HOW LODAR WORKS (simplified)

The Transmitter

During manufacture each Transmitter is given ONE of over 16 MILLION registration codes.

Each key, STOP, SET and Functions F1 through F16 also has its own I.D.

When a key is pressed it causes the Transmitter registration and its key code and a checksum to be transmitted.

The Receiver

During manufacture each Receiver has its Transmitter code REGISTERED into memory.

Each output is allocated to a Transmitter Function key.

Side by side Transmitter keys are interlocked at the Receiver, for example if output F1 is operational output F2 will not work.
Side by side keys are generally used in pairs so Lodar engineers chose this STANDARD setup for safety.

When the registered Transmitter SET key is pressed, the Receiver compares its registration code with the code in its own memory.
If there is a match the Receiver is activated.

When a registered Transmitter Function key or keys (F1 through F16) is/are pressed, the Receiver first verifies its registered code and then identifies the Function key or keys. If all is correct the appropriate output or outputs is/are activated. When the key or keys are released the output or outputs are deactivated. The output is momentary, active only when there is a transmitted signal.

THE ABOVE IS THE STANDARD SETUP FOR LODAR SYSTEMS LEAVING THE FACTORY.

THE RECEIVER CAN BE CONFIGURED FOR THE FOLLOWING:-

INTERLOCKS
> Limit the Functions that can be used when a given Receiver Function is active.

PUSH/PUSH LATCH
> First push of a Transmitter key activates a Receiver Function, which remains active until the same Transmitter key is pushed for second time.

PARALLEL MASTER INHIBIT
> Inhibit the Parallel Master Output for a given Function.

CHANNEL TIMEOUT DELAY
> A Function (channel) will drop out if a signal is not detected (standard 80milliseconds)
> Increasing this delay slows the response of the Receiver to the Transmitter, but improves range and performance.

MASTER ON DELAY
> The delay between Function activation and Parallel Master activation (standard is NO delay)

RADIO BUTTON DE-LATCHING   A latched Function is first de-latched when a second Function is to be latched.
Not all models

OUTPUT ALLOCATION   The ability to allocate a Receiver Function or Functions to a given Transmitter Function.

TRANSMITTER TIMEOUT   The time taken for a Transmitter to timeout, adjustable from 255 minutes down to 1 minute or no timeout.
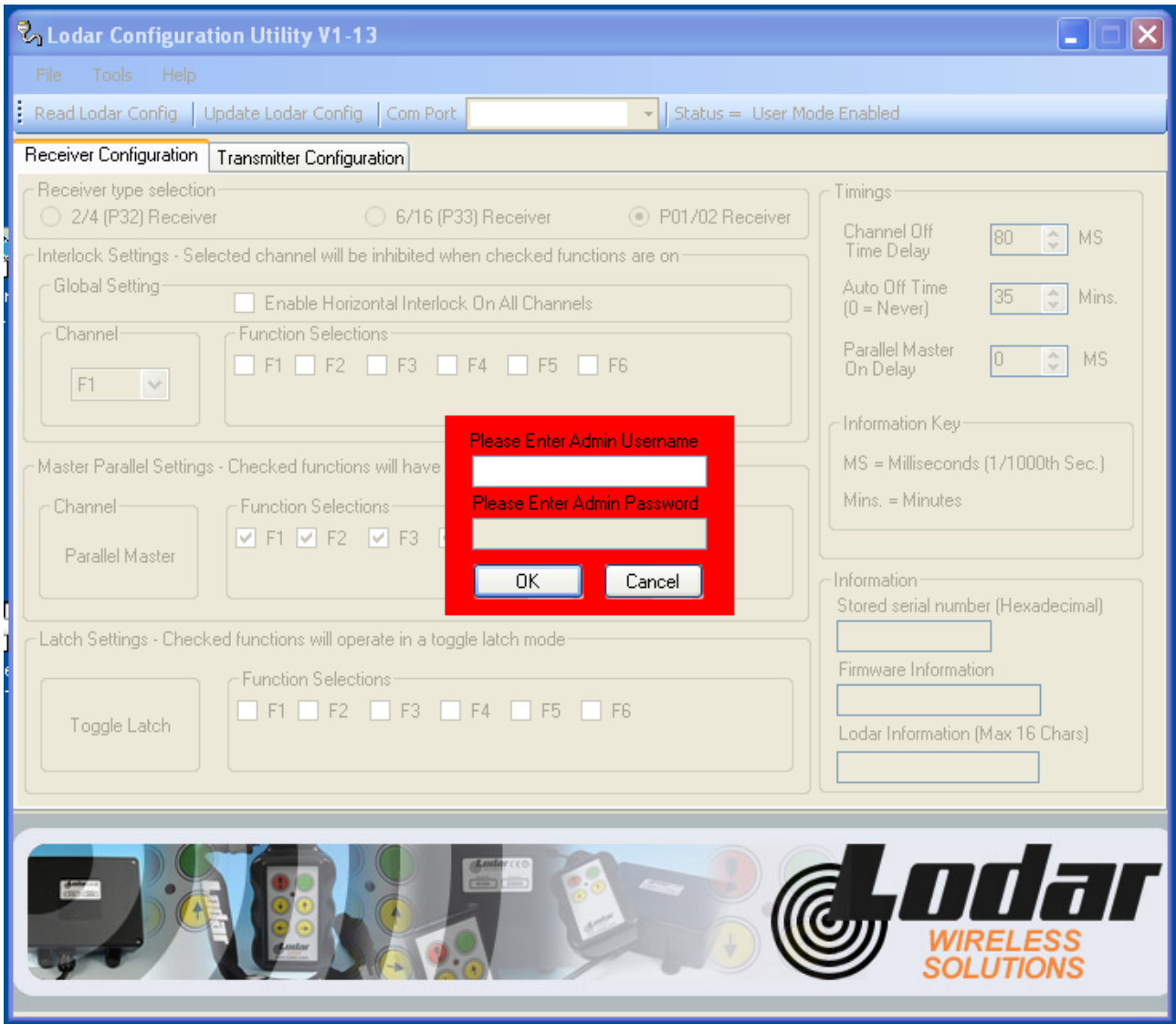
RECEIVER TIMEOUT   The time taken for a Receiver to timeout, adjustable from 255 minutes down to 1 minute or no timeout.

SOFTWARE

Lodar Configuration Utility

To enter Admin Mode
Go To   Tools/Options/Admin and press Return.
This will display the Log In box. As shown below.

Enter your User Name, remember this is case sensitive, then enter your password and click OK.

You now have access to all areas of the utility and the screen appearance will change, see next screen shot.

Configuration Utility for 2 and 4 Function Receivers
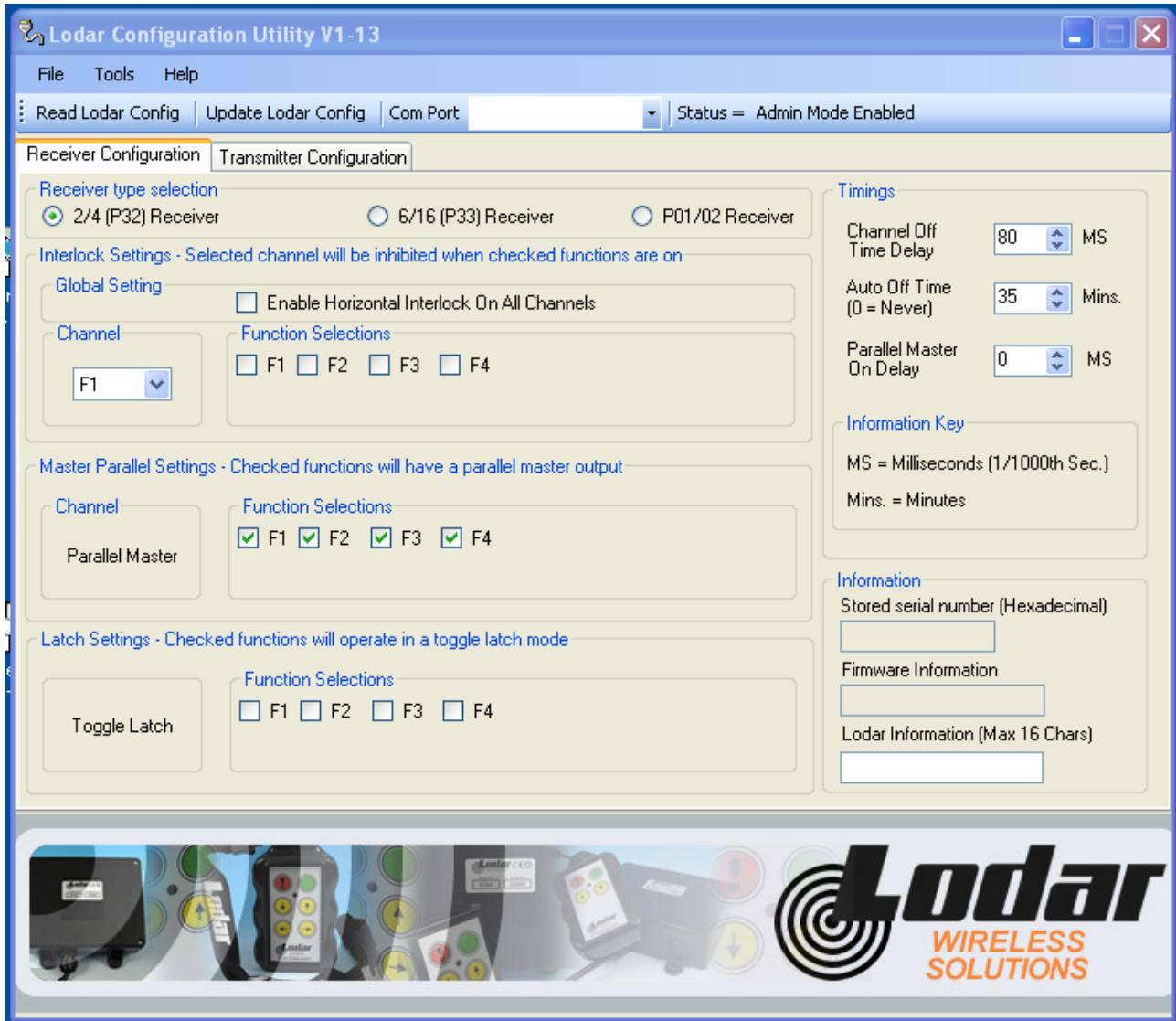
Receiver configuration

Receiver Timeout

The receiver "time out" can be altered anywhere between the following limits: -

0	equals NO TIMEOUT
30	this is the standard setting when receiver leaves the factory
255	equals 255 minutes, the maximum timeout other than no timeout

Channel timeout delay

This is the maximum time in milliseconds a receiver can look for a signal from the transmitter before it must switch off. This is adjustable between 80mS and 2500mS in 10mS increments. The factory setting is 80mS.

When the received radio signal breaks up because Lodar is at its range limit, or the local environment is such that the signal is poor, then the output from the receiver will become intermittent. Increasing the channel timeout delay generally will stop this from happening, the down side is that when transmission ceases, there will be a delay before the receiver switches off its output.
WE RECOMMEND THAT CHANNEL TIMEOUT DELAY IS NO GREATER THAN 300mS.
A 300mS delay time will substantially increase working range of Lodar.

Master Output
This can be either: -
PARALLEL, is activated by any Transmitter FUNCTION but not STOP or RESET.
CONTINUOUS, is activated by Transmitter RESET de-activated by Transmitter STOP.

When the jumper is on LK1 the master output will be continuous.
When the jumper is across LK2 the master output will be parallel.
Note: - the jumper can only be on one link at a time.
THIS IS CHANGED BY JUMPER ONLY, NOT BY SOFTWARE.

Master on delay
This only applies when the master output is configured to switch in **parallel** to a function output.

The delay is the time between a function output being switched by a transmitted signal, and the subsequent switching of parallel master, it is adjustable between 0mS and 2500mS in 10mS increments, and factory setting is NO DELAY.

This feature can be very useful with electro-hydraulic systems, when switching a solenoid for a pump motor with the master output while the function output is switching a solenoid valve.

Switching the valve just before the pump, guarantees that the line is not pressurised before the valve has opened.

Switching the valve and the pump at the same time can produce a very large current surge and consequent Volts drop, this can cause the *Safety Circuits* in Lodar to switch the system off in order to protect the processor. Switching the valve before the pump will stop this from happening.

Inhibit parallel receiver output
If a parallel output is not required for a given function, this can be inhibited.
Factory setting is all outputs have a parallel output.

Typical uses are with electro hydraulic systems, when the pump is not required for a particular function usually gravity down. Other uses could be on a latched output for a light say, when a parallel output is not required.

Momentary receiver output
A momentary receiver output is active only when it's given transmitter output is active, this is the factory setting.

Toggle latch receiver output
A toggle latch receiver output is activated by a it's given transmitter output, and remains active until a second transmitter output or STOP signal is received. The factory setting is a momentary output.

Output Interlocks
An interlock is the ability of a given output, when it is active to "lock" another output, so that the "locked" output will only work when the given output is inactive.

Interlocks "Global Setting" check box
When checked enables horizontal interlocks on all output channels (functions), this relates to the layout of the transmitter keypad, so if output F1 is active then output F2 is locked, and visa versa. Likewise F3 and F4 are interlocked, F5 and F6 etc.
THIS IS THE STANDARD SETTING
Note. It is possible to interlock all outputs, for example if F1 is active F2 through to F16 can be "locked" out.

Configuration Utility for 6, 10 and 16 Function Receivers

Receiver Configuration Information

Stored serial number (Hexadecimal)
This is the transmitter serial number, if registered for that receiver.

Firmware version
This is manufacturing information about the processor

Lodar Information (Max 16 Chars)
This box is for entering specific customer spec info etc, to a maximum of 16 characters. This is for the use of agents who have the Configuration Software,

Configuration Utility for 2,4 and 6 Function Receivers with Surface Mount FET's
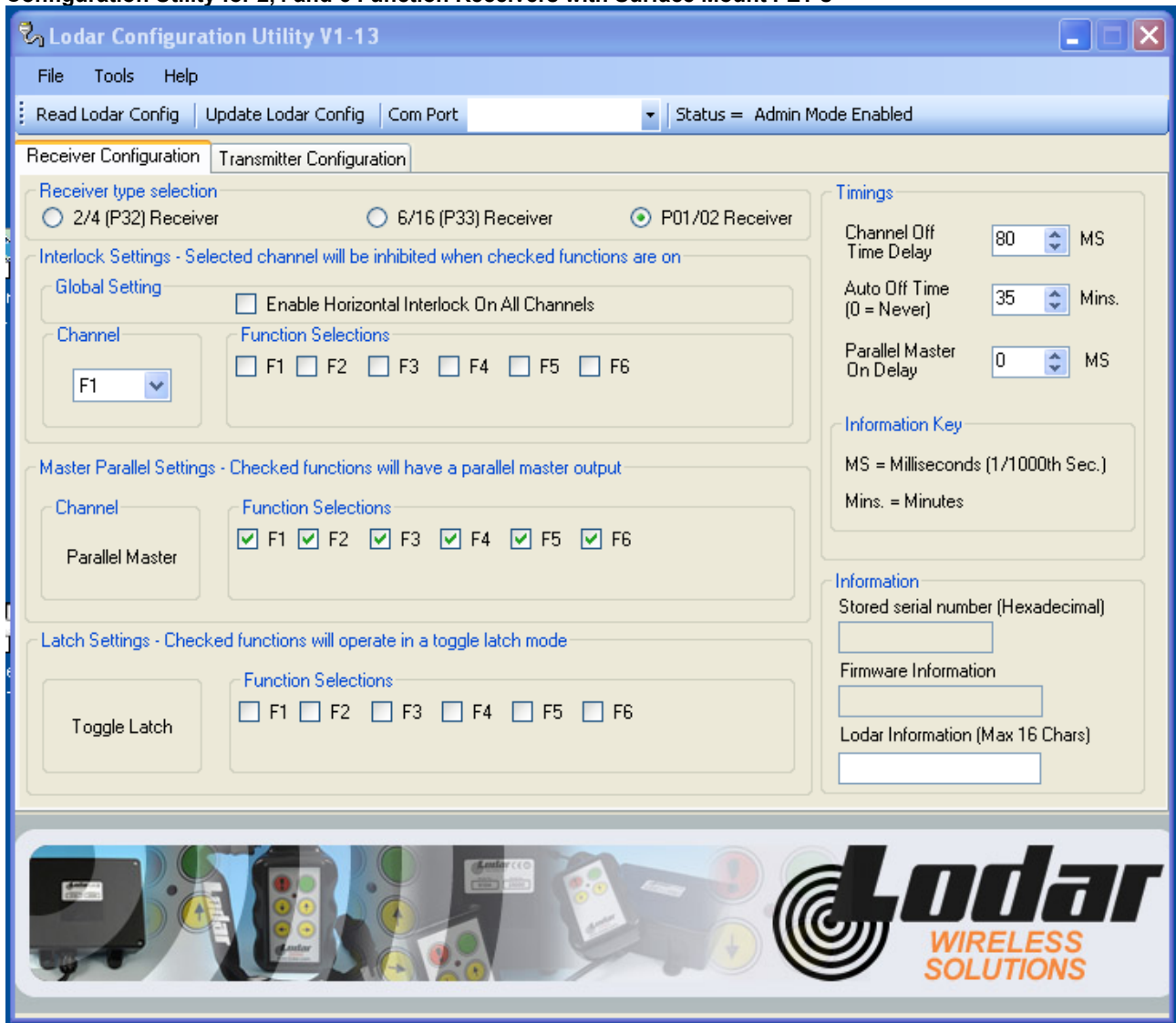
NEW FEATURES

Radio button de-latching
A radio button de-latch, is a form of interlock, mainly used with latched outputs. For example if output F1 is latched on when a signal is received to latch F2, then F1 will be de-latched and F2 latched, like the buttons on a radio when changing station. The output of the function initiating the "de-latch" does not have to be a latch it can be momentary, or no output at all.

Button Allocation
This is easy to explain with a keypad as an example.
F1 and F2 extend the front legs, F3 and F4 retract them.
F5 and F6 extend the rear legs, F7 and F8 retract them.
F9 extends all legs and F10 retracts all legs.

At the receiver connections are made to outputs F1 through to F8 and no connections are made to outputs F9 and F10. Instead outputs F1, F2, F5 and F6 are allocated to energise when an F9 transmitted signal is received, likewise outputs F3, F4, F7 and F8 are allocated to energise when an F10 transmitted signal is received.

This ability to allocate outputs to a given transmitter function is extremely useful, since hard wiring would involve extra wiring and diodes, which is time consuming and hence expensive.

It is important to remember when allocating a number of outputs to one function, that the maximum current that Lodar can switch is 15 Amps; having said that a typical solenoid coil draws 2 Amps approximately, that is a total of 8 Amps in this case. No problem.
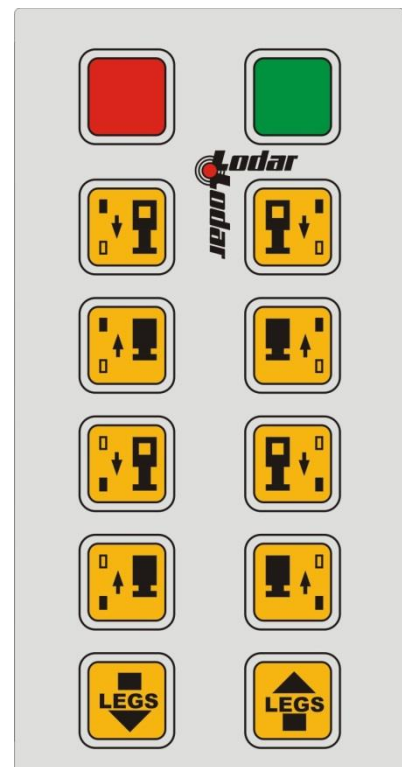
Transmitter configuration
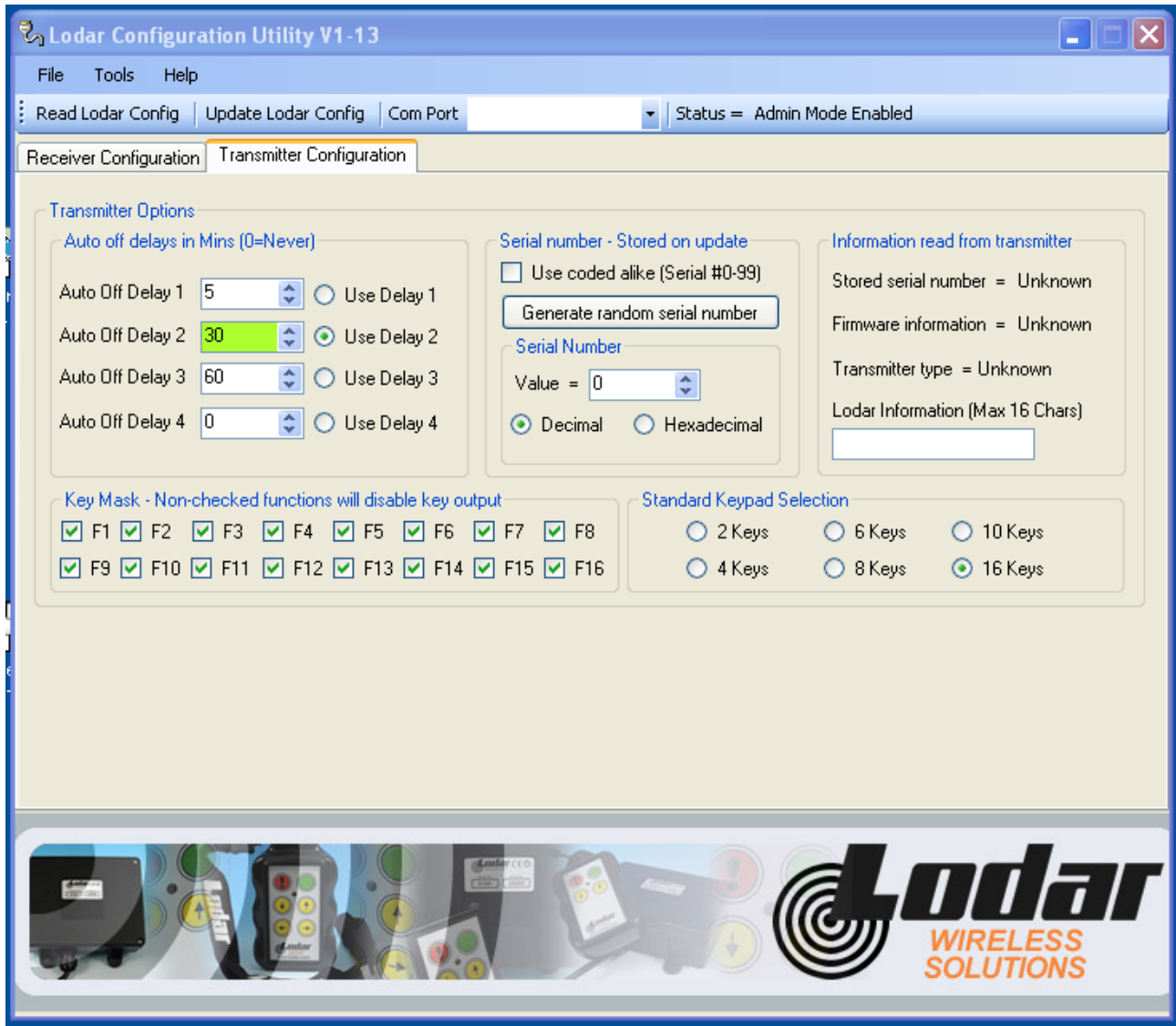
Transmitter time out
The transmitter "time out" can be altered anywhere between the following limits: -

0	equals NO TIMEOUT
30	the standard setting when receiver leaves the factory
255	equals 255 minutes, this is the maximum timeout other than no timeout

Note When the transmitter "times out", just before it switches off it sends a STOP signal to the receiver, so timeout needs to be set on both the transmitter and the receiver.

Adjustment of the transmitter "timeout" using its' keypad only.

The options available are: -
5 minutes, 30 minutes (this is the factory setting), 60 minutes and no time out.

To do this, remove the battery cover and the battery. Position the transmitter so that it is possible to press function buttons F1 and F2 at the same time, and then reconnect the battery. This forces the transmitter into programme mode, release F1 and F2 buttons. If the transmitter has factory set TIMEOUT, then the LED will flash twice then pause then flash twice again, etc, this indicates 30 minute timeout. To adjust the timeout, press button F1 once this will decrease the time to 5 minutes, and the LED will flash once then pause, and then flash once, etc. To increase the timeout press button F2.

Transmitter LED flashes to indicate the following: -

TIMEOUT	Flashes of the LED
5 minutes	One flash, pause then repeat
30 minutes	Two flashes, pause then repeat
60 minutes	Three flashes, pause then repeat
No timeout	Four flashes, pause then repeat

Serial number stored on update
This feature writes the number in the "value" box to the transmitter when the update button is clicked, and is used for generating coded alike transmitters.

Key mask
This disables none checked buttons, and is useful when using a 10 function transmitter as a 7 function, for example, with a 6 function receiver where the master is not required (the 7th output).

Instructions for using Lodar Config. V1.6

1:      Take a 2 way connector; put a link wire between the 2 connections (short circuit)

2:      Fit this 2 way connector in the "**Stop -**" socket on the Receiver PCB.
        P01 = 9200/02 and 04 (9300/02 and 04) RX
        P02 = 9206 (9306) RX
        P04 = 9210/16 and 20 (9310/16 and 20) RX
        P01, P02 and P04 are the current surface mount FET PCB's

3:      Connect power to the Receiver PCB, the fault LED should stay on continuously

4:      Fit the 4 way RS232 programming lead to the 4 way RS232 header on the RX PCB
        Make sure that this is connected to the Serial adaptor which is plugged into the computer USB socket.

5:      Run the Lodar configuration software.

6:      Load the file you wish to program, or make changes (will require "Admin Mode").

7:      Select the appropriate RX model P01/02 or P04
        (This may be incorrect if an older model file has been loaded)

8:      Select the "Com Port" that you wish to use to program the RX PCB

9:      Click "Update Lodar Config.", a few seconds should pass and the Status should change to indicate success.

10:     Remove PC cable and Stop connector, the RX unit will now be ready for use.