Paladin V693 – Basic Options on DIP-6

DIP Switch Number	OFF	ON
1	Normal	Battery / Hybrid Fitted
2	Normal	Max 5400W Grid In ***
3	Normal	Second SSR Fitted
4	Normal (Max 73C)	Max Temp 78C *
5	Normal (Min 40C)	Minimum Temp Bit 0 *
6	Normal (Min 40C)	Minimum Temp Bit 1 *

** Switches 5 & 6 Are set as follows (OFF/OFF = Default)

Switch 5	Switch 6	Min Temp
OFF	OFF	40C
ON	OFF	30C
OFF	ON	20C
ON	ON	10C

** Boost Switch Operation

([^ or +] replace degree symbol after temperature to show switch selection)

Left [+]	Centre	Right [^]
62C Overnight Boost	Normal	50C Over-ride (Now)

Top Line Information

WORD	MEANS
PALADIN	Nothing Happening
THROTTLE GRAPHIC	Proportional to Heater Use
SENSOR (on left)	No Temperature Reading
NO TEMP	Temperature Probe Not Fitted / Detected
ELEMENT	Heater Not Responding **
MAXIMUM	Paladin has reached Max Temperature
TO GRID	Excess PV is being sent to Grid
TOP UP	Normal Top Up to Min Temperature
HEALTH	Health Top Up to 60C

** This is usually a tank thermostat tripping during HEALTH top up.

*** When an ESP32 LoRa is fitted this switch forces use of remote temperature.

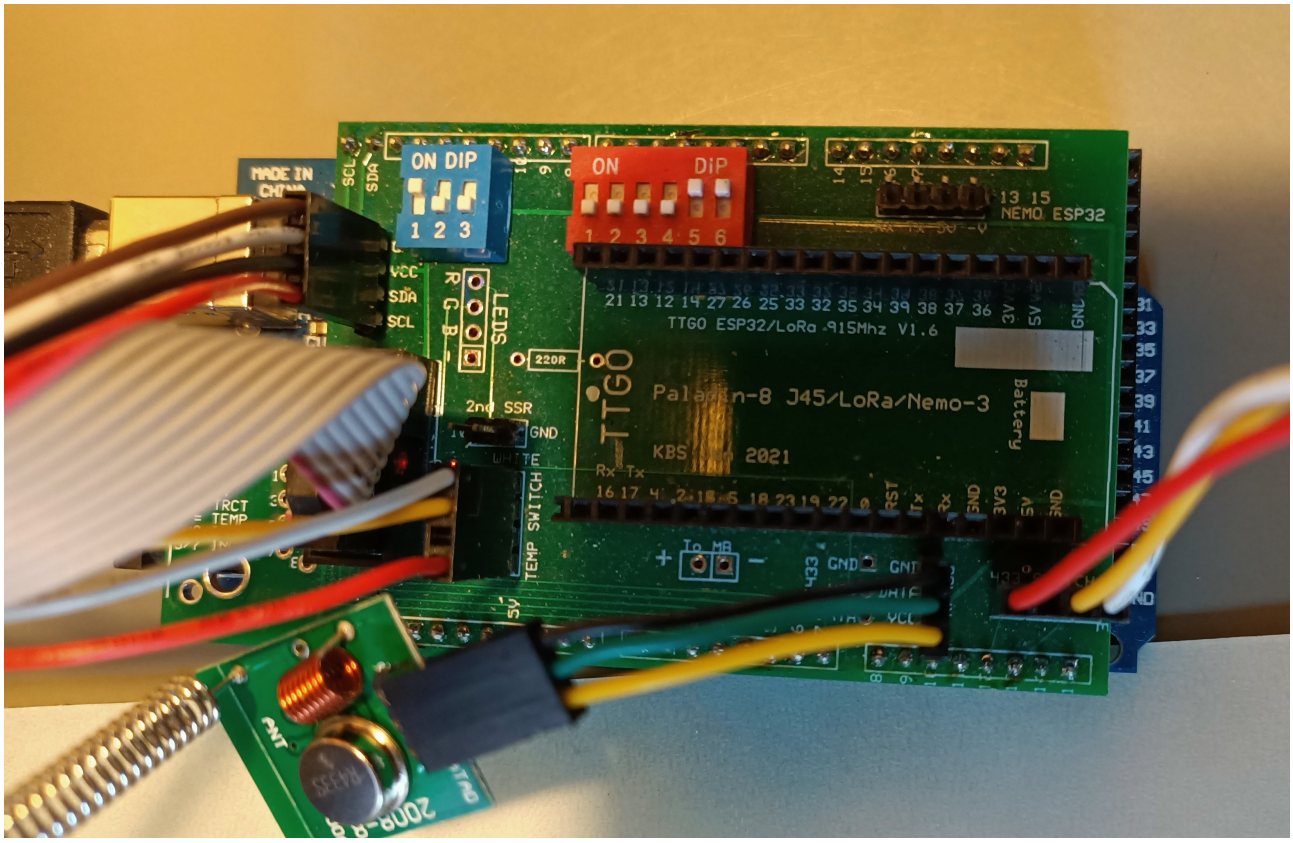
3 Pin DIP switches should all be OFF. (These are for the RF433 option – see below)

Paladin V693 – Advanced Options on DIP-3

Use of the RF433 option now requires a revised daughterboard (Jan 2021) and a second selector switch, usually mounted at the bottom of the case.

DIP Switch Number	OFF	ON
1	RF433 Inactive	RF433 Active at 1000W
2	Normal	Add 500W to Active Value
3	Normal	Add 1000W to Active Value *

Switches 2 & 3 allow variations in Active (Turn On) excess solar between 1000W and 2500W as required. This is only read at start-up, so changes made with the unit running will not be registered.



In the photo above note the connections and orientation of the RF433 module and the switch assembly.

The switch connection must have the WHITE lead to the outside of the board. The RF433 GND (Ground) pin from the board must connect to the GND pin on the module. Ditto the DATA and VCC.

Mount the switch in a suitable hole on the bottom left of the case (away from the mains power). The RF433 module can be left floating on it's short cable inside of the case. If greater range is required. Move the RF433 module outside the case using a longer lead, and mount with the antenna vertical. (Note – the antenna is a tuned length – do not cut or extend)

RF433 Operation and Logic

The RF433 control is via the 3 way switch. RIGHT is towards the RED wire. LEFT is towards the YELLOW wire. CENTER is OFF. All RF433 operations are on an 8 second cycle and display changes are not always instantaneous.

In the OFF position the RF433 is deactivated and the Paladin display is normal. A single OFF signal is sent to the remote socket for synchronization.

In the LEFT position the RF433 will go into a continuos TEST sequence and trigger the remote switch as follows: 2 Seconds ON / 2 Seconds OFF x 2 then a 8 Second pause. This is to test range and remote switch actions. The Paladin display will show RF TEST in the top centre to remind you to switch back to OFF. The Paladin will operate normally, but prolonged testing will eventually burn out the remote switch relay.

The RIGHT switch position ARMS and Activates the RF433 logic. The display line 3 will indicate the ARM / RUN status and the 3 minute rolling average of excess PV/Transfer available on the right hand side. (Replacing the Transfer Totals). The Rolling Average value is zeroed when the switch is moved to ARM (RIGHT).

The A/I (Ant Intelligence) monitors the excess PV and Transfer values to calculate an excess PV available for the RF433 as follows :

Water less than 50C : Counts Export only.

Water between 50C and 60C : Counts Export and 10% of Transfer for each degree C above 50C, so that :

Water above 60C : Counts 100% of Transfer and all Export.

Once the Average Value reaches the Active Value determined by the DIP-3 setting, the RF433 will turn ON and stay ON until the Average drops below 200W. The 3 minute averaging prevents switch cycling for short duration dips in PV output or increased house load. Paladin will Transfer any excess as normal throughout.

If the average drops below the cut-off value of 200W the system will turn off the remote socket and then restart the average count and the ARM sequence as above. Thus leaving the switch in ARM throughout the day will ensure that the remote socket is ON whenever excess PV conditions permit. There is a small buffer built into the logic to prevent excess draw from the grid when the RF433 is active. Setting an Active Value greater than the switched load will effectively add to this buffer and ensure little or no grid draw at the cost of delayed startup. The reverse is also true.

The RF433 logic retransmits it's current ON/OFF status every 8 seconds to maintain synchronisation should the remote be used to over-ride Paladin's A/I or in the event of a power loss to the remote circuit. If you want to use the remote, the RF433 Switch must be returned to OFF.