USER MANUALS

Tuner4TRONIC Production 4 (T4T-P4) - User Manual

Set up T4T-P4, program drivers from Production Files, read and clone drivers, inspect monitoring data, and configure label printing.

Updated 2026-10-25

Tuner4TRONIC Production 4 (T4T-P4) - User Manual



This manual is based on the July 2024 Tuner4TRONIC Production 4 user manual.

Please note

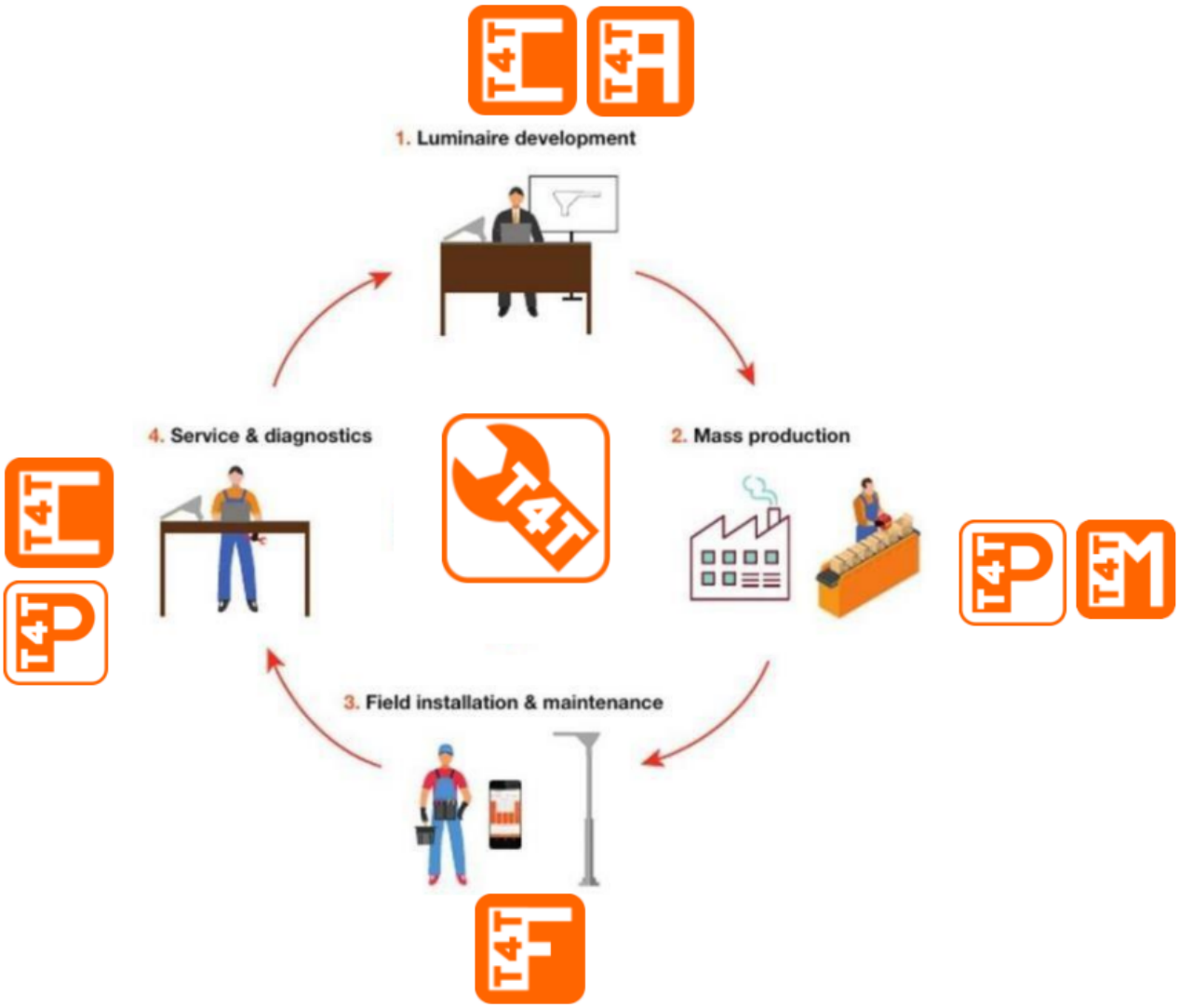
All information in this guide has been prepared with great care. Inventronics, however, does not accept liability for possible errors, changes and/or omissions. Please check www.inventronicsglobal.com or contact your sales partner for an updated copy of this guide.

This technical application guide is for information purposes only and aims to support you in tackling the challenges and taking full advantage of all opportunities the technology has to offer. It is based on Inventronics' own measurements, tests, specific parameters and assumptions. Individual applications may not be covered and may need different handling. Responsibility and testing obligations remain with the luminaire manufacturer/OEM/application planner.

1 About Tuner4TRONIC

1.1 Purpose and application

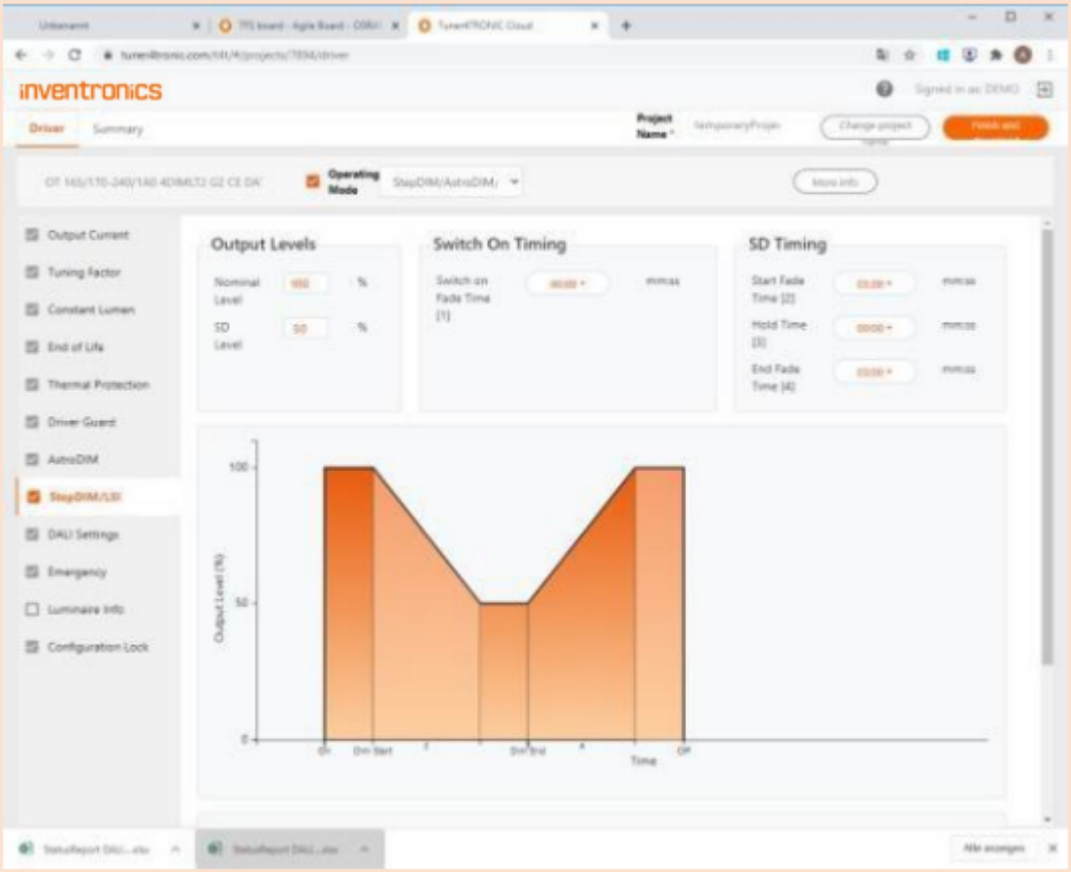
The Tuner4TRONIC (T4T) software suite allows luminaire manufacturers to program Inventronics drivers via DALI and/or NFC in a simple, fast, reliable and cost-effective way, speeding up production. Download the tools from the Inventronics Tuner4TRONIC page.

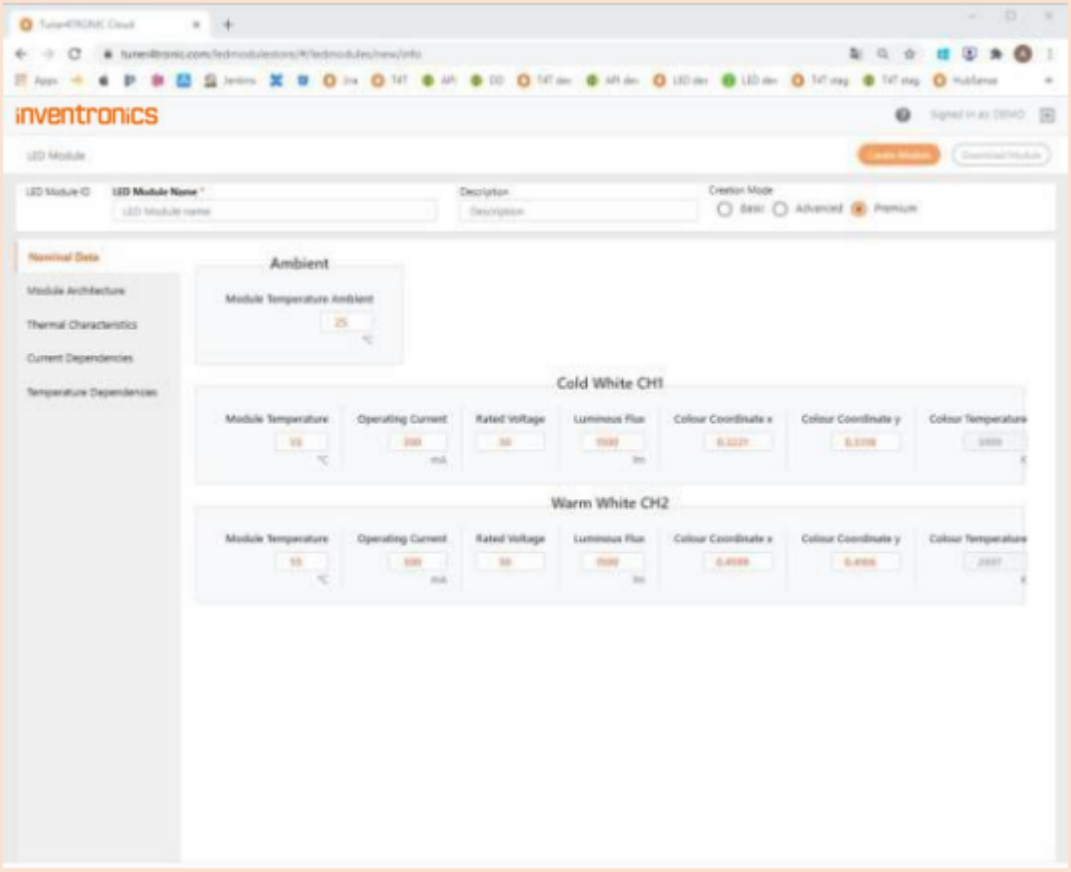


Tuner4TRONIC Configurator

This browser application lets luminaire designers configure LED driver output current, dimming levels, constant lumen output (CLO), operating modes and other parameters. Its multi-level password system, Configuration Lock, protects drivers against unauthorized changes while granting service technicians access to selected features.

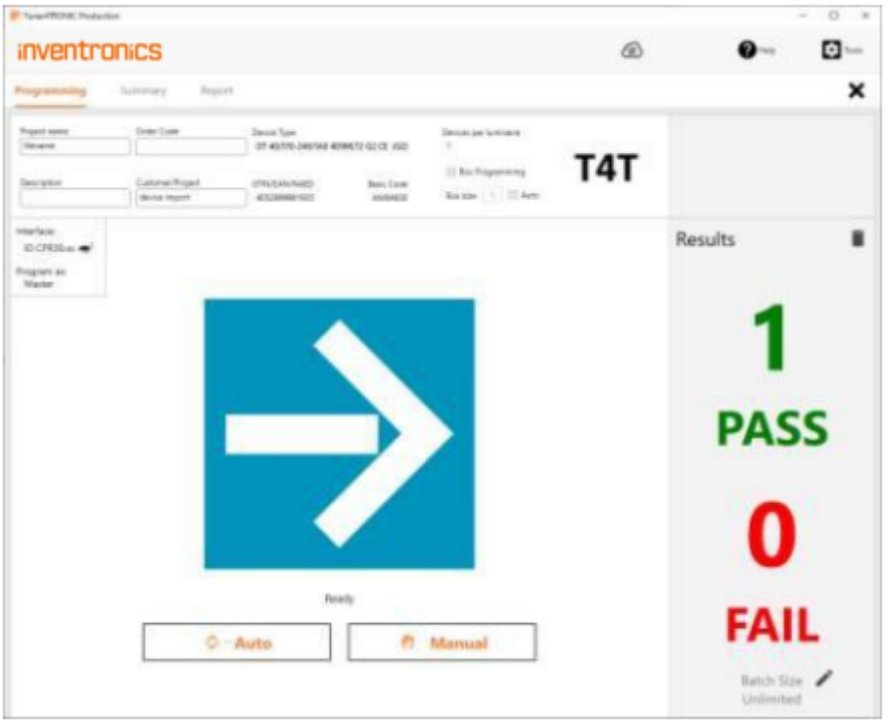
Export the completed settings as an encrypted, read-only Production File and send it to the production line. The Tuner4TRONIC website also provides a TW LED Module Editor for customized tunable-white LED module settings.


inventronics
Driver
Summary
Output Current
Tuning Factor
Constant Lumen
End of Life
Thermal Protection
Driver Guard
AstroDIM
StepDIM/LSI
DALI Settings
Emergency
Luminaire Info
Configuration Lock
Output Levels
Switch On Timing
SD Timing
Time


inventronics
LED Module
Ambient
Cold White CH1
Warm White CH2

Tuner4TRONIC Production

Upload encrypted Production Files from T4T Configurator into LED drivers for fast mass production. T4T Production also reads driver data for display and editing in T4T Configurator.



Tuner4TRONIC Field

This smartphone app programs indoor and outdoor Inventronics LED drivers via NFC, wirelessly and without mains voltage. It adjusts light output, CLO and dimming profiles, uploads Production Files created by T4T Configurator, and copies data between drivers for on-site replacement.



See the Field App user manual for details.

Tuner4TRONIC REST API

The REST API gives software developers functions and tools to create luminaire configurations automatically, for example when a new order becomes available in an ERP system. It comes with comprehensive documentation.

Tuner4TRONIC Machine

DLL and command line tools integrate LED driver programming into automatic programming stations in the production line.



See the T4T-CMD 4 user manual for command line operation.

1.2 File types

File type	Extension
Tuner4TRONIC Production File	`.osrtup`
Driver description file	`.osrtud`
Driver readback data	`.osrtur`

1.3 Workflow between T4T tools

1. Create the desired configuration, such as operating current, CLO and dimming, in T4T Configurator.
2. Create and download a read-only `.osrtup` Production File for T4T Production on the assembly line.
3. For testing and diagnostics, read data back from the driver in T4T Production and import the `.osrtur` file into T4T Configurator for visualization.

The optional API creates luminaire and Production Files directly from an ERP system, removing the need to create them manually.



1.4 System requirements

Minimum requirements listed in the July 2024 manual:

- 1 GB main memory.
- Windows 8, Windows 8.1 or Windows 10, 32-bit or 64-bit, with the latest service pack installed.
- 200 MB hard disk space.
- Monitor resolution of 1024 × 768 pixels; recommended zoom factor: 100%.
- One free USB 2.0 port for the programming interface.

1.5 Programming interfaces

Use an interface suitable for the driver to be programmed.

Driver interface	Programming hardware
DALI	DALI Magic for single and/or multiple programming.

Driver interface	Programming hardware
NFC	FEIG ISC.PRH101, CPR30, ISC.MR102, ISC.LR1002 or ID ECCO Smart HF.BLE.
DA+(P+)/DA-(P-)	PRG-MUL2.

The ISC.MR102 requires a separate ISC.ANT310/310 antenna. The ISC.LR1002 requires a separate ISC.ANT310/310 or ISC.ANT800/600 antenna.

The ID ECCO Smart HF.BLE has FEIG order code **5738.000.00**. Its Bluetooth connection requires the ID BLE USB-Dongle, FEIG order code **5903.000.00**.

[1]	Driver with DALI interface (multi and/or single programming)	DALI Magic	
[2]	Driver with NFC interface	FEIG ISC.PRH101	
		FEIG CPR30	
		FEIG ISC.MR102 (separate antenna ISC.ANT310/310 needed)	
		FEIG ISC.LR1002 (separate antenna ISC.ANT310/310 or ISC.ANT800/600 needed)	
		ID ECCO Smart HF.BLE FEIG order code: 5738.000.00 ID BLE USB-Dongle FEIG order code: 5903.000.00 required for BT connection w/ ECCO Smart	

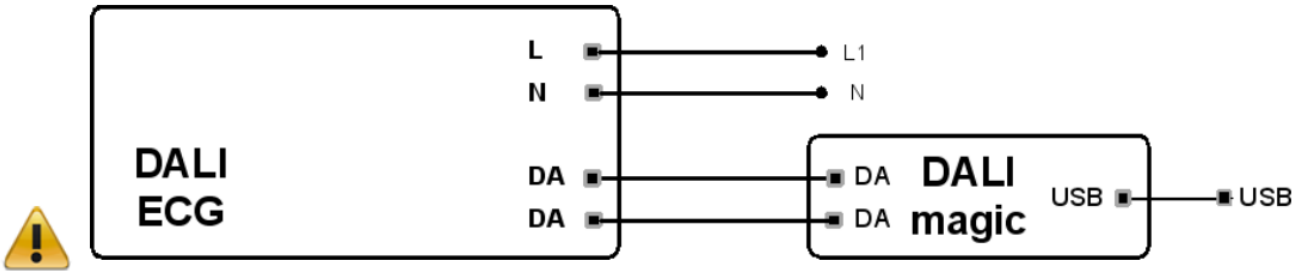
[3]	Antenna with FEIG ISC.LR1002	FEIG ISC.ANT310/310	
[4]	Driver with DA+(P+)/DA-(P-) interface	PRG-MUL2	

T4T Production can handle more than one programming interface connected to the same PC.

1.6 Prepare a driver with a DALI interface

1. Connect DALI Magic to the PC with the supplied USB cable.
2. Connect its external 6 V DC power supply. This is mandatory with more than four drivers on the DALI line and is strongly recommended in all cases for communication stability.
3. Connect the driver to mains and protective earth (PE), if the driver has a PE terminal.
4. Connect DALI Magic's DALI terminals to the driver's DALI inputs.

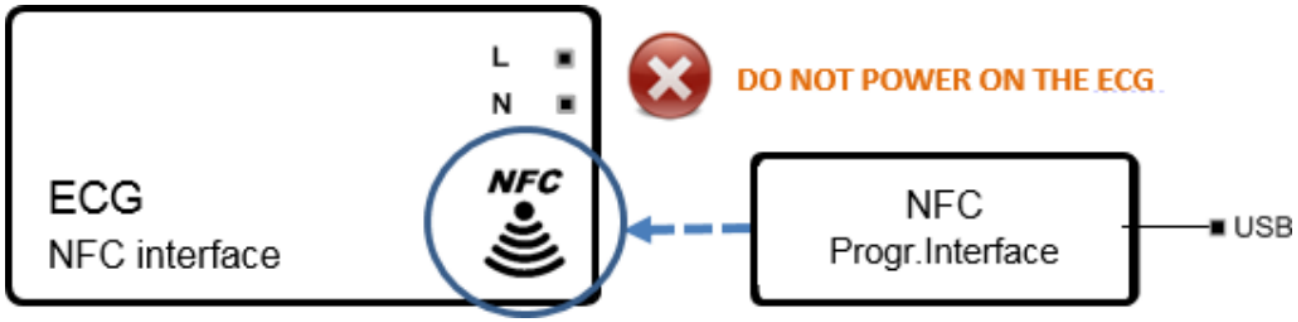
Most DALI LED drivers allow programming with a low-voltage supply, such as 48 V, instead of mains voltage. Consult the driver's datasheet for details.



1.7 Prepare a driver with an NFC interface

1. Connect the NFC reader to the PC with the supplied USB cable.
2. Place the driver's NFC area, identified by the logo on the driver, close to the NFC reader.

> **Important:** Keep the driver powered **OFF** during NFC programming unless its documentation states otherwise. Keep the NFC reader and driver in close contact throughout programming.



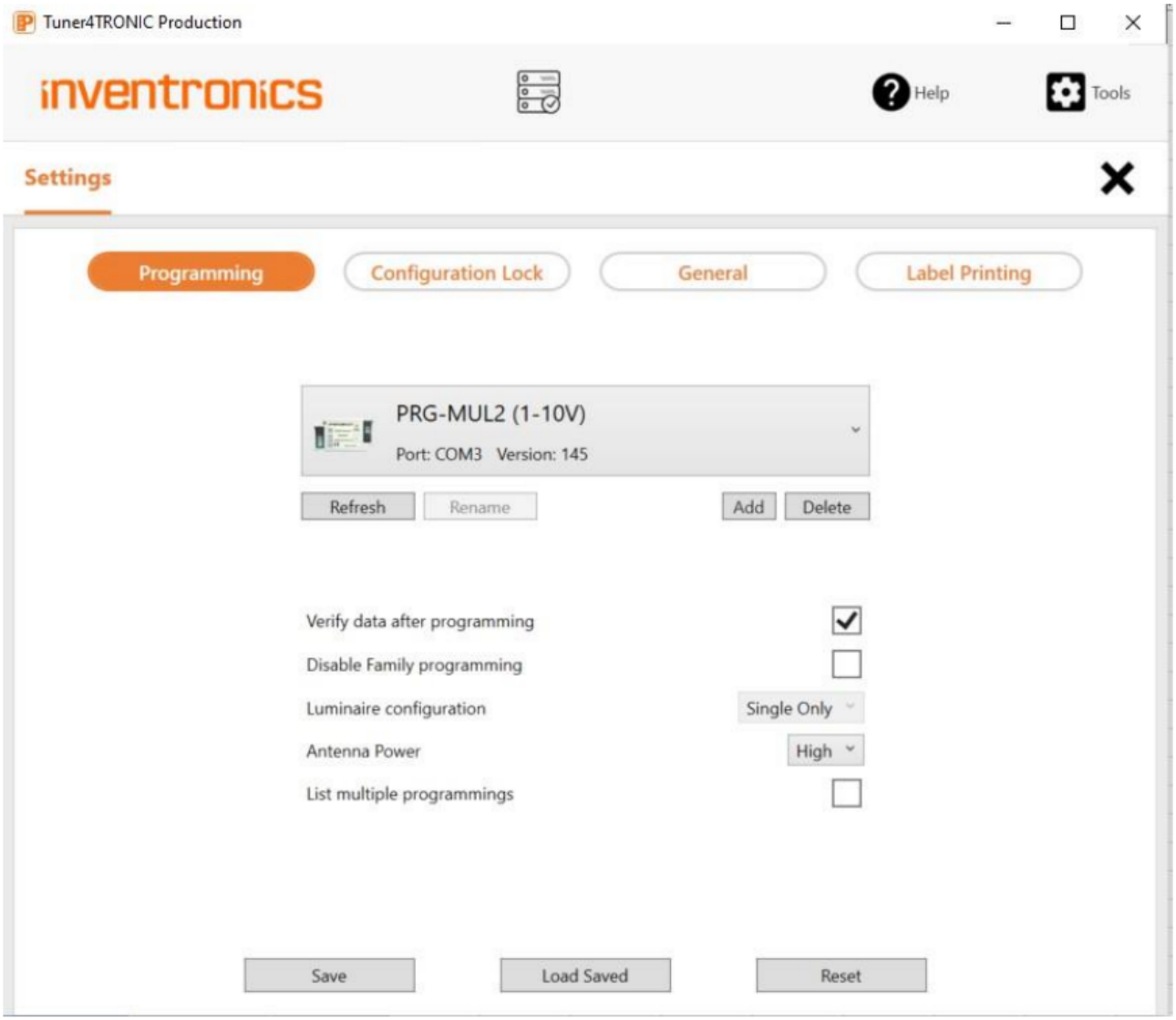
1.8 Prepare a driver with a Prog+/Prog- interface

1. Connect the OT Programmer to the PC with a USB cable.
2. Connect its + and - terminals to the driver's corresponding Prog+ and Prog- terminals or cables.

> **Warning:** Do not power on the driver. Programming through Prog+ and Prog- is not permitted while mains is connected to terminals L/N.

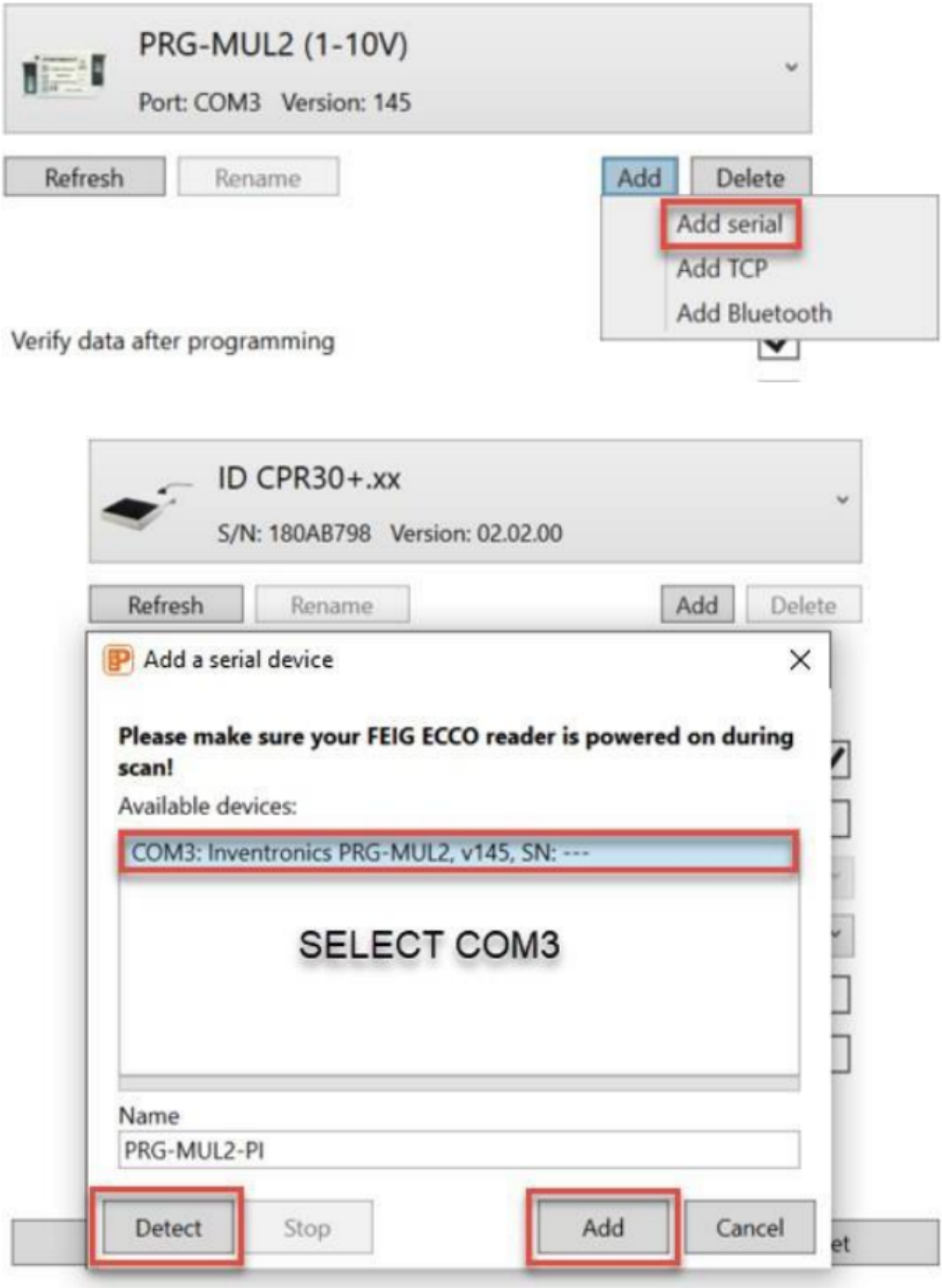
1.9 Prepare a driver with a DA+(P+)/DA-(P-) interface

1. Connect PRG-MUL2 to the PC with a USB cable.
2. Connect **DA-(P-)** to **Return (grey)**, **DA+(P+)** to **Programming (purple)**, and **Vaux/Aux+** to **Vaux (black/white)**.
3. Open T4T-P4.x, then **Tools > Settings > Programming**.
4. If PRG-MUL2 has already been added, select it from the drop-down list.

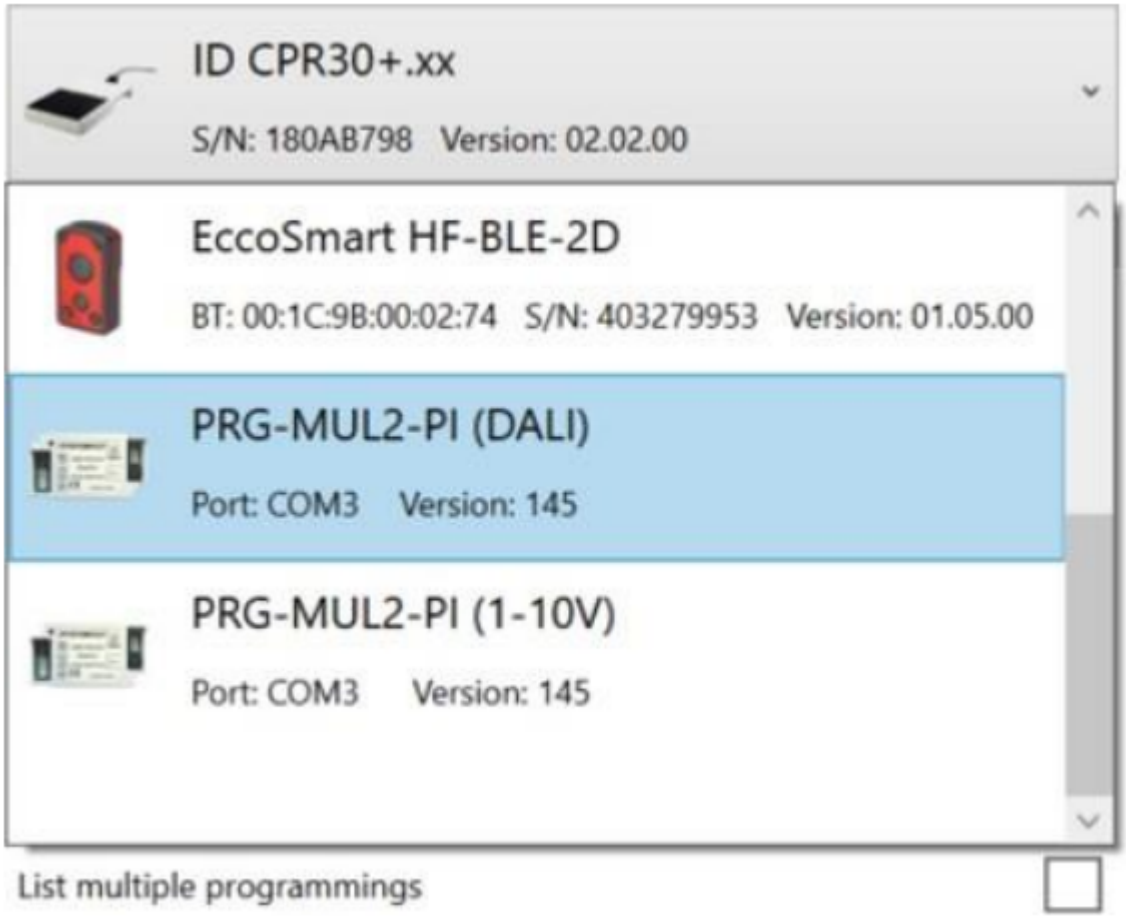


To register a new PRG-MUL2:

1. Open **Add > Add Serial**.
2. Click **Detect**.
3. Select the correct COM port, for example `COM3: Inventronics PRG-MUL2, v145`.
4. Confirm with **Add**.



The device is now registered in the list of programmers. Select the mode appropriate to the programming method: **PRG-MUL2-PI (DALI)** or **PRG-MUL2-PI (1–10V)**.



> **Warning:** Do not power on the driver. Programming through this connection is not permitted while the driver is supplied with mains.

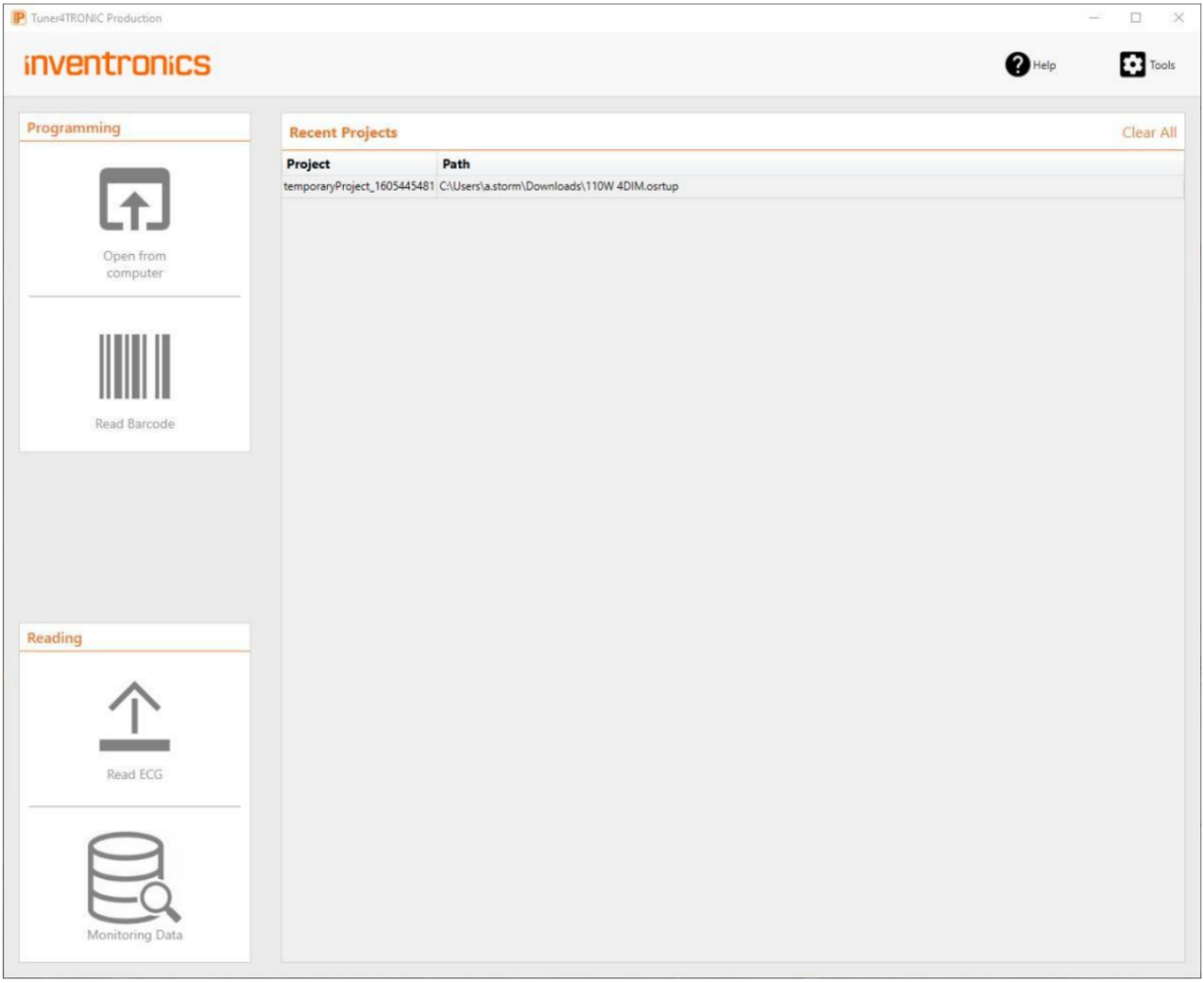
1.10 Software installation

Windows administrator rights are required.

1. Extract the Tuner4TRONIC ZIP file to a local folder with a short path, such as `C:\temp`.
2. Run `Install T4T.exe` from that folder. Running the installer from inside the ZIP file causes a faulty installation.
3. Launch T4T Production from **Start > Tuner4TRONIC 4**, or double-click its desktop icon.

2 Using T4T Production

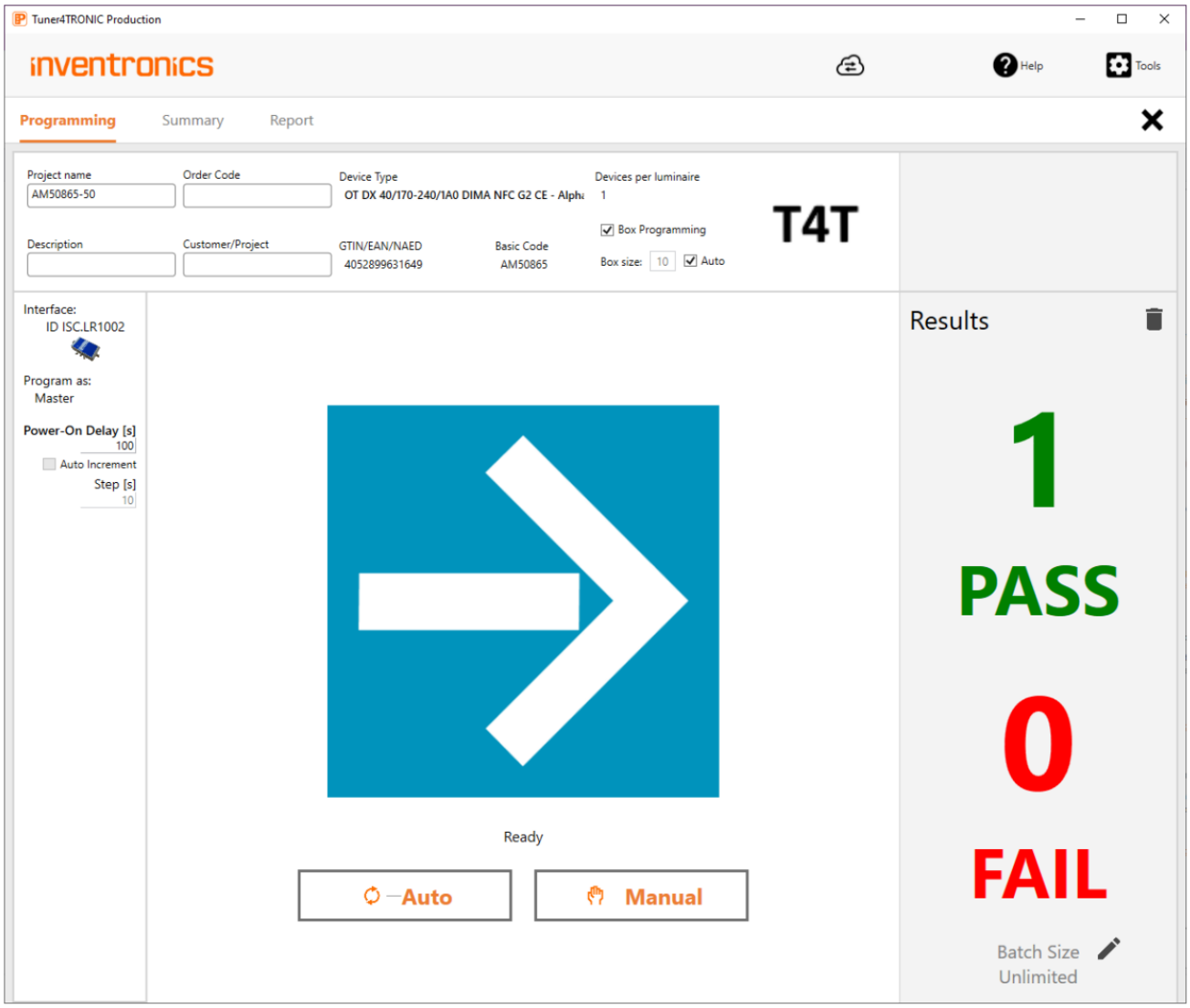
2.1 Start page



Control	Function
Open from computer	Load an existing `.osrtup` Production File created by Tuner4TRONIC Cloud, API or Development. The application then opens the Programming page.
Read Barcode	Load a Production File from a barcode.
Read ECG	Read data from a driver connected through a programming interface.
Monitoring Data	Read and display driver monitoring data (PMD, D4i).
Recent Projects	Double-click a recently opened project to load it. Clear the list with Clear All.
Tools	Open the tools page.
Help	Open help and about pages.

2.2 Programming page

Select **Programming** on the navigation bar to program devices.



Area	Function
Project Data	Display and edit project data loaded from the Production File.
Devices per Luminaire	Display the number of devices in the luminaire from the Production File.
Detected Devices	Display the number of detected drivers after a programming button is pressed.
Interface	Display the connected programming interface.
Status	Show a status symbol, completion bar and text message.
Results	Display passed and failed programming events.

Box programming

Select **Box Programming** to program drivers in a box via NFC. This requires a suitable programming interface. If the driver is released for box programming, the **Auto** checkbox fills in the number of drivers by default. The default is loaded from the Production File and can be edited. Programming starts only when the detected number matches the target number.

If verification fails for one or more drivers, all drivers in the box are marked as failed. Program the whole box again. Reprogramming drivers with the same Production File overwrites their report entries without increasing the total number of passes.

Start programming and results

- **Manual:** Program drivers in one luminaire or one box.
- **Auto:** Start programming when drivers connect to the interface. Continue until the batch size is reached. In box mode, start when the identified driver count matches the box size.

By default, if the same driver is programmed repeatedly, only its latest pass/fail result is counted and logged in the Production File. View the log on the **Report** tab.

Use the **delete** icon to clear the report in the Production File and reset the counter. Use the **edit** icon to change the batch size. The **List multiple programming events** setting described in section 2.8 changes how repeated programming is counted.

Programming role

Program as displays the role defined in the Production File:

Role	Access
Master	All features, provided the master key matches the target device.
Service	Features protected by the service key, provided it matches, and non-protected features.
User	Non-protected features only.

Power-on delay

If enabled in the Production File, **Power-On Delay** displays the delay in seconds. Edit the value to override it. Select **Auto Increment** and enter a step size in seconds to increase the delay after each programming operation. Auto Increment is unavailable with box programming.

Additional DALI options

Single-driver programming: With DALI Magic selected, program one connected driver compatible with the Production File, or read data from any single driver. If the driver differs from the Production File, T4T-P uses the online or offline family programming service. DALI addressing follows the file's settings: keep the address when addressing is disabled, unassign it, or assign a new address.

Batch programming: With multiple drivers on the DALI line, program all compatible drivers using family programming. DALI addresses are deleted after programming. Production Files with DALI Addressing enabled are rejected for batch programming.

Selective programming: Enable **Selective Programming** to program specific drivers identified by DALI short addresses. Click **Search** to scan the installation. Compatible drivers are highlighted in green; select their checkboxes. Select **blink** to identify a luminaire physically.

Enter short addresses separated by commas; ranges such as `2-9` are also accepted. The DALI bus is scanned before programming to avoid duplicate addresses.

Selective programming is rejected for drivers in multi-channel operating mode. It cannot switch the operating mode of multi-channel drivers; use NFC or connect a single driver instead.

Online services

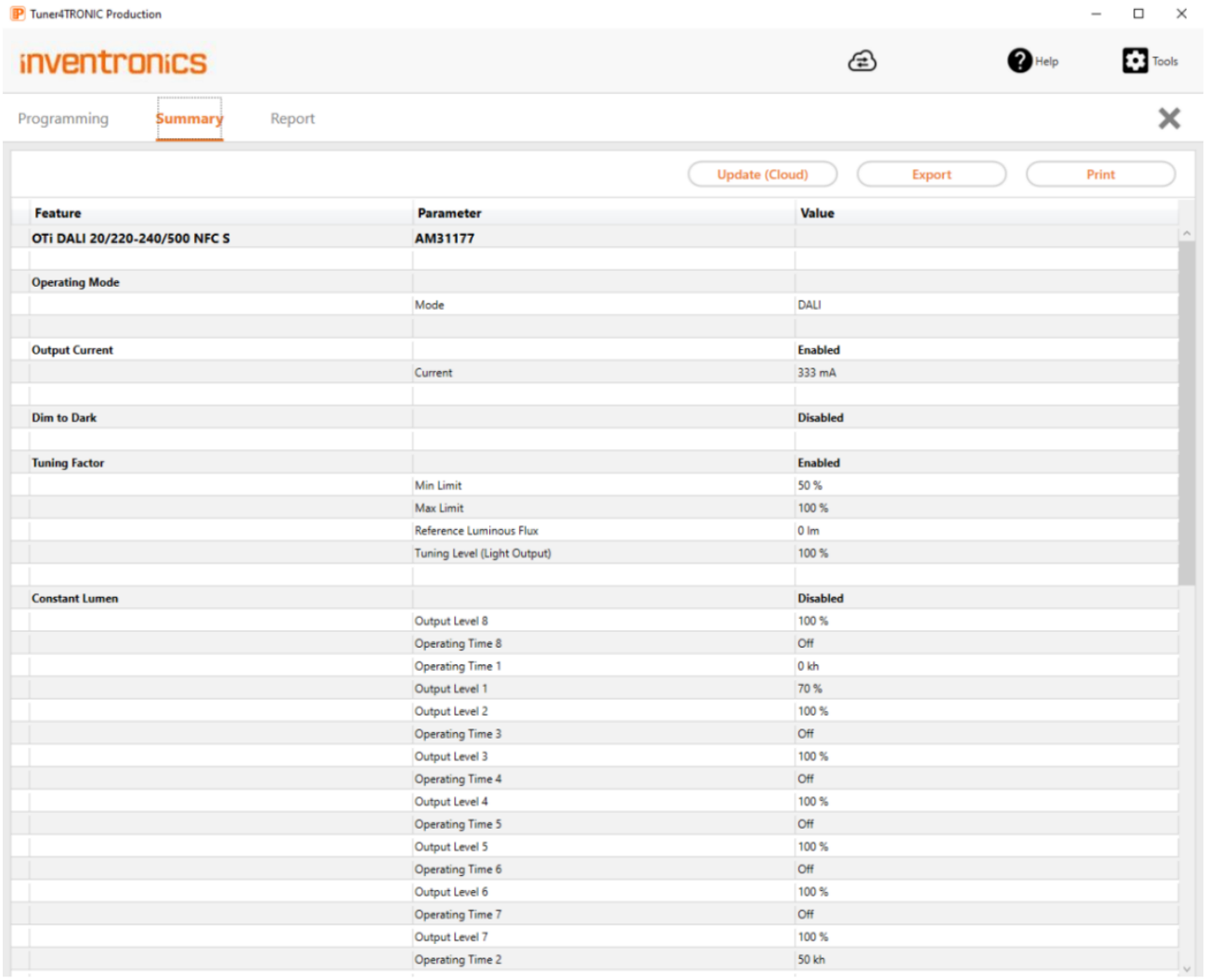
The cloud icon indicates that online services are connected. These services automatically update device description files with the latest drivers from DD-store and notify users of T4T-P updates.

Programming status indicators

Status	Meaning and action
Waiting for Luminaire	Connect a luminaire or drivers to start or continue programming.
Programming in progress	Do not remove the connected luminaire or drivers until programming completes.
PASS	Programming completed successfully. Remove the luminaire or drivers.
FAIL	Programming stopped because of user action or an error. Read the on-screen message, fix the problem and restart.

2.3 Summary page

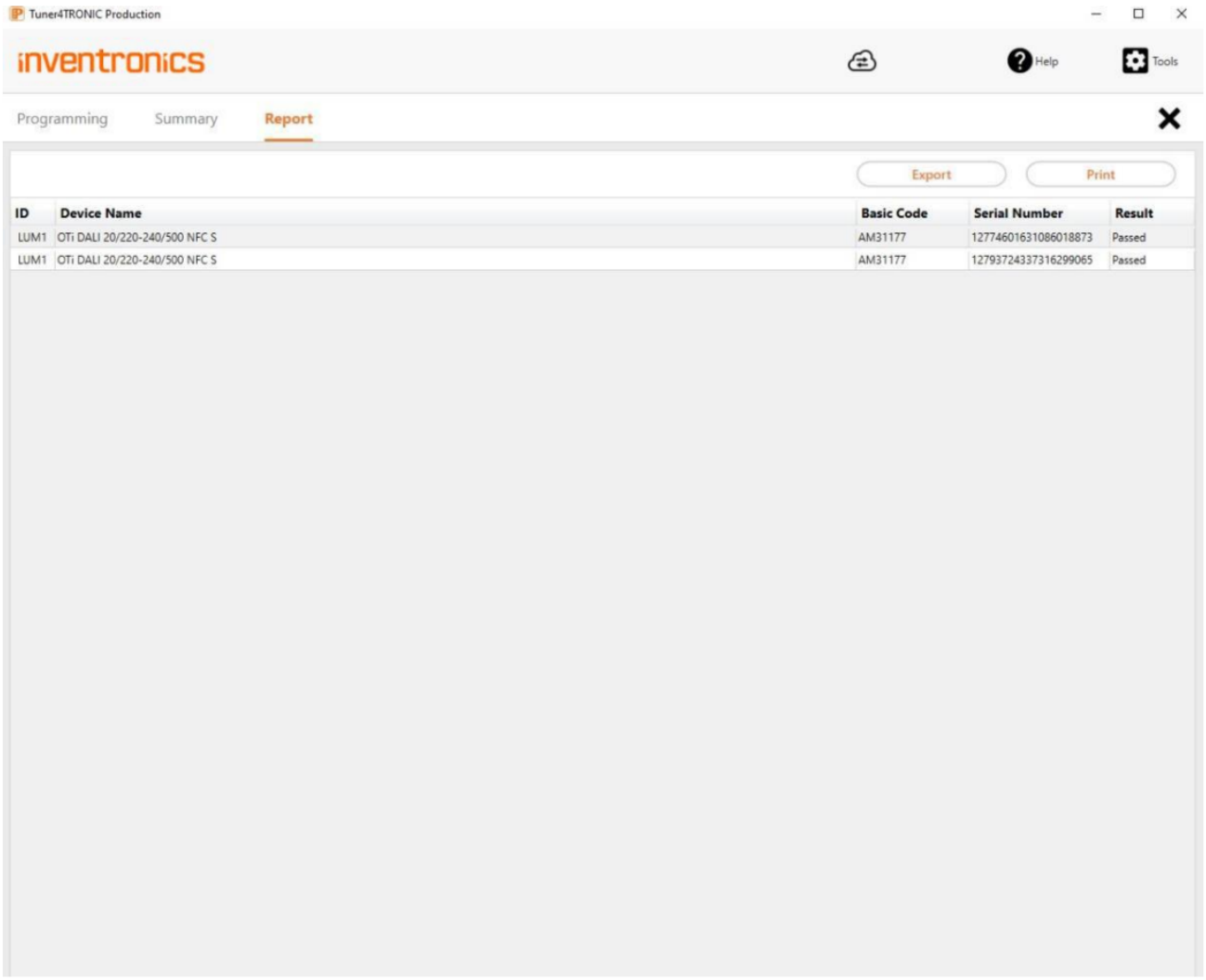
Select **Summary** to display the Production File's parameters.



Control	Function
Update (Cloud)	Use cloud services to convert report values into clear text when the Production File does not include a clear-text report.
Export	Create an HTML file containing the parameters.
Print	Print the parameter list.

2.4 Report page

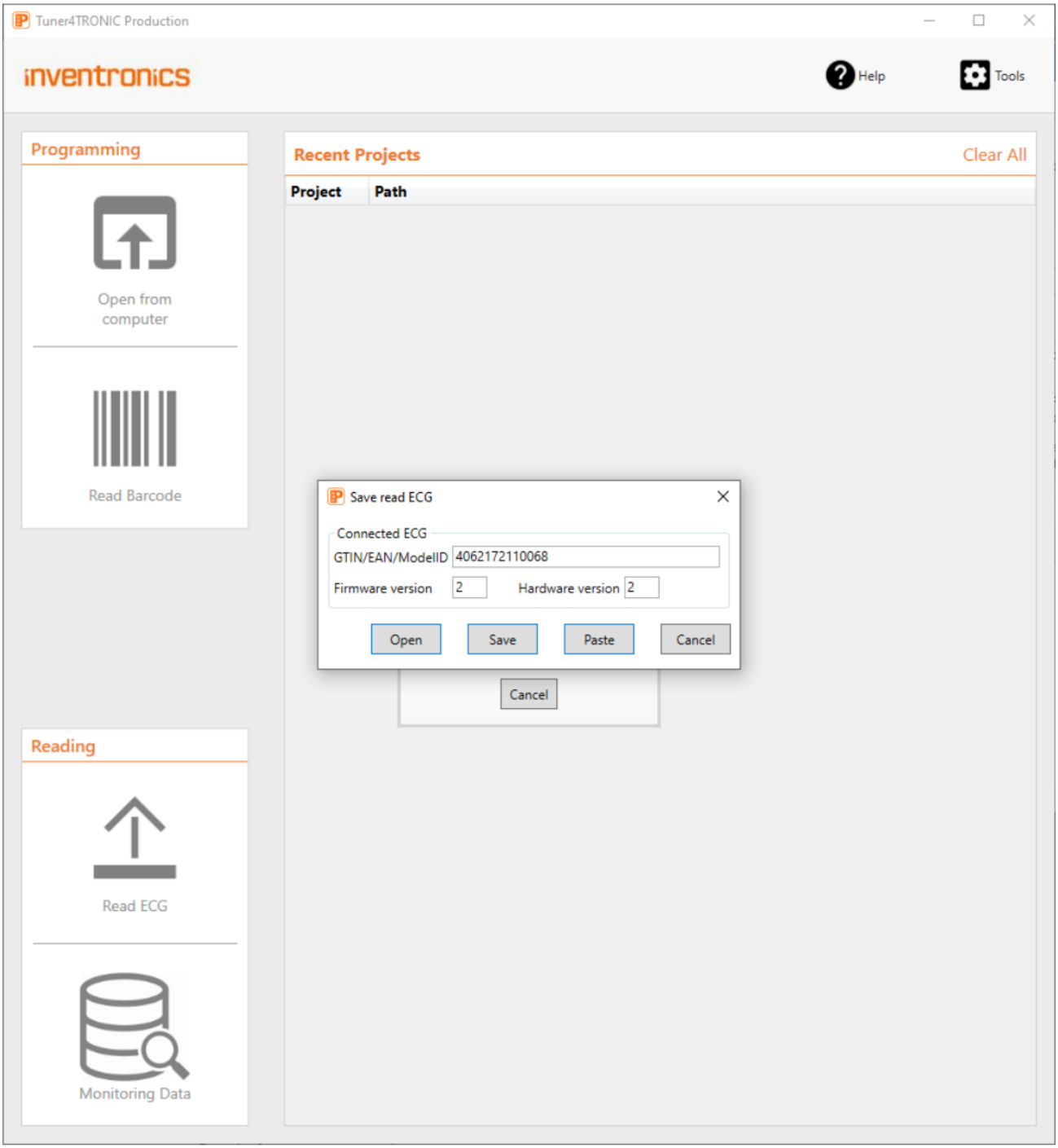
Select **Report** to display the programming report.



Export creates an HTML report with one line for each driver, luminaire or box programming result. **Print** prints the report.

2.5 Read ECG

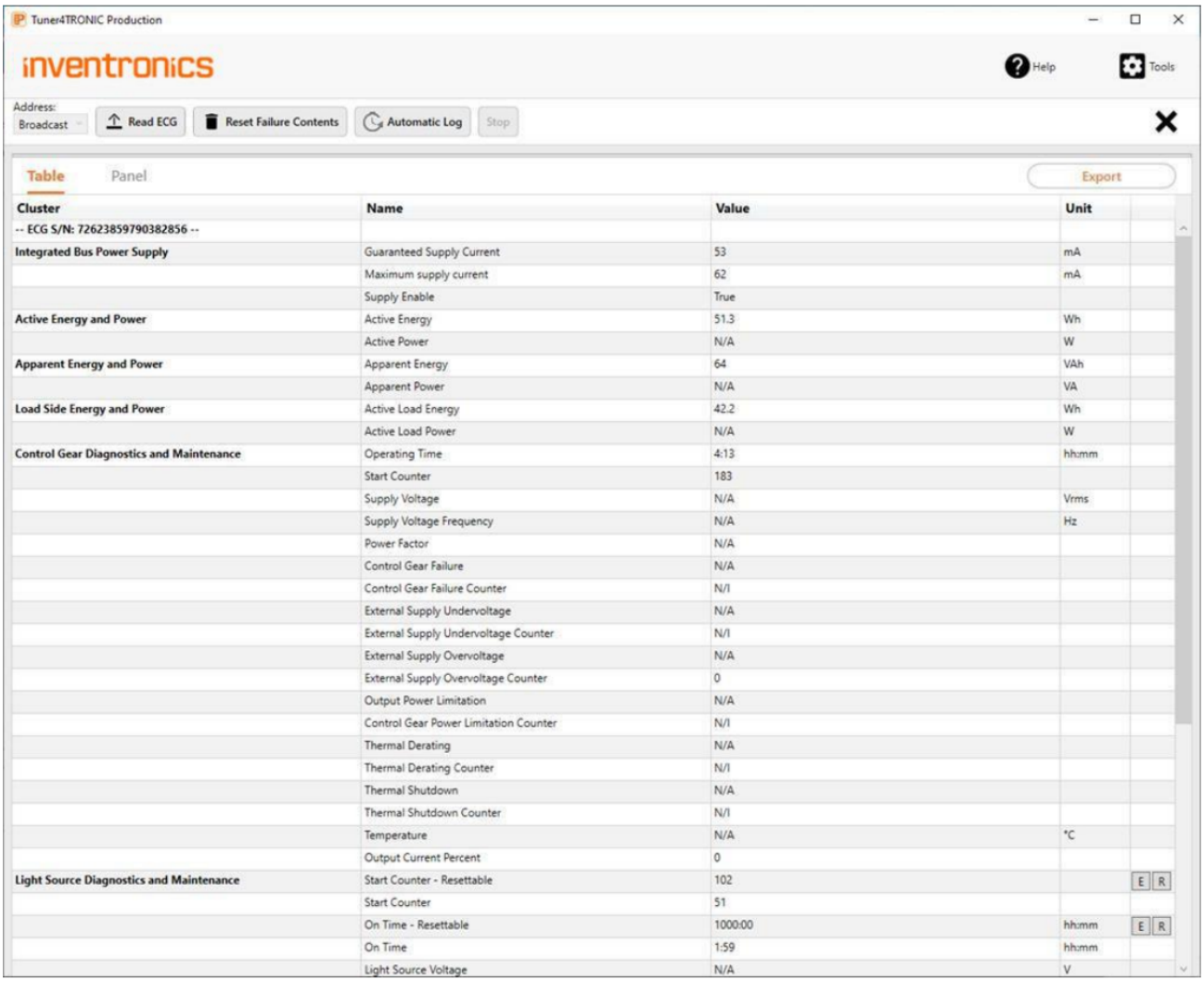
Click **Read ECG** on the start page to read a driver through NFC, DALI or an OT Programmer. With DALI Magic selected, enter a DALI short address to select a specific driver on the network.



Option	Function
Open	Open T4T Configurator in a new tab in the default browser and create a project using the driver data.
Save	Save driver data locally as an `.osrtur` readback file. Import it into T4T Configurator to display data and create Production Files. This is useful while T4T-P4 is offline.
Paste	Create a new Production File from the driver data and import it into T4T-P4 to clone settings, for example when replacing a driver. Requires internet access to cloud services.

Passwords are not retrieved in plain text. The encrypted master password indicates that the driver is protected; passwords must be re-entered when creating a Production File in Configurator. The **Paste** workflow includes a password in the new Production File, hidden from the user, to unlock and protect the new drivers.

2.6 Monitoring data



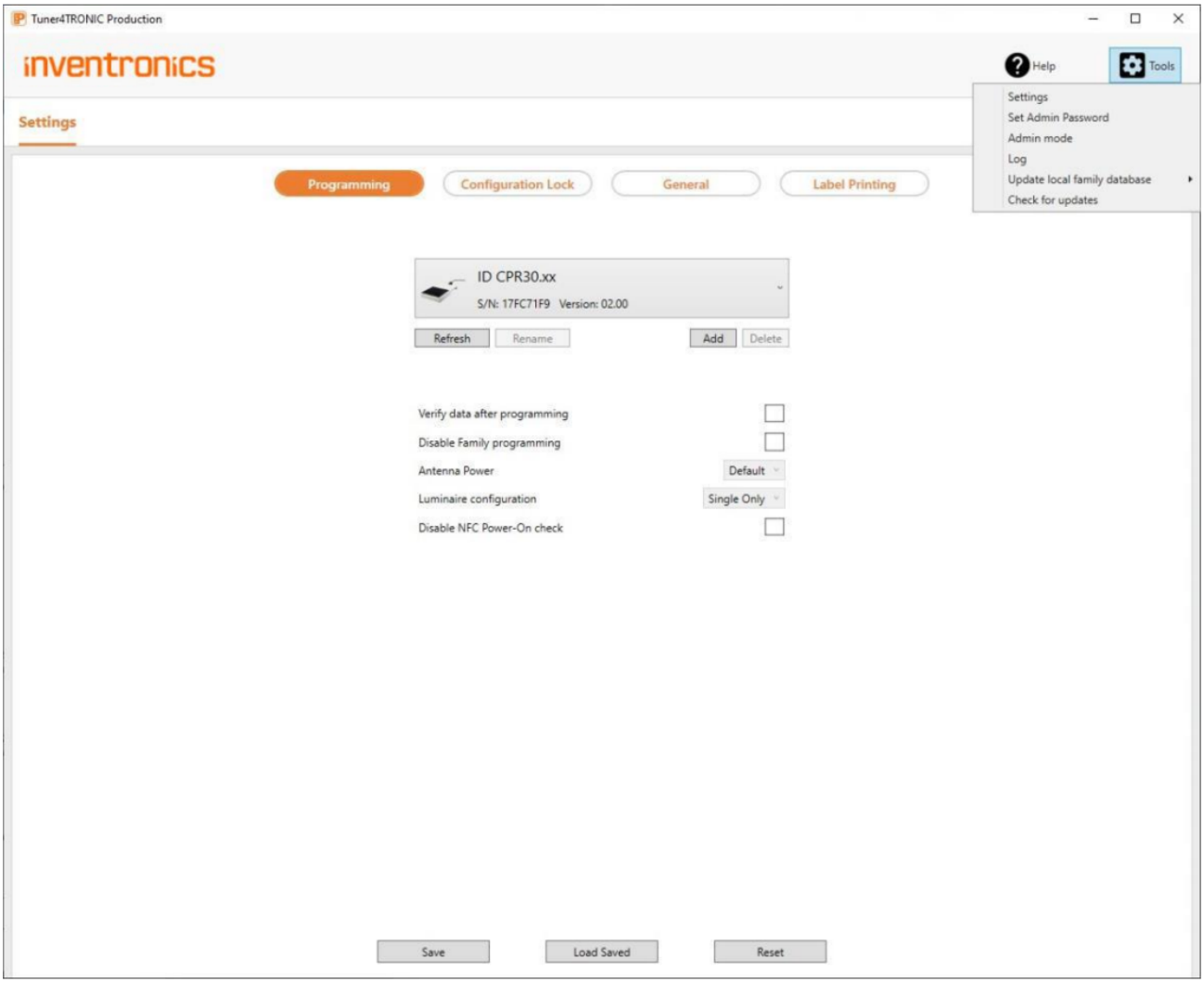
Control	Function
Address	With DALI Magic, use broadcast only when exactly one driver is connected. If several drivers are connected, select one by its DALI short address.
Read ECG	Read monitoring data through the selected programming interface.
Resettables	Press E to edit values or R/the reset control to reset them. Changes take effect after the next driver power-on.
Automatic Log	Repeatedly read monitoring data and log it.
Stop	Stop reading monitoring data.
Table	Display a table view.

Control	Function
Panel	Display a panel view.
Export	Create an HTML file containing the parameters.

The appendix lists Monitoring Data v2 parameters and identifies those available only through DALI.

2.7 Tools page

Click **Tools** and select an entry from the drop-down menu.

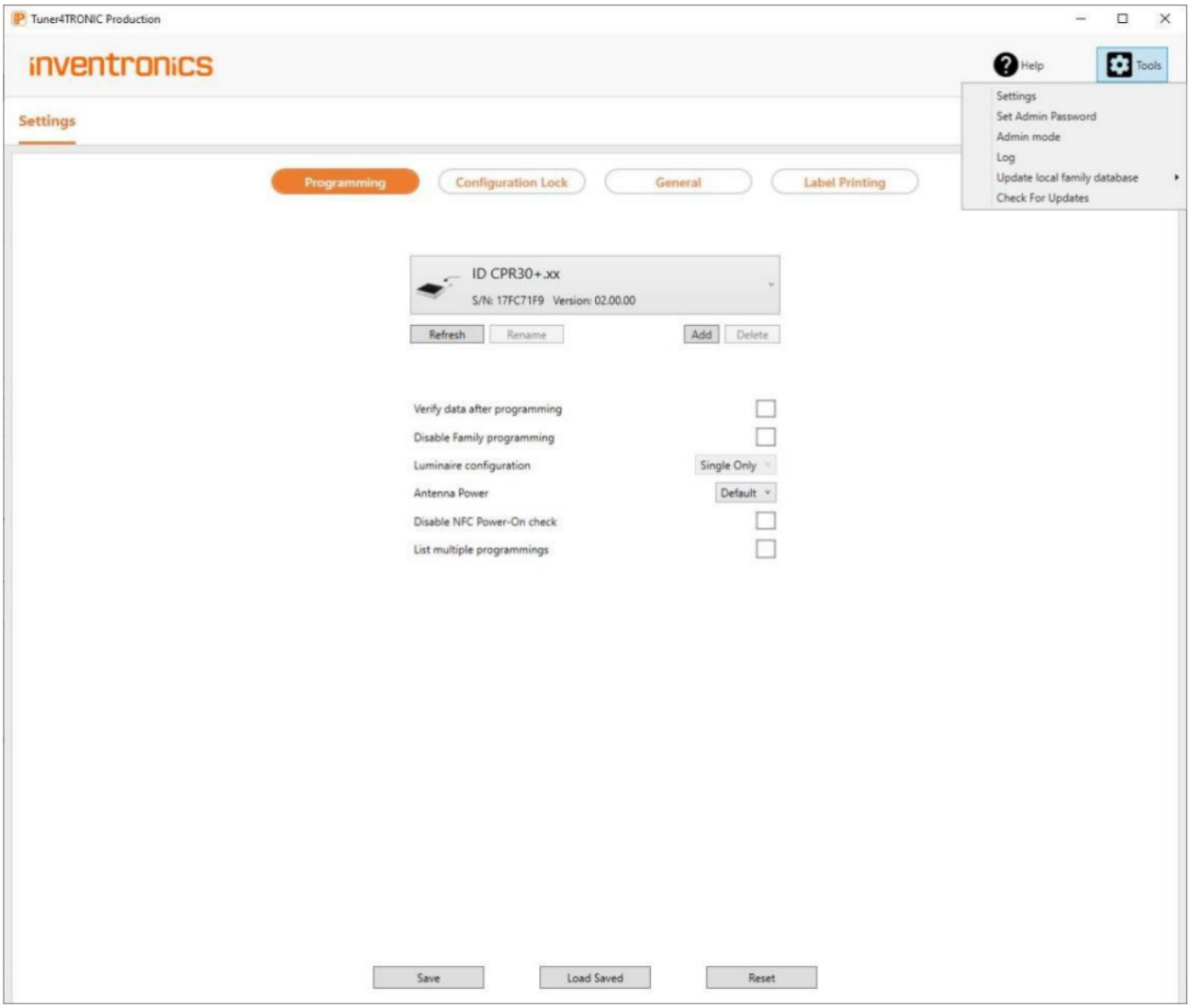


Entry	Function
Settings	Open the settings pages described below.
Set Admin Password	Enter or delete the password for admin mode.
Admin Mode	Toggle admin mode. The source manual states that, when activated, the Production File cannot be reloaded and project data cannot be edited.
Log	Display debugging logs. Right-click the log window to export a CSV log file.

Entry	Function
Update local family database	Update the family programming database from the cloud or a local ZIP file when offline. Download the ZIP from Software Downloads on the Inventronics Tuner4TRONIC page.
Check for Updates	Check the download center for new T4T-P versions. Updates affect T4T-P4 and T4T-S simultaneously.

2.8 Settings - Programming

Open **Tools > Settings > Programming**.



Save, Load Saved and Reset

- **Save:** Save options locally and in the Production File where applicable. Unsaved changes are ignored when T4T-P restarts.
- **Load Saved:** Load options from the local computer and Production File where applicable.
- **Reset:** Restore factory settings and data from the Production File where applicable.

Select a programming interface

Select an interface from the drop-down list. Ensure that it is connected and not used by another tool. Click **Refresh** to refresh the USB interface list.

For interfaces using a COM port, such as OT Programmer, FEIG ECCO with a Bluetooth dongle or PRG-MUL2, click **Add Serial**, then **Detect**. Select a device, assign a name and click **Add**.

For TCP/IP interfaces, such as LR1002, click **Add TCP**, enter the IP address and click **Detect**. Added interfaces remain in the list after restarting the application.

Verify data after programming

Enable automatic verification after every programming operation. The default comes from the Production File.

Disable family programming

Family programming allows a Production File to program drivers in the same family and drivers of the next generation. It does not support previous generations.

Select **Disable Family programming** to reject every driver other than the one specified in the Production File. The default comes from that file.

Family programming uses cloud services. Without internet access, or with cloud services disabled, it uses the service installed locally with T4T-P4. Keep the local database current using the update entry in Tools.

Antenna power

Adjust antenna power to the setup. The source manual notes that FEIG CPR30+ supports higher antenna power for drivers with weak NFC antennas.

Luminaire configuration

Select single or multiple programming. Multiple programming supports several DALI-connected drivers, such as a test rack or a luminaire with multiple drivers. The default comes from the Production File.

Disable NFC Power-On check

Normally T4T-P4 rejects NFC programming while the driver is connected to mains because NFC data may be corrupted. In the worst case, programming can be acknowledged even when data was not programmed correctly. Drivers use a power-on flag in their NFC tags to indicate that they are powered.

The source manual describes production lots where this flag was set incorrectly despite the driver being disconnected from mains. Disabling the check allows these drivers to be repaired by programming.

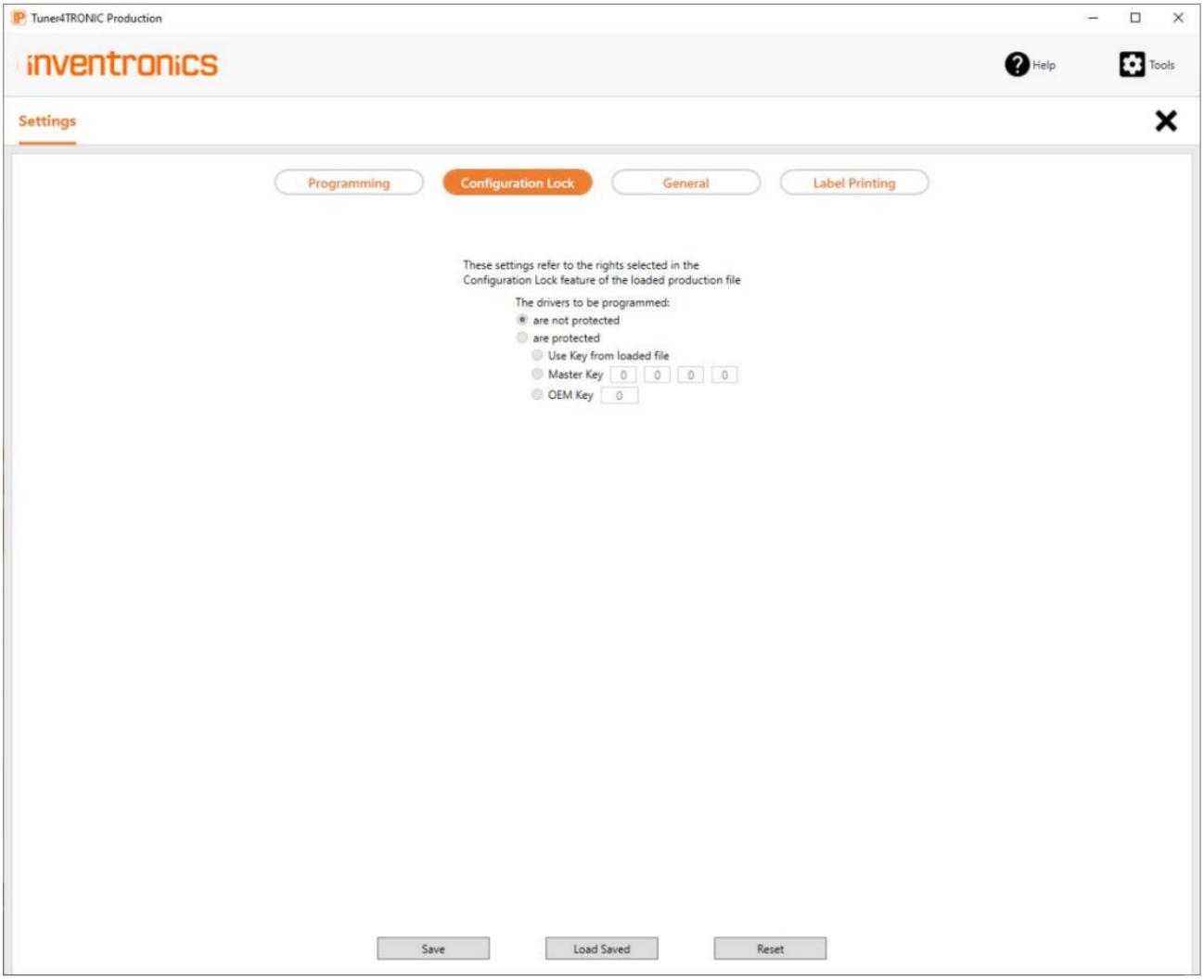
> **Warning:** Before disabling the NFC power-on check, ensure that the driver is not powered. The software will not perform this check. Do not disable it by default.

List multiple programming events

By default, programming the same driver, identified by its serial number, twice overwrites its previous event without increasing the counter. Enable **List multiple programming events** to count every programming operation and retain all events with separate timestamps.

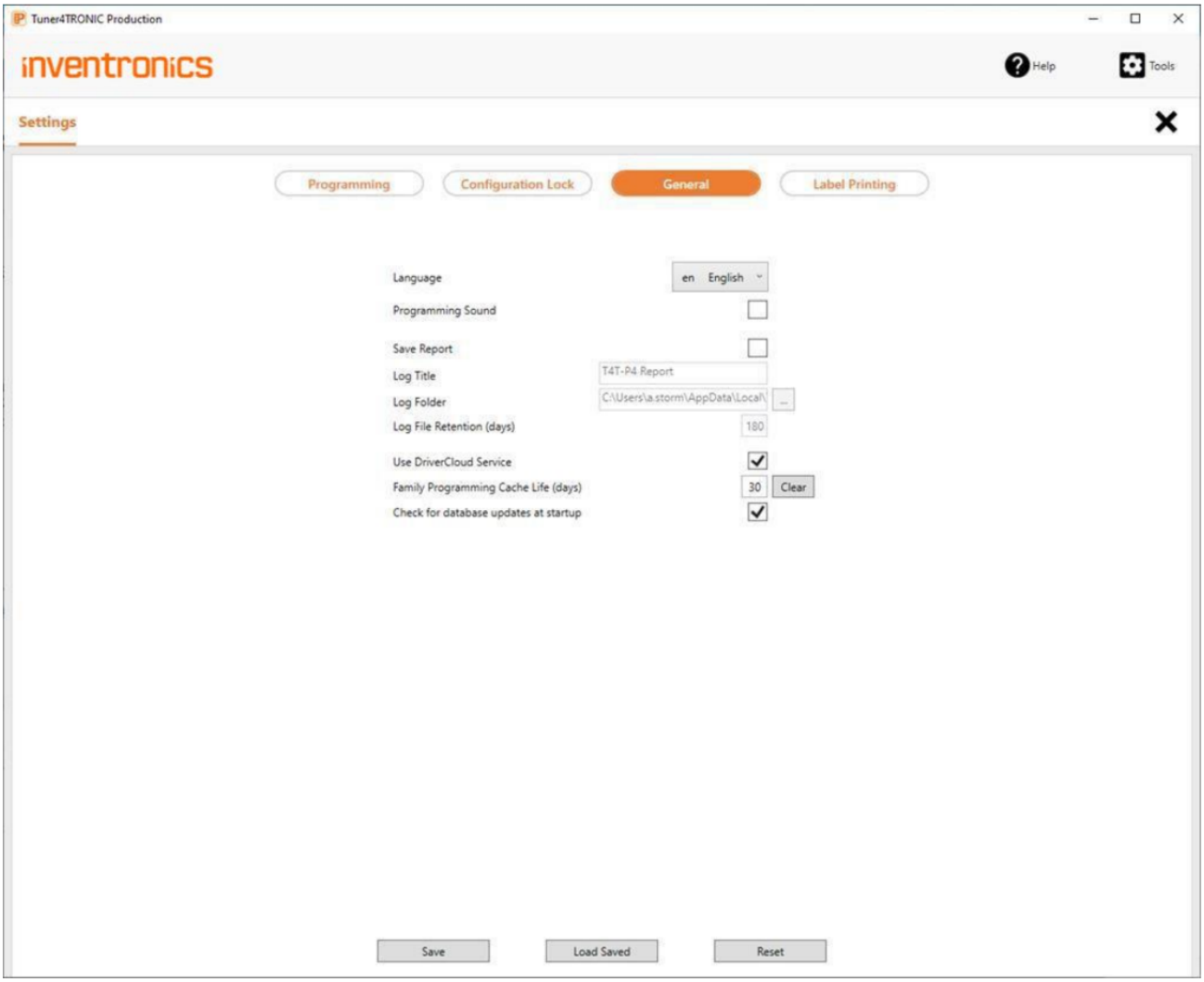
2.9 Settings - Configuration Lock

Open **Tools > Settings > Configuration Lock** to override password settings from the Production File and allow programming of protected drivers. Use **Master Key** for drivers with two-level password protection, or **OEM key** for single-level password protection.



2.10 Settings - General

Open **Tools > Settings > General** to edit general parameters.



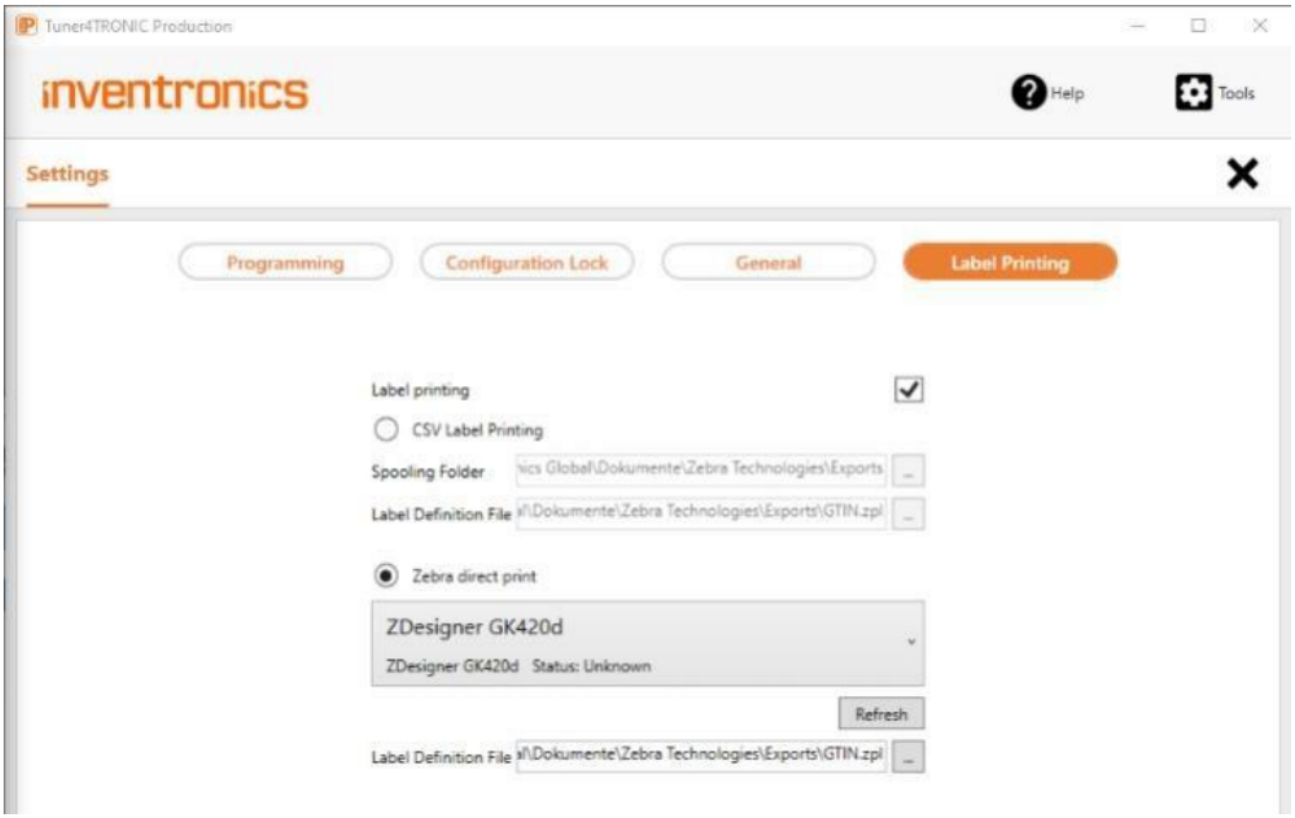
Setting	Function
Programming sound	Play a sound after each programming operation.
Logging	Create HTML programming logs using the configured title and folder.
Log Files Retention (days)	Delete expired logs to free local storage.
Cloud Service	Enable family programming, automatic offline family database updates, T4T update notifications, clear-text reports and the driver registry.
Family programming cache	Delete cached family programming files after the retention period to free storage.
Check for database updates at startup	Check for database updates whenever T4T-P starts.

2.11 Settings - Label Printing

T4T Production can automatically trigger label printing after each driver is programmed. Labels can include luminaire information, barcodes or QR codes for later identification. Two methods are supported: CSV label printing and Zebra direct printing.

CSV label printing

T4T Production exports the data; third-party software designs and prints the labels. Use an automation-capable edition of label software such as NiceLabel or BarTender to create the template, including barcodes or QR codes, and trigger printing. Label definition templates use `.nlbl` files.



1. Open **Tools > Settings > Label Printing** and enable label printing.
2. Select **CSV Label Printing** and browse for the label definition file and spooling folder.
3. Configure the third-party application to monitor the spooling folder and combine new driver data with the label template.

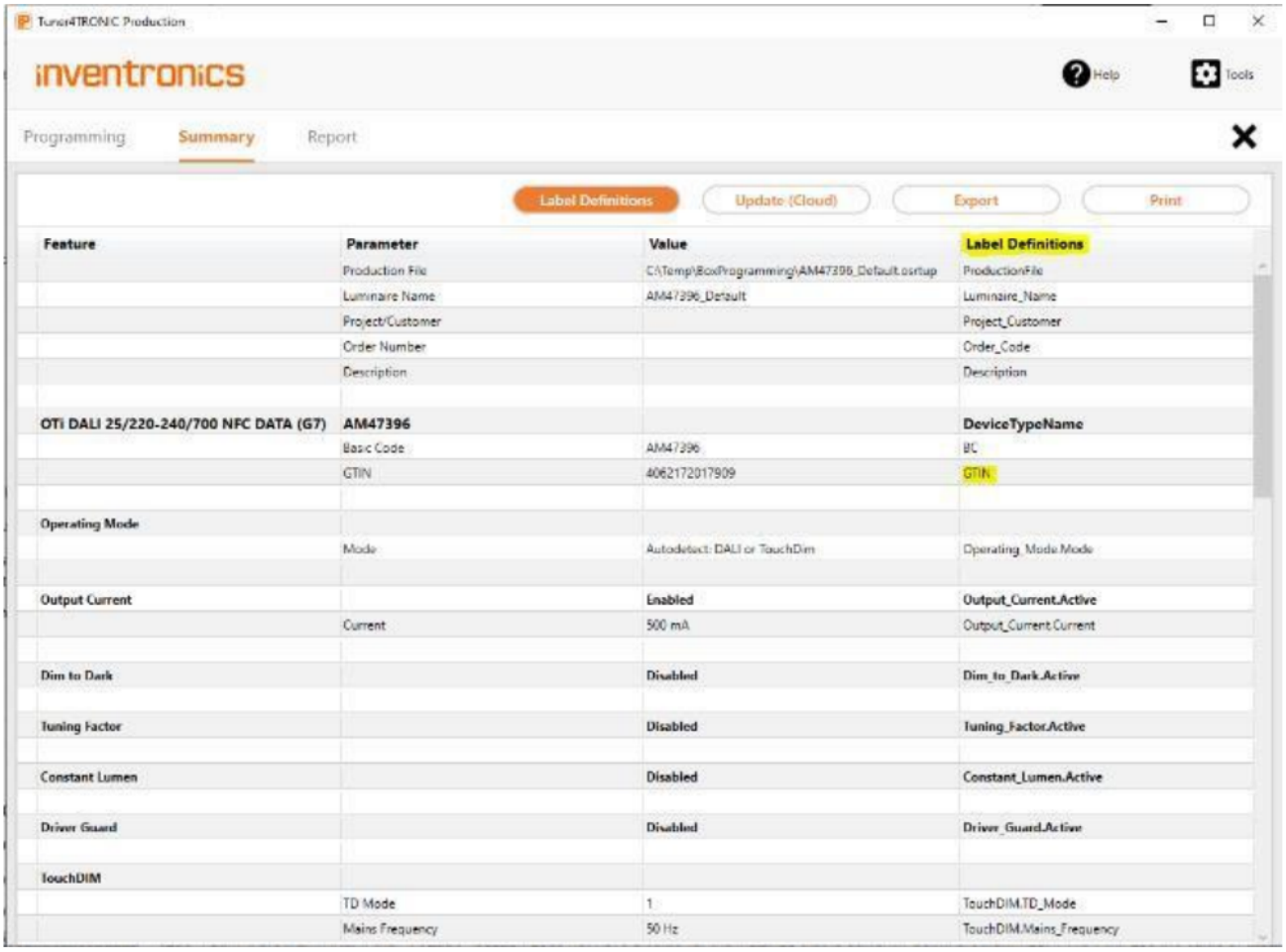
After each successful driver programming, T4T creates `Output.csv` in the spooling folder. It contains the parameters written into the driver, such as operating current, dimming, luminaire name and information, individual serial number and GTIN.

`Output.csv` contains only the latest driver's data and is overwritten after each programming operation. The monitoring label application triggers printing automatically when the file is created. With box programming, one label is created per driver, for example 20 labels for a box of 20 drivers.

Zebra direct print

T4T can inject data into ZPL templates and send labels directly to Zebra printers without third-party printing software. Create a ZPL template with a design tool such as ZebraDesigner 3.

To insert driver or project data, enclose the property name in curly brackets, for example `{GTIN}`. Available properties appear in the **Label Definition** section.



Feature	Parameter	Value	Label Definitions
	Production File	C:\Temp\BoxProgramming\AM47396_Default.osrtup	ProductionFile
	Luminaire Name	AM47396_Default	Luminaire_Name
	Project/Customer		Project_Customer
	Order Number		Order_Code
	Description		Description
OTi DALI 25/220-240/700 NFC DATA (G7)	AM47396		DeviceTypeName
	Basic Code	AM47396	BC
	GTIN	4062172017909	GTIN
Operating Mode			
	Mode	Autodetect: DALI or TouchDim	Operating_Mode.Mode
Output Current		Enabled	Output_Current.Active
	Current	500 mA	Output_Current.Current
Dim to Dark		Disabled	Dim_to_Dark.Active
Tuning Factor		Disabled	Tuning_Factor.Active
Constant Lumen		Disabled	Constant_Lumen.Active
Driver Guard		Disabled	Driver_Guard.Active
TouchDIM			
	TD Mode	1	TouchDIM.TD_Mode
	Mains Frequency	50 Hz	TouchDIM.Mains_Frequency

Sample ZPL file:

```
^XA
^BY5,2,170
^FO100,50^BC^FD{GTIN}^FS
^XZ
```



Appendix - Monitoring Data v2

The following tables preserve the parameter groups and descriptions from the source manual. **An asterisk (*) means the parameter can only be read through DALI.** Reading monitoring data through NFC does not provide every parameter, such as power.

Energy

Group	Parameter	Description
Active Energy & Power	Active Energy	Integral of instantaneous power over time, in watt-hours.
Active Energy & Power	Power*	Under periodic conditions, mean instantaneous power over one period, in watts.
Apparent Energy & Power	Apparent Energy	Integral of apparent power over time, in volt-ampere-hours.
Apparent Energy & Power	Apparent Power*	Product of RMS terminal voltage and RMS current.
Load Side Energy & Power	Active Energy Loadside	Integral of load-side power over time, in watt-hours.
Load Side Energy & Power	Active Power Loadside*	Input power minus DALI bus supply power and auxiliary supply power, where present. Supply losses may be neglected in the measurement.

Driver diagnostics and maintenance

Parameter	Description
Operating Time	Control gear powered operating time in seconds, regardless of the lampOn bit.
Start Counter	Number of control gear starts caused by external supply power cycles. A power cycle is counted when power-on time is at least 600 ms.
External Supply Voltage*	RMS external supply voltage.
External Supply Voltage Frequency*	External supply frequency. A value of 0 indicates pure DC or rectified AC; examples: 17 for 16.7 Hz and 50 for 50 Hz.
Power Factor*	A ControlGearPowerFactor value of 100 means a power factor of 1.00.
Overall Failure Condition*	Indicates whether the LED driver has experienced a failure.
OverallFailureConditionCounter	Number of overall failure conditions.
External Supply Undervoltage*	Indicates supply voltage below the specified input range.
ExternalSupplyUndervoltageCounter	Number of external supply undervoltage events.

Parameter	Description
External Supply Overvoltage*	Indicates supply voltage above the specified input range.
ExternalSupplyOvervoltageCounter	Number of external supply overvoltage events.
Output Power Limitation*	Indicates driver output power above the output power limit.
OutputPowerLimitationCounter	Number of output power limitation events.
Thermal Derating*	Indicates output current reduction because driver temperature reached a level that could affect lifetime or performance.
ThermalDeratingCounter	Number of thermal derating events.
Thermal Shutdown*	Indicates output current reduced to zero because driver temperature exceeded the thermal shutdown threshold, above the derating threshold.
ThermalShutdownCounter	Number of thermal shutdowns.
Temperature (internal)*	Internal control gear temperature encoding: a value of 60 means 0 °C; 0 means -60 °C.
Output Current Percent*	Driver output current as a percentage of nominal current, including internal reductions except those due to constant lumen functionality.

Lamp diagnostics and maintenance

Parameter	Description
StartCounterResettable	Resettable count of light-source starts.
Start Counter (Total)	Total light-source starts.
On Time Resettable (CLO)	Light-source operating time in seconds. The CLO profile follows this value; it can be reset or edited to any value.
On Time (Total)	Total light-source operating time in seconds.
Output Voltage*	Actual driver output voltage.
Output Current*	Actual driver output current.
Overall Failure Condition ("Lamp failure")	Indicates whether the luminaire has experienced a failure.
Overall Failure Condition Counter	Number of lamp failures.
Short Circuit	Indicates a lamp failure with a short circuit.

Parameter	Description
Short Circuit Counter	Number of lamp short circuits.
Open Circuit	Indicates a lamp failure with an open circuit.
Open Circuit Counter	Number of lamp open circuits.
Thermal Derating	Indicates output current reduction because lamp temperature reached a level that could affect lifetime or performance.
Thermal Derating Counter	Number of lamp thermal derating events.
Thermal Shutdown*	Indicates output current reduced to zero because lamp temperature exceeded the thermal shutdown threshold, above the derating threshold.
Thermal Shutdown Counter	Number of lamp thermal shutdowns.
Temperature*	Light-source temperature encoding: 60 means 0 °C; 0 means -60 °C. Measured by an external sensor thermally coupled to the light source; the sensor interface and configuration are manufacturer-specific.

Service contact

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