Enedo▶

ADC7480 SERIES

3000W Battery Chargers and Power Supplies

• Wide output adjustment range 0...108VDC • Analog control by external 0-5VDC voltage

• Temperature compensation charging, sense as on option • Power fail relay alarm

• Master-Servant connection

CE

ADC7480 SERIES
Datasheet

PRODUCT DESCRIPTION
Analog control 0-5V, isolated
Power fail relay alarm
Analog control + relay alarm
Servant unit (RS-232 bus IN/OUT)
Servant unit + relay alarm (RS-232 bus IN)
Temperature compensated battery charging
Temperature compensated battery charging + relay alarm

APPLICATIONS
• Industrial battery chargers and power supplies
• Various industrial DC supplies
• Electric Vehicles
• Auxiliary DC supply for Telecom and Infrastructure
• Industrial machines (forklift charging, aux power in machines)

FEATURES
• 3200W output power range modules
• Parallel and series connectable
• Master-Servant connection
• Wide input voltage range:
  70 – 264 VAC
  80 – 108 VDC
• 12, 24, 36, 48 and 72 standard output variants
• Settable DC output voltage from 0 – 108VDC
• Settable output current
• Over 100 different model variations
• Optional analog control by external 0-5VDC
• Optional temperature compensation and charging algorithms
• Optional power fail relay alarm
• Easy custom modification
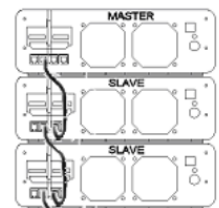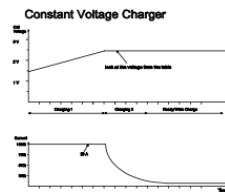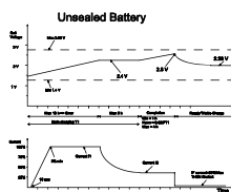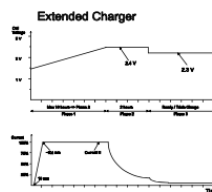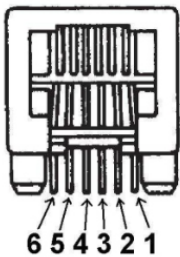
Analog control modular connector

Microprocessor controlled charging curves for all kind of batteries

Master-Slave connection

POWER SUPPLIES AND BATTERY CHARGERS, TRIMMER ADJUSTABLE							
Type	Input Voltage Range **)	Nominal output voltage	Voltage setting range	Nominal output current	Current setting range	Max power	Installation / dimensions (Width x Height x Depth, mm)
ADC7480/12	70-264VAC/80-369VDC	12 VDC	0-18 VDC	200 A	0-200 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/24	70-264VAC/80-369VDC	24 VDC	0-36 VDC	127 A	0-127 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/36	70-264VAC/80-369VDC	36 VDC	0-54 VDC	95 A	0-95 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/48	70-264VAC/80-369VDC	48 VDC	0-72 VDC	64 A	0-64 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/72	70-264VAC/80-369VDC	72 VDC	0-108 VDC	42 A	0-42 A	3200 W	Wall/Bench 400x250x80 mm

ANALOG CONTROLLABLE MODELS BY EXTERNAL 0-5VDC VOLTAGE

Type	Input Voltage Range **)	Nominal output voltage	Voltage setting range	Nominal output current	Current setting range	Max power	Installation / dimensions (Width x Height x Depth, mm)
ADC7480/12AI	70-264VAC/80-369VDC	12 VDC	0-18 VDC	200 A	0-200 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/24AI	70-264VAC/80-369VDC	24 VDC	0-36 VDC	127 A	0-127 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/36AI	70-264VAC/80-369VDC	36 VDC	0-54 VDC	95 A	0-95 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/48AI	70-264VAC/80-369VDC	48 VDC	0-72 VDC	64 A	0-64 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/72AI	70-264VAC/80-369VDC	72 VDC	0-108 VDC	42 A	0-42 A	3200 W	Wall/Bench 400x250x80 mm

BATTERY CHARGERS WITH TEMPERATURE COMPENSATIONS

Type	Input Voltage Range **)	Output voltage factory setting	Programmed output voltages	Output current (see table)	Max power	Installation / dimensions (Width x Height x Depth, mm)
ADC7480/12T	70-264VAC/80-369VDC	13.7 VDC	3.3-18 VDC	200 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/24T	70-264VAC/80-369VDC	27.4 VDC	12-28 VDC	127 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/36T	70-264VAC/80-369VDC	41.4 VDC	13.7-42 VDC	95 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/48T	70-264VAC/80-369VDC	54.8 VDC	13.7-60 VDC	64 A	3200 W	Wall/Bench 400x250x80 mm
ADC7480/72T	70-264VAC/80-369VDC	82.2 VDC	27,4-82,5 VDC	42 A	3200 W	Wall/Bench 400x250x80 mm

*) Cable sets with modular connectors are included in packing: 1.5m cable set for analog control and 2.5m for or temp. comp models
**) Reduced power80...230VAC/VDC, see curves at next page, max power 600W with DC input
If voltage version is more than 36V charger output is not SELV (Safety Extra Low Voltage) circuit.

MODELS WITH POWER FAIL RELAY ALARM (24V models as a type number example)

| Type	Option description	Cable set
ADC7480/24H	Trimmer adjustable model with power fail relay alarm	1.5 m, modular connector
ADC7480/24AIH	Analog controllable model with power fail relay alarm	Analog + relay cables
ADC7480/24TH	Temp.comp model with Power fail relay alarm	Temp.comp + relay cables

MASTER-SERVANT CONNECTION (24V models as a type number example)

Master units ***)	Servant units
ADC7480/24 or ADC7480/24AI (optional for ADC7520/24T) Control to servant via serial bus***	ADC7480/24S serial bus control in and out
	ADC7480/24SH servant unit with relay, serial bus in only
Cable set for master servant connection included in servant unit type number, 0.6m modular connectors in both ends	

***) Master unit or servant with serial bus output can not include the relay alarm
****) TTL level serial bus, need level converter if use with standard RS-232 port

CUSTOMISED VERSIONS S

• Cyclic battery chargers or customized charging curves for all kind of batteries
• Sense models
• Customized mechanics

Extended Charger

Unsealed Battery

Constant Voltage Charger
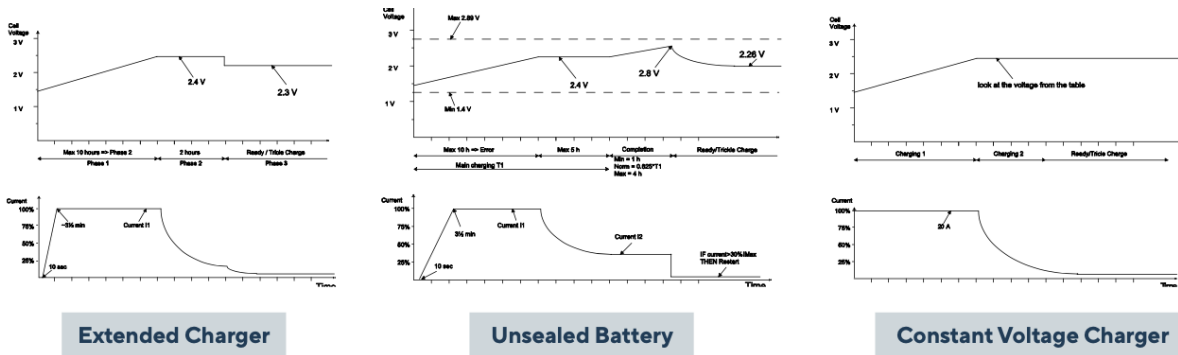
TECHNICAL DATA

|		
Input voltage		70...264 VAC (70...230VAC reduced power, see curve below)
		80...369 VDC (80...230VDC reduced power)
Efficiency		89% at full load, over 90% at 50% load (230VAC input)
Input current		16A (max)
Frequency		47-63 Hz
Power factor		>0.95
Inrush current		Soft start
Output ripple		<1% from output voltage, rms
Mechanics		Wal mounting, see dimensions fist page
Connectors	Input	Power cord, European schuko plug
	Output	Models 12V, 24V, 36V, 48Vcopper bus bar terminal
		Model 72V10 mm2 1.5m output cables
	Option	Options Modular connector
Enclosure		Aluminium case IP 20
Weight		7.1 kg without cables
Output grounding		Floating
Ambient temperature		-20°C...+45°C at full load, abs. max. +55°C, see curve below
Over temperature protection		Processor controlled on/off
Over current protection		Electrical current limit
Reverse polarity protection		With fuse
Isolations		Input - chassis 1500VAC
		Input - output 3750VAC
		Output - chassis 500VAC
EMC-Standard		EN 61000-6-1:2019
		EN 61000-6-3: 2006 +A1:2010
		EN 61000-3-2: 2018
		EN 61000-3-3: 2013 + A1:2017
EMC emissions		Commercial and light-industrial environment EN61000-6-3, EN55022 Class B
	EMC Immunity	Industrial environment EN61000-6-2
	Harmonics	EN61000-3-2
	Flickering	EN61000-3-3

Note: If charger's rated output voltage is higher than 36V it doesn't fulfill article 10.101 ("The no-load d.c. output voltage shall not exceed 42,4V.")
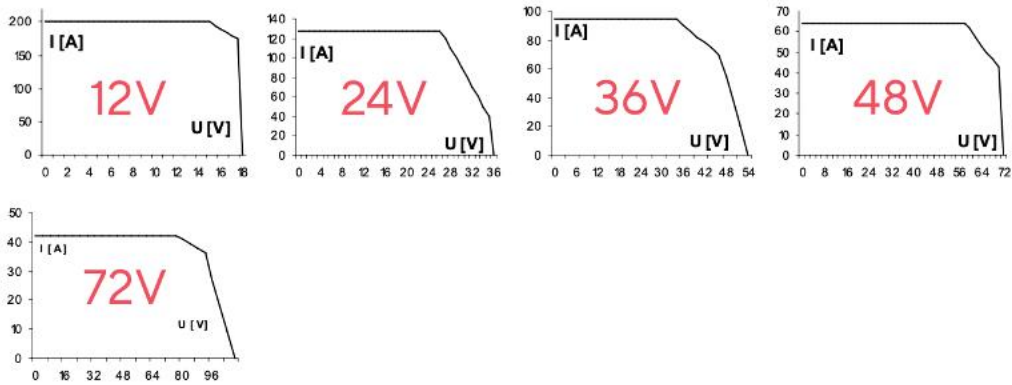
Nominal output voltage / current characteristics 3000W models
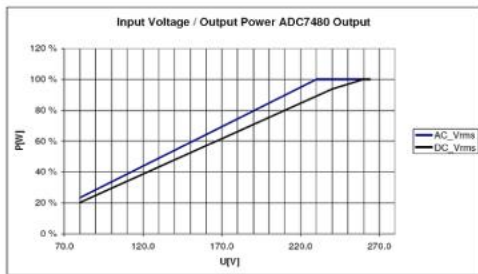
Output power / input voltage derating curve
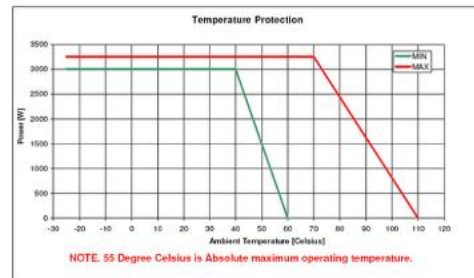
Output power / ambient temperature

INSTALLATION

The location must be dry, dust-free, and indoors. The acceptable temperature range for operation is -20°C to +45°C. A higher ambient temperature will limit the current supply. CAUTION: The charger is not waterproof. Keep it dry and away from areas of high humidity to avoid the risk of electrical shock and damage to the charger. The equipment may be installed either vertically or horizontally. To ensure sufficient ventilation, leave approximately 10 cm of space around all air in- and outlets of the charger. Do not cover the equipment. Defined IP protection is reached if wall assembly used as instruction manual says.

POWER SUPPLY / CHARGING OPERATION

← Ensure that the unit is switched off and that the environment meets the conditions described previous section
↑ Connect the output cables to the load / battery terminals: + cable to the + terminal and - cable to the - terminal.
→ Turn the power on by turning the switch to the I position.
↓ During the normal power supply operation / charging process the STATUS light will show a constant orange light.
° To avoid sparking, turn the power off before disconnecting the cables.

CONNECTION WITH DC INPUT

Wires in PSU's power cable to be connected as follows:
L DC input positive or negative
N DC input negative or positive
PE Ground

OUTPUT VOLTAGE AND CURRENT LIMIT ADJUSTMENT

Trimmer or analog control adjustable modules, type example ADC7480/24 or ADC7480/24AI:
The output voltage and output current limit of the module can be adjusted as follows:
- Trimmer adjustable models: with the multi-turn potentiometer located on the front panel
- Analog controllable models by external 0-5VDC voltage, see detailed instructions
Both voltage and current can be adjusted from zero to maximum value. Maximum 3200W output power is available within the adjustment range.

Temp. comp. models, type example ADC7480/24T:
Unit includes 16pcs of programmed output voltages, see temp. comp. models setting tables page. Any of these 16 different voltage settings can be taken in use. See instructions for choosing the programmed voltage.

LED

A orange LED indicates that the output of the charger module is healthy.

RELAY ALARM

Alarm relay indicates presence of AC input and charger failure. Both normally closed signals and normally open contacts are available.

OUTPUT OVERCURRENT PROTECTION

Output of the unit is protected against over current and short circuits by automatic, self-resetting electronic current limit.

SERIES / PARALLEL CONNECTION

Parallel operation: Passive load sharing. External series diodes are needed for redundant n+1 systems. Series operation: Up to 500V total voltage

WARNING!
Dangerous voltages, capable of causing death, are present in this equipment. Do not remove the cover. No operator serviceable parts inside. Refer servicing to qualified service personnel.

SELECTION TABLE OF ADC7480 FEATURES

| **SELECTION TABLE OF ADC7480 FEATURES**								
This table shows which features are possible at the same time. IF N THEN then not possible. Some of allowed combinations are optional. Contact manufacturer or your local distributor for further details.	Trimmer	Analog	Relay	Bus Out	Bus In	Temp	Sense	Code Switch
Trimmer adjustment		N			N	N		N
Analog control (isolated)	N				N	N		N
Relay alarm			N					
Bus Out (RS-232 control to slave)				N				
Bus In	N	N						
Temp.comp.	N	N						
Sense								
Customised charging algorithm chargers with code Switch	N	N						

PIN CONFIGURATION, MODULAR CONNECTORS

Front panel
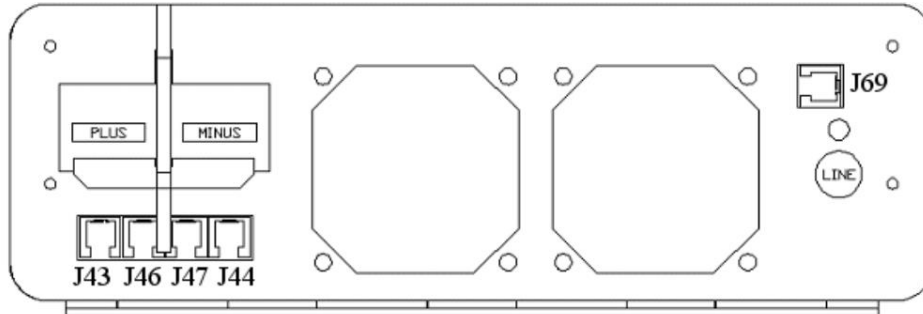
| J43 | Relay Alarm option |
J46	Digital serial bus out, control for external relay
J47	Digital serial bus in option
J44	Temperature compensation and Sense options
J69	Not in use (reserved factory testing)

Rear panel
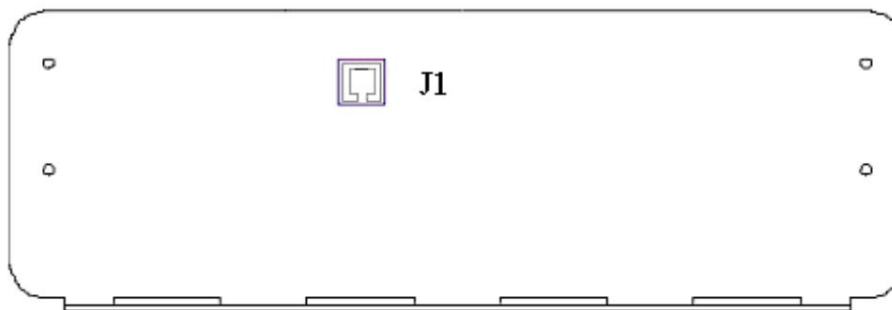
| J1 | Analog control, isolated (for example type ADC7480/24AI) |

OPTIONAL ANALOG CONTROL VERSIONS, ISOLATED

Analog control option allows full control for output current and voltages and it gives measured values for both of these. There is also available +5V internal power source for logic use. The analog input have 500V electrical insulation to power supply's input and output.

PIN CONFIGURATION, MODULAR CONNECTOR

Interface to analog control card is made through AMP Modular 6 connector. It's part number is 215-876-1. The product specification number is 108-19064 and application number is 114-19019. Part number for cable connector that fits to modular 6 is 737 336-1.
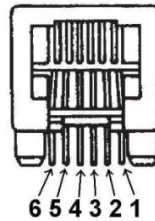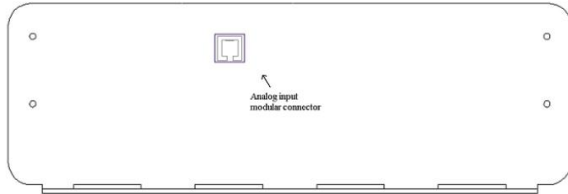
Pin configuration:
1. Ground
2. Target value for current
3. Target value for voltage
4. Measured value for current
5. Measured value for voltage
6. +5V, (max 20mA) output

Controlling analog card:

All control voltages must be between 0 and 5 volts. Over 5V steering is not allowed. Logic for steering is positive so 5V in target value means maximum value from power supply and 0V means minimum output. If controlling connector is unplugged from modular connector, the power supply takes it's minimum values for output.

Measured values can be read from measured signals. Measured voltages are scaled equal as target values. If power supply lies on it's voltage reference, then measured voltage should be equal as target. Same thing on current steering and it's measured value. Measured signals (both together) can be loaded only 20mA or proper operation is not guaranteed.

Modular connector is isolated from power supply's input, enclosure and output terminals. That allows serial and parallel connection to separate power supply's so that equal steering voltages are used. Number or connected devices are not limited. Only be sure that 500V insulation voltage is not exceeded. If connector in analog card is not a modular connector (9 pin D-connector), it is a different version of analog controlled power supply and this manual is not valid to it.

Connection example, using internal +5VDC power source and external potentiometers:
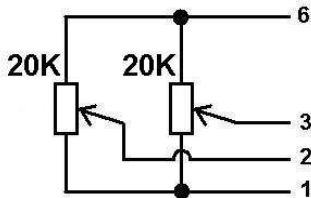
+5V output can be used to feed logic voltages for external circuits. Connection in an example works as a potentiometer controlled power supply. It is important to notice that +5V output is not allowed to load more then 20mA or proper operation is not guaranteed.

Tuning instructions:
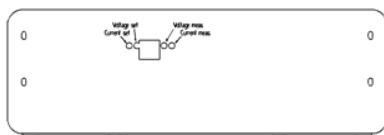

ADC7480 front panel

Location of tuning trimmers for analog control Trimmers are covered by sticker

Attention !!!
Analog interface is tuned in a factory before it is delivered to customer. There should not be any reason for tuning if card is used between 0-5V voltage values. Qualified person is needed for tuning the device. Tuning can be done with a pair of digital multi meters and example schematic above. Procedure is following:
1. Adjust from potentiometers 5V to voltage target and 2V for current target. Connect digital voltage meter to power supply output. Tune from "Voltage Set" trimmer maximum output voltage to right value.
2. Connect digital voltage meter to Modular pin number 5. Tune from trimmer "Voltage Meas" so that digital voltage meter shows always equal value as is in pin 3 (target voltage).
3. Connect digital current meter to output so that it short-circuits the output. Now tune current target potentiometer to 5V. Tune from "Current Set" trimmer output current to value that is maximum value for device according to it's specification. Be sure that your current meter has a right range. Do never exceed the current values that are specified for the device. If specified value is not known, take a contact to distributor.
4. Measure with digital multi meter voltage from Modular connector pin 4 Tune from trimmer "Current Meas" to equal with voltage in modular pin 2 (Target Current).

OPTIONAL RELAY ALARM, TEMP.COMP, SENSE AND SERIAL BUS VERSIONS
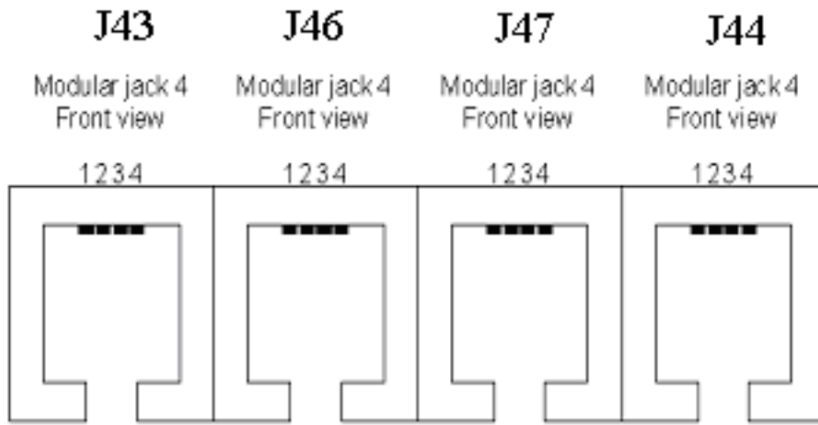
J43: pin1= Not connected
J43: pin2= Relay contact common
J43: pin3= Relay contact normally closed
J43: pin4= Relay contact normally open

J46: pin1= Relay control +
J46: pin2= Serial bus gnd
J46: pin3= Relay control gnd
J46: pin4= Serial bus out col. (+)

J47: pin1= Not connected
J47: pin2= Serial bus gnd
J47: pin3= Not connected
J47: pin4= Serial bus in

J44: pin1= Sense plus (+)
J44: pin2= Temp sens (+)
J44: pin3= Temp sens (-)
J44: pin4= Sense minus (-)

TEMPERATURE COMPENSATION MODELS, type number example ADC7480/24T
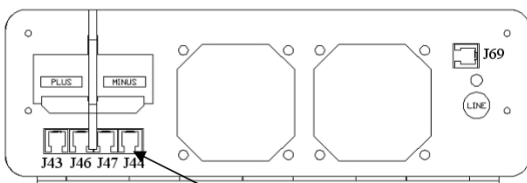
The temp. comp cable enables the charger to adjust the output voltage in accordance with battery voltage and temperature fluctuations. See instructions for changing and adjusting the output voltage.

OPTIONAL MASTER SERVANT CONNECTION

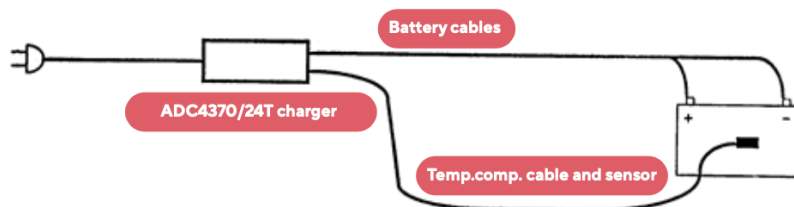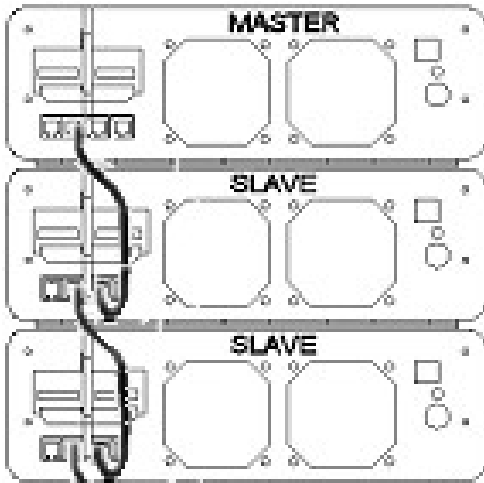**Using master power supply together with Servant unit.**

Master unit can be trimmer adjustable standard model ADC7480/24 or analog controllable model ADC7480/24AI (24V as an example).

Note !

Unit with relay alarm, type example ADC7480/24H can't be used as a master unit.

Servant unit is separate unit without adjustment possibility, type ADC7480/_ _ S.

Connecting two or more ADC7480 units in series or parallel increases the output supply current or voltage. The output voltage and current of the master unit can be controlled by trimmers or by external analog control. The bus output from the master is connected to the first servant unit, which voltage / current equals to masters settings. More power can be provided by connecting more servant units to the chain. The connection principle is illustrated in the picture.

PROGRAMMED VOLTAGES FOR TEMP.COMP. MODELS, type number example ADC7480/24T

ADC7480/12T 12VDC 200A

Code switch position	Nominal Battery voltage	Voltage factory setting	Output Current	Factory default
0		3,3 VDC	200 A	
1		5 VDC	200 A	
2	6 VDC	6,75 VDC	200 A	
3	6 VDC	6,85 VDC	200 A	
4	6 VDC	6,9 VDC	200 A	
5		12 VDC	200 A	
6	12 VDC	13,4 VDC	200 A	
7	12 VDC	13,5 VDC	200 A	
8	12 VDC	13,6 VDC	200 A	
9	**12 VDC**	**13,7 VDC**	**200 A**	**X**
A	12 VDC	13,7 VDC	133 A	
B	12 VDC	13,7 VDC	67 A	
C	12 VDC	13,8 VDC	200 A	
D	12 VDC	13,9 VDC	200 A	
E	12 VDC	14 VDC	200 A	
F		15 VDC	200 A	

ADC7480/24T 24VDC 127A

Code switch position	Nominal Battery voltage	Voltage factory setting	Output Current	Factory default
0		12 VDC	127 A	
1	12 VDC	13,4 VDC	127 A	
2	12 VDC	13,7 VDC	127 A	
3	12 VDC	13,8 VDC	127 A	
4		24 VDC	127 A	
5	24 VDC	26,8 VDC	maximum	
6	24 VDC	27 VDC	maximum	
7	24 VDC	27,2 VDC	maximum	
8	24 VDC	27,3 VDC	maximum	
9	**24 VDC**	**27,4 VDC**	**maximum**	**X**
A	24 VDC	27,4 VDC	85 A	
B	24 VDC	27,4 VDC	42 A	
C	24 VDC	27,5 VDC	maximum	
D	24 VDC	27,6 VDC	maximum	
E	24 VDC	27,8 VDC	maximum	
F	24 VDC	28 VDC	maximum	

ADC7480/36T 36VDC 95A

Code switch position	Nominal Battery voltage	Voltage factory setting	Output Current	Factory default
0	12 VDC	13,7 VDC	95 A	
1		24 VDC	95 A	
2	24 VDC	27,4 VDC	95 A	
3	30 VDC	34,25 VDC	95 A	
4		36 VDC	maximum	
5	36 VDC	40,2 VDC	maximum	
6	36 VDC	40,5 VDC	maximum	
7	36 VDC	40,8 VDC	maximum	
8	36 VDC	40,95 VDC	maximum	
9	**36 VDC**	**41,1 VDC**	**maximum**	**X**
A	36 VDC	41,1 VDC	63 A	
B	36 VDC	41,1 VDC	31 A	
C	36 VDC	41,25 VDC	maximum	
D	36 VDC	41,4 VDC	maximum	
E	36 VDC	41,7 VDC	maximum	
F	36 VDC	42 VDC	maximum	

ADC7480/48T 48VDC 64A

| Code switch position	Nominal Battery voltage	Voltage factory setting	Output Current	Factory default
0	12 VDC	13,7 VDC	64 A	
1	24 VDC	27,4 VDC	64 A	
2	36 VDC	41,1 VDC	64 A	
3		48 VDC	64 A	
4	48 VDC	53,6 VDC	maximum	
5	48 VDC	54 VDC	maximum	
6	48 VDC	54,4 VDC	maximum	
7	48 VDC	54,6 VDC	maximum	
8	**48 VDC**	**54,8 VDC**	**maximum**	**X**
9	48 VDC	54,8 VDC	43 A	
A	48 VDC	54,8 VDC	21 A	
B	48 VDC	55 VDC	maximum	
C	48 VDC	55,2 VDC	maximum	
D	48 VDC	55,6 VDC	maximum	
E	48 VDC	56 VDC	maximum	
F		60 VDC	200 A	

Factory default code switch position by bold in tables

ADC7480/72T 72VDC 42A

Code switch position	Nominal Battery voltage	Voltage factory setting	Output Current	Factory default
0	24 VDC	27,4 VDC	42 A	
1	36 VDC	41,1 VDC	42 A	
2	48 VDC	54,8 VDC	42 A	
3		60 VDC	42 A	
4	60 VDC	67,5 VDC	42 A	
5	60 VDC	68 VDC	42 A	
6	60 VDC	68,5 VDC	42 A	
7	60 VDC	68,5 VDC	21 A	
8	60 VDC	68,8 VDC	42 A	
9		72 VDC	42 A	
A	72 VDC	81 VDC	maximum	
B	72 VDC	81,6 VDC	maximum	
C	**72 VDC**	**82,2 VDC**	**maximum**	**X**
D	72 VDC	82,2 VDC	20 A	
E	72 VDC	82,2 VDC	14 A	
F	72 VDC	82,5 VDC	maximum	

Facory default code switch osition by bold in tables

INSTRUCTION TO CHANGE THE PROGRAMMED VOLTAGE FOR TEMP.COMP./SENSE MODELS, type number example ADC7480/24T

← Disconnect the power cord from the power line.
↑ Disconnect the output cables from the battery to be charger.
→ See the current code switch position of the unit.
↓ See new switch position code from the programmed output voltages sticker on the unit.
° Rotate the code switch under the sticker to the required position.
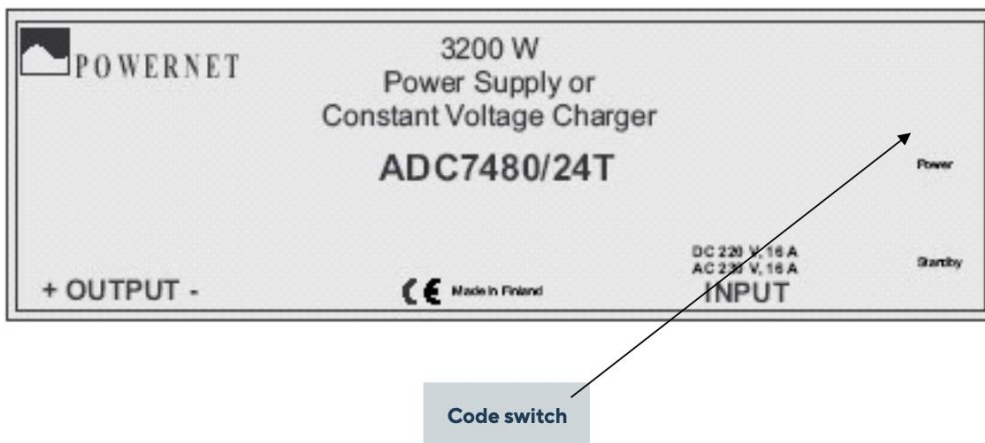
The adjustment can be checked as follows:

Short-circuit the output cables of the charger (output short circuit). Connect the charger to the power line.
Follow the Status-led color. Switch the charger on from the on/off switch. Count all the number of green blinks.
There must be as much number of blinks as the code switch position number is.

Note!
If the position of the code switch is O, Status-led blinks only once and returns to red. The code switch positions A...F respond numbers 10...15

Now the charger has been adjusted!

HINTS IF NOT SUCCEED

You didn't have chance to count the number of blinks
=> You can start the test with the on/off switch of the charger again and count.

You have made the wrong setting
=> Switch the charger off again and make the correct setting and count the blinking to check.

You cannot find the required charging algorithm on list available
=> Contact the seller / importer and ask if the charger can be up dated with the algorithm you need.