



### **Firmware v3.9 Features:** (released 11/20/18)

**Bug fix** – Fixed nuisance faulting when compensating for large and rapid pressure changes.

**ON Signal Delay** – DAT will wait to turn unit on if there has been less than 5 seconds between OFF and ON signal. ON will not occur if signal is not constant.

**Added LED Pattern** – Added LOW\_PWR LED to LOAD\_FAULT light pattern.

### **Firmware v3.8 Features:** (released 4/28/18)

**Flash During Power Line Crash** – In the past, when AC crashed the data would be prevented from flashing unless in the stand-by state. Now the flash will occur in both the running and stand-by states. Also, prevents flashing corrupted data during the crash.

*NOTE: Running state is when inverter output is ON. The stand-by state is when AC input is ON but, the inverter output is OFF.*

### **Firmware v3.7 Features:** (released 7/29/17)

**Added Forced Standby Enunciation** – terminal strip #7 (Inv ON) output can either be ON continuously or flash like 'Inv ON' circuit board LED during a Forced Standby condition

(Factory1 Tab of PlasmaVIEW). When Inverter ON command is present the following conditions cause a 'Forced Standby':

1. 0 PDM command if **Dip switch #8** (4/20ma) is ON
2. 0 PDM command with '**Precision PDM**' enabled (Factory1 Tab of PlasmaVIEW)
3. **Inverter ON Delay Timer** is actively counting down (Numeric Table Tab of PlasmaVIEW)

Also revised IGBT fault limits to accommodate new alternate devices.

### **Firmware v3.6 Features:** (released 3/29/17)

**Programmable Fan Max Speed Limit – DC** fans can now be limited to a maximum speed (applied voltage) via PlasmaVIEW 2.6.11 or greater. The programmed value is retained in the 'Setup' file. Limit is also in affect if the 'Cont Fan' jumper (J4) is removed. Bug fixes for new fault array.

### **Firmware v3.5 Features:** (released 12/15/16)

**'Keep Cool' fan control** – fans are automatically managed in the **standby mode** and turned on for about 90 seconds every 6 -16 minutes to cool down the idling power supplies for maximum life. The default is active but the feature can be disabled in PlasmaVIEW 2.6 and up, if desired.

**Operational Time Clocks:** Track total time with **AC mains** are applied, total time inverter is engaged '**ON**' and total time since last factory **maintenance** reset – all in Minutes (limit – 16,777,216 minutes, ~32yrs). Displayed in PlasmaVIEW v2.6 and up and available for PLC download.

**Simplified processor FLASH** can be performed in full **AutoTune** mode thereby eliminating the need for field measurements and adjustments. Uses **factory calibrated power level** but updates processor with field installations line voltage, pressure, flow, frequency, etc. Algorithm improvements now enable 'flashing' at PDM levels as low as 50%.

**More tolerant adjusting** environment with customer supplied loads – Almost all fault responding is disabled when the AutoTune jumper is removed thereby minimizing nuisance setup trips.

A complete header information dump can now be accomplished via terminal program using the single letter " i " .

### **Firmware v3.4 Features:** (released 11/7/16)

**Precision PDM** for systems operating at low PDM percentages in the **5 to 10% range**. This selectable alternate programmable method operates normally from 100% to 16% but produces 1 second precision output bursts when PDM is less than 16%, which provide .5% control. Additionally, a PDM command of 0 produces no ozone (as opposed to 1 or 2% with the standard method).

**Stored Fault History.** Enhanced and simplified **unique** Status and Fault code bits for simple PLC or PlasmaVIEW lookup. In addition, if a fault/s occur, they are permanently stored in memory and available for interrogation at the next power up cycle.



### **Firmware v3.3 Features:** (released 9/1/16)

After the 'AutoTune' jumper is pulled; inhibits faults for 30 seconds beyond the last observed adjusting of the voltage pot (4 min max).

More tolerant of adjusting a system that is far from a default set point.

Flash is not executed if PDM is less than 95% >> notice given by strumming LED's up the string 4 times.

Enables the use of dual low voltage supplies used with 4 high capacity DC fans.

Disables Data Flash when mains crash if inverter is ON (driving a load) >> reduces likelihood of corrupted data.

Misc. housekeeping array updates for new products.

**Known Issues:** Locked light flash in standby if a load fault occurred momentarily during start up, no hard fault displayed >> reminder that cell probably needs re-flashing or service. Sufficiently confusing to warrant removal.

### **Firmware v3.2 Features:** (released 2/11/15)

**(NOTE ! Existing set up files must be updated before they can be used with v 3.3)**

A setup file utility can be downloaded from the PTI website to upgrade setup files for use with version 3.3. PTI will also upgrade and return any \*.txt setup files emailed to them. All DAT210 boards can be upgraded to v 3.2, contact PTI for information.

Dip Switch #7, previously unassigned, enables 'Drop Back Mode' if ON. Products with multiple transformers can now detect the loss of one or more cells/transformers and continue to run at a reduced power level consistent with the number of cells still functional. Notification is delivered via 'Load Fault' LED and terminal #4 going low. A general fault is inhibited. All other fault detection and actions remain unchanged. This mode enables continued ozone production at reduced levels but will likely result in more internal cell damage and expensive repair. If Dip Switch is OFF a fault per above results in a normal shutdown, 'General Fault' is enunciated as well as 'Load Fault' LED via terminal #4 going low. A unique LED flash sequence and digital code via RS232 interface is also provided.

Start-up ramp times have been further reduced if Dip Switch #6 is ON, 'PDM Ramp Control' is disabled. The PDM ramp is essentially 0 and voltage ramp is reduced resulting in a nearly instant ON. Not recommended for normal ozone cell loads. Helpful for **Plasma Torches**.

**Unique status code** representing running and fault status is available via RS232.

Processor stores the most recent status and **fault codes** for **archive** retrieval via RS232 which is available even if unit has been power cycled.

Automatic power management of **non-resonant loads** has been added. New selectable Constant Power mode wherein power is dynamically managed by Voltage control only. In this mode, Frequency is manually adjusted to a desired value via on board pot or 0-10v (also 4/20ma current) input #15. Selectable via firmware command (Default = OFF).

Full-Auto no longer uses Voltage pot as a **starting reference** default. Digital value from Flashed Table is used. Will reduce field nuisance faults due to tinkering with Voltage pot. Can be disabled in firmware so as to be the same as all previous versions.

'Inv ON' **output #7** can be selected to be on **steady or flash** with PCB LED when PDM is less than 4ma. Eliminates PLC 'Inv ON' status confusion. Selectable via firmware command. (Default #7 non-flash).

Programmable delay '**Inv ON**' **timer mode** added. Runs each time ON occurs; also functions with power-up if "PWR UP ON" jumper is installed. Approximately 1 second delay per count. 0 to 256 seconds (4.26 minutes) via Hex 00-FF (Default = 0) adjustable in PlasmaVIEW v 2.6 or from memory M139.

'Load Fault' at terminal #4 is inhibited if the DAT210 is the programmed '**Master**' of a multi-unit system. LED's enunciate normally.

Firmware auto line voltage select disabled. Uses only programmed line voltage selection. This prevents a 240v unit from re-selecting a 120v range should a severe brown out occur. Affects calculations only.

Automatic internally generated ON delay immediately following an OFF command guarantees uniform restart conditions. For condition: ON/OFF/ON, the re-enabling ON will be delayed by 3 seconds from the time an OFF command is received.

General product parameter limits and start-up table updates.

Misc. bug fixes.