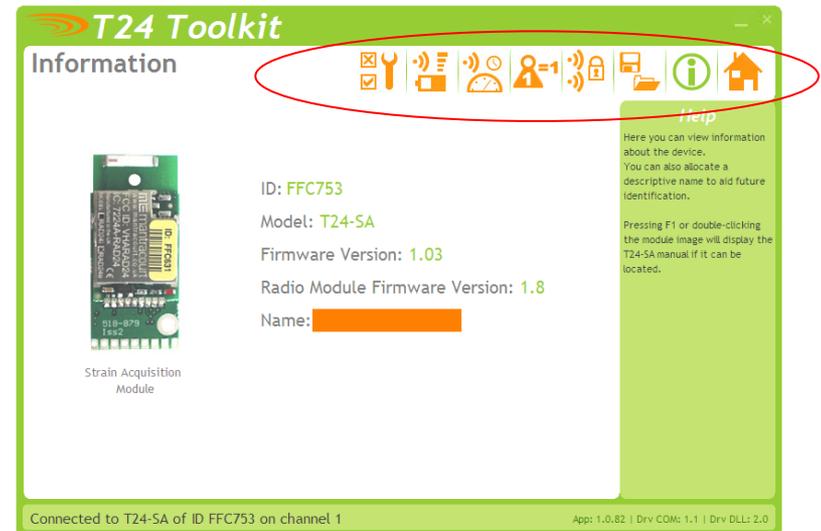
1. Start / Stop Logging : Log all available data providers to *.csv
2. Clear list : Clears all data in list



T24 Toolkit Software

- Successful pair function shows information screen

Navigate the Toolkit by clicking on tabs

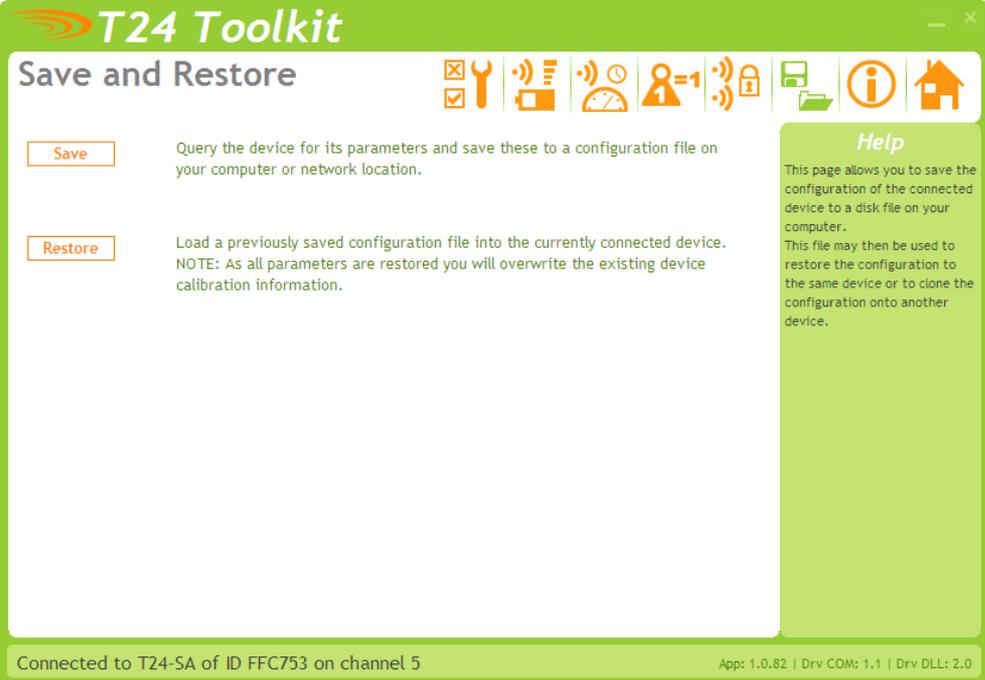


- Pair function
 - Click pair
 - Hard power cycle any device



T24 Toolkit Common Pages

Save & Restore



1 **Save** Query the device for its parameters and save these to a configuration file on your computer or network location.

2 **Restore** Load a previously saved configuration file into the currently connected device. NOTE: As all parameters are restored you will overwrite the existing device calibration information.

Help
This page allows you to save the configuration of the connected device to a disk file on your computer.
This file may then be used to restore the configuration to the same device or to clone the configuration onto another device.

Connected to T24-SA of ID FFC753 on channel 5 App: 1.0.82 | Drv COM: 1.1 | Drv DLL: 2.0

1. **Save** : This function will save all configuration data, including calibration, to a *.tcf File
2. **Restore** : This function allows the configuration from a *.tcf File to be reloaded into a transmitter Module



T24 Toolkit Common Pages

Channel & Encryption

1 Channel: 05 (You can select 1 of 16 channels)

2 Encryption Key: 00000000000000000000000000000000 (The encryption key is 32 hex characters long. Characters allowed are 1234567890ABCDEF)

Help
 Here you can change the channel and encryption key for the connected device.
 NOTE: The device will need power cycling before these changes take effect. If you power cycle the device you will need to click the HOME button and pair the device again with this application.

Advanced

Connected to T24-SA of ID FFC753 on channel 5
 App: 1.0.82 | Drv COM: 1.1 | Drv DLL: 2.0

1. Channel (1-16) : RF channel data is to be transmitted on
2. Encryption Key : 32 HEX Key, this is not enabled at present on Radios but will be once system release has stabilised
3. Secure due to proprietary transmission protocol



Chapter 5

T24 Base Stations



Base Stations

- T24-BSu
 - USB base station
 - Small size
 - Powered from USB bus
 - 100 m range

- T24-BSue
 - USB base station
 - Powered from USB bus
 - 200 m range

- T24-BSi
 - Industrial base station
 - 200 m range
 - Interfaces : USB, RS232, RS485 up to 460800 baud
 - External supply 9 - 36 V (not under USB)



- Connect to your base station by SHIFT + pair



Base Stations



2



1. Apply system name (Optional)
2. Waker duration : Period waking will be attempted for.





Thank you for your attention

Part 2 of this presentation can be
downloaded from our website

For further information visit:
mantracourt.com