Winnebago Micro Minnie FLX Electrical System
Part2

FLX Electrical System Component Functions & Configuration Settings

Xantrex Inverter/Charger Configuration Parameters

WTOW provided Xantrex Inverter/Charger Configuration

Note: “default” is the Xantrex Inverter/Charger default setting, not the recommended FLX setting in many cases.
<Warning> Performing a Xantrex default reset will require manually reconfiguration to the WGO Factory Setting.

Setting Number	Setting Name	WGO Factory Setting	Default
01	Inverter Ignition Control	OFF	OFF
02	LBCO Voltage	12.1	10.5
03	LBCO Shutdown Delay Timer	300	300
04	LBCO Recovery Voltage	13.8	13.1
05	Power Save Time	0	25
06	Power Save Mode	DIS	DIS
07	Output Frequency	60	60
08	Output Voltage	120	120
09	Inverter Output Power Limit	3000	3.0
10	Inverter Output Power Limit Timer	300	300
11	Transfer Mode	APL	APL
12	Utility AC Under Voltage Level	90	90
13	Inverter Shutdown Recovery	ON	MAT
14	Audible Alarm	ON	ON
20	Battery Type	LFP	FLD
21	Battery Temperature	WARM	HOT
22	Custom Absorption Voltage	14.6	14.6
23	Custom Float Voltage	13.6	13.5
24	Charger Current	150	150
26	Charger Ignition Control	OFF	OFF
27	Equalize Charging for Flooded Battery	DIS	DIS
28	AC Input Breaker for Load Share	30	50
99	Reset all settings to their default values	NDF	NDF

Chart is From WTOW via Winnie board

Tunable Parameters

Items 24 and 28 should be considered “tuneable” in adjusting the system for off nominal conditions, notably prevent less than 30 amp shore power service from tripping(28), and lowering charge current has been suggested as useful when the Xantrex is working hard to feed AC loads and charge the battery.

GoPower! 30 Amp MPPT Solar Charger Theory of Operations

Basic Operations Overview

The GoPower! 30 Amp MPPT Solar Charger, charges the Lithionics battery by executing a sequential 3 stage charging flow consisting of; Bulk, Absorption and Float stages. The charts below, from the, GoPower! 30 Amp MPPT Solar Charger manual, illustrate and elaborate on this flow.

Note that because Equalization is not relevant for Lithium batteries the stages in the chart do not align perfectly with the stages of charging.

Additionally it is helpful to understand the conditions that ‘trigger’ the change from one charge to the next, because these are key parameters of the configuration table.

Charging Stage Triggers

Each step of the flow has a “trigger” that initiates the transition to the next step.

Bulk Charging is triggered when the battery voltage falls below the Recharge Voltage set-point.
The Recharge Voltage set-point is a configurable voltage value in the GoPower! 30 Amp MPPT Solar Charger configuration table.

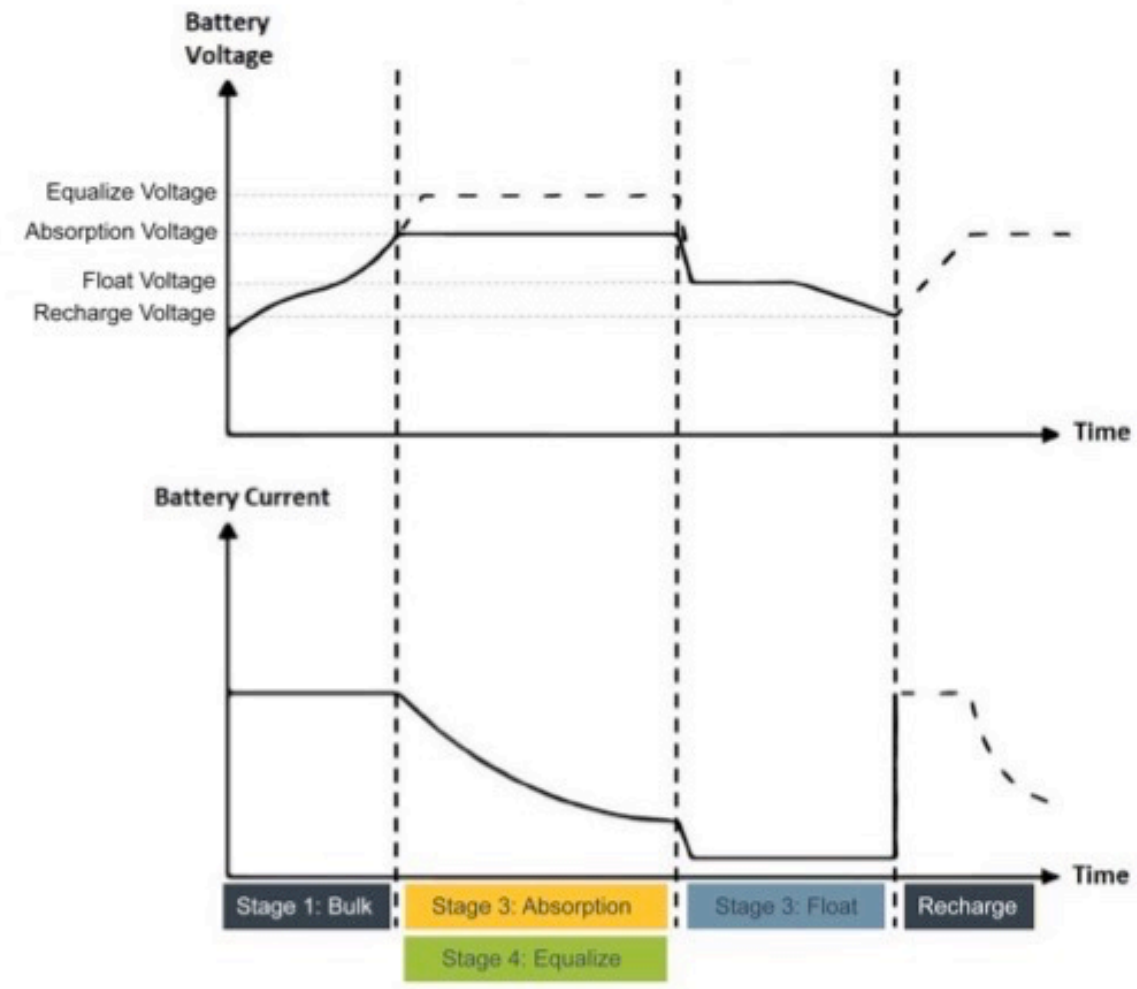
Absorption Charging is triggered when the battery voltage reaches the Absorption charging set-point. The Absorption Charging set-point is a configurable voltage value in the GoPower! 30 Amp MPPT Solar Charger configuration table.

Float Charging is triggered upon “time out” of the Absorption period. Absorption Duration is a configurable time value in the GoPower! 30 Amp MPPT Solar Charger configuration table. Float charging continues until the battery voltages drops to the Recharge Voltage set-point triggering the next 3 stage sequence by initiating Bulk charging.

The following information was taken from the GoPower! Manual and elaborates the 3 step charging flow.

5. CHARGING STAGES

Maximum power point tracking is used to charge the batteries with the highest current possible, but this is only part of the equation. A battery cannot be charged at maximum power all the time for safety reasons, so multiple stages are used.
These stages include: bulk, absorption, float and, for some types of batteries, equalization as indicated below.



STAGE 1: BULK

In quick charge stage, the battery voltage has not yet reached the set value of full charge voltage (i.e. equalizing/boost charge voltage) and the controller will perform MPPT charging, which will provide maximum solar energy to charge the battery. When the battery voltage reaches the pre-set value, Stage 2 charge will start.

STAGE 2: ABSORPTION

When the battery voltage reaches the absorption voltage, the controller will perform constant voltage charging. This is no longer MPPT charging, and the charging current will gradually decrease with time.

STAGE 3: FLOAT

Float charge is conducted following the absorption charge stage. The controller will reduce the charge current to a small amount in order to

reduce sulfates on the battery plates or to allow a lithium battery to balance it's cells. If the load exceeds this small current the battery voltage will start to decrease until it reaches the recharge voltage. When the battery voltage falls below the recharge voltage, the controller will switch back to bulk charging.

Additional notes
Solar Charging Idle Stage
During darkness the solar charging system is in an idle state. No power is produced by the solar panels and no power is output to the battery from the Solar charger.

Shore Power Charging
Battery charging may take place during solar charging Idle stage via "shore power" through the Xantrex system converting AC "shore power" to DC and providing that DC power to the battery. This may also occur in conjunction with any Solar Charging Stage.
Note: The xantrex Inverter/charger must be powered on for "shore power" charging to occur.

GoPower! 30 Amp MPPT Solar Charger Configuration for Micro Minnie FLX *

<Subject to change> WTOW has not provided recommended settings for the FLX system.
The table below was coordinated with GoPower! technicians who were knowledgable of the FLX system and worked in conjunction with Lithionics to develop the FLX system.

Note: GoPower! Solar Charger default setting are NOT the recommended FLX setting in many cases.
<Warning> Performing a GoPower! Solar Charger default reset will require manually reconfiguration to settings appropriate to the FLX system.

Parameter	Value	Rationale
Battery Type	**Lithium**	Required for OEM battery

Capacity	**320 Ah**	Required for OEM battery
System Voltage	**12 V**	Required for OEM battery
Charge Current Limit	**30 A**	Max Value of GoPower! Charger
High Voltage Disconnect	**16 V**	*GoPower! Recommendation Protects Charger from Battery voltage spike*
Equalize Voltage	**14.4 V**	*Not applicable for Lithium battery.*
Equalize duration	0	*Not applicable for Lithium battery.*
Equalize Interval	0	*Not applicable for Lithium battery.*
Bulk-Absorption voltage	**14.4 V**	Confirmed by GP as Lithionics Recommendation
Absorption duration	**120**	*GoPower! Recommendation (tunable)*
Float Voltage	**13.8 V**	*GoPower! Recommendation*
Recharging Voltage	**13.2 V**	*GoPower! Recommendation set this less than the float voltage. Somewhere around 13.2-13.4V*
Under Voltage Warning	**12 V**	*GoPower! Default*
Discharge Limit Voltage	**11 V**	*GoPower! Default*
Over-discharge Delay Time	**10 S**	*GoPower! Default*

Over-discharge return (V)	**12.8 V**	*GoPower! Default*
Temp Compensation Factor	**0**	*Not applicable for Lithium battery.*

* GoPower charger (**GP-RVC-MPPT-30)** values appropriate for interfacing with the FLX system Lithionics 12V 320AH E2107 GTX UL Battery OEM Model with internal BMS