TYCON Power®

TPDIN-SC48-20
MPPT Solar Controller with PoE Switch

- Wireless Base Stations and Client Devices
- Surveillance Cameras
- Remote Control
- Remote Lighting
- Off Grid Electronics

Congratulations! on your purchase of the TPDIN-SC48-20 20A MPPT Solar Controller with 7 Port Gigabit PoE Switch. Please take a moment to review this Qwik Install Guide before use.

Please take serious note of the following warnings:

WARNING: **Do Not Reverse PV Connection Polarity.**

WARNING: **Do Not Connect PV to Battery Input.**

WARNING: **Do Not Reverse Battery Polarity.**

WARNING: **Always connect battery first and disconnect battery last.**

Permanent Damage to your Unit Will Result !

Safety: For your own protection, follow these safety rules.

- **Perform as many functions as possible on the ground**
- **Do not attempt to install on a rainy, windy or snowy day or if there is ice or snow accumulation at the install site or if the site is wet.**
- **Make sure there are no people, pets, etc. below if you are working on a roof or ladder.**

Recommended Tools: Small Flat Blade Screwdriver, Phillips Screwdriver

Important!: Before you get started, please go to tyconsystems.com/support/firmware, download the latest firmware for your particular model and upgrade the unit.

Security: Please be sure to set a username and password on the Network page to secure the user interface. Also set your own Telnet username/password and enable Telnet so that you can reboot the unit remotely in case of a browser access issue.

Qwik Install

STEP 1: Remove Large 4 Pin and Small 2 Pin Green connectors from the accessory bag.

STEP 2: Attach the TPDIN-SC48-20 to a DIN Rail mount. To mount to a flat plate remove the DIN Rail bracket from the back by removing 5 screws and mount to a plate using the two wall mount tabs provided. There is a green ground screw for connecting one of the tabs to earth or chassis ground. **Important!** Please make sure that the air flow to the bottom and top of unit is not blocked or unit may overheat and shut down.

Note: The Unit is removed from the DIN rail by pushing up on the unit and at the same time moving the bottom of the unit forward.

STEP 3: Attach 48VDC battery wires (BAT+ and BAT-) and solar panel wire (PV--) to the Large Green connector. Make sure the 3 connections are tight in the connectors and not clamping on wire insulation. **IMPORTANT! Make sure the polarity is correct. Damage to the unit can occur if polarity is reversed or if PV wires are connected to the battery input.**

STEP 4: Double check the wiring is correct and then plug the Large Green connector into the top of the controller. The Charging LED on the front panel should light for about 60 sec. Now connect the PV+ wire to the green connector. **Note:** Always connect battery first and disconnect battery last from the controller.

Note: All LED's except the Charging LED will initially be off until the settings are changed in the web user interface.

STEP 5: If you will be using the Aux Output, connect your load wires to the Small Green 2 Pin Connector. Be sure the wire connections are tight. Be sure the voltage polarity is correct. Plug the Aux connector into the Aux Output socket. If you won't be using the Aux Output, just plug the empty connector into the socket.

STEP 6: Connect Thermocouple cable to the 2 pin green connector. The Thermocouple does not have a polarity. Connect the Thermocouple cable assembly ring lug to one of the battery terminals. It can be
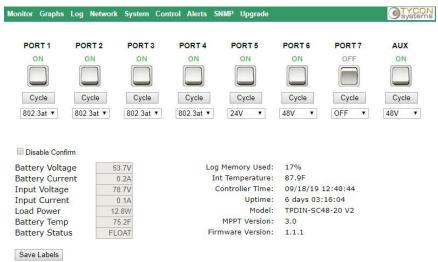
connected to the + or - terminal. Plug the thermocouple 2 pin green connector to the socket labelled "Temp Sensor".

STEP 7: There is an amber LED which will light on any PoE port that has power. If the amber LED is off it means the power is off to that port. By default all ports are off. Connect your network or PC to one of the unpowered ports, preferably one of the 802.3at ports 1-4.

STEP 8: The default IP address is 192.168.1.6 The unit may also get an IP address from a DHCP server. We have a free Java based discovery tool available at tyconsystems.com/support/firmware. Your PC needs to have Java installed (*java.com*).

  This tool will find the controller no matter what IP address it is on, even across subnets. Your computer IP address will need to be on the same subnet as the controller in order to access the web browser control panel of the controller.

STEP 9: Open your browser and type the IP address of the controller into the browser address field. Navigate to the **Monitor Page**. This is where you can setup the port output voltages (24V or 48V or 802.3at or OFF), set port labels, and see information such as battery status, temp, input voltages/currents and load power.

Battery Voltage: Shows the present battery voltage.

Battery Current: Shows current flowing into or out of the battery. A positive current means the battery is charging. A negative current means the battery is discharging.

Input Voltage: Shows the voltage at the PV input connector.

Input Current: Shows the solar panel or DC input current.

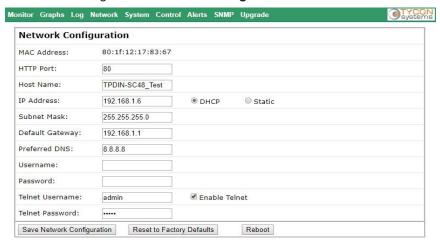**Load Watts:** Shows the total power being supplied to all loads.

Battery Temperature: Shows the temperature of the battery. FAULT means the temp probe is disconnected.

Battery Status: Shows charge state when charging (Bulk, Float) and shows capacity % when discharging.

NOTE: Double check the port voltage setting for each port and then connect all your devices to the controller switch ports.

IMPORTANT! Please be sure to make sure you are using the correct PoE voltage. Do not turn on the port power to the specific port until you double check that the device that is plugged in is compatible with the PoE voltage selected. PoE voltage is supplied on Ethernet pins 4,5(V+) and 7,8(V-). Note: Ports 1-4 can be set to 802.3at compatible PoE.

STEP 10: Navigate to the **Network Page**

Monitor	Graphs	Log	Network	System	Control	Alerts	SNMP	Upgrade		TYCON systems

Network Configuration

MAC Address:	80:1f:12:17:83:67
HTTP Port:	80
Host Name:	TPDIN-SC48_Test
IP Address:	192.168.1.6 ⦿ DHCP ○ Static
Subnet Mask:	255.255.255.0
Default Gateway:	192.168.1.1
Preferred DNS:	8.8.8.8
Username:	
Password:	
Telnet Username:	admin ☑ Enable Telnet
Telnet Password:	•••••

[Save Network Configuration] [Reset to Factory Defaults] [Reboot]

This is where you can change the communications port, IP Address, set user names and passwords. Be sure to set username and password to secure the user interface. Also set your own username and password for Telnet and enable Telnet so you will have the ability to reboot the unit remotely if you can't access through a browser.

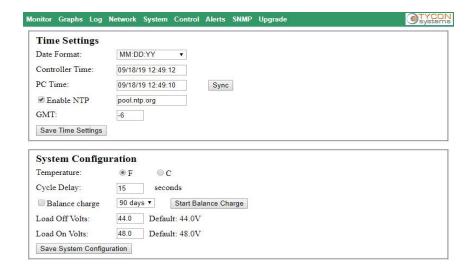**STEP 11:** Navigate to the **System Page**.

This is where you can set the time settings and Misc System settings.

Time Settings: Enable and set Network Time Protocol (NTP) and set time zone (Mountain time is GMT –7). Sync internal clock with PC.

System Configuration:

Set temperature default units as deg F or C.

Set cycle delay: When cycle is clicked on a port on the monitor page,

Time Settings

Date Format:	MM:DD:YY ▾
Controller Time:	09/18/19 12:49:12
PC Time:	09/18/19 12:49:10 [Sync]
☑ Enable NTP	pool.ntp.org
GMT:	-6

[Save Time Settings]

System Configuration

Temperature:	⦿ F ○ C
Cycle Delay:	15 seconds
☐ Balance charge	90 days ▾ [Start Balance Charge]
Load Off Volts:	44.0 Default: 44.0V
Load On Volts:	48.0 Default: 48.0V

[Save System Configuration]

the port will cycle to the opposite state and wait till the cycle time expires, then revert to it's original state.

Balance Charge: Sometimes it's beneficial to do a balance charge on the batteries to balance all the batteries within an array. The balance charge shouldn't be done too often or the life of the batteries will be reduced. The interface allows an automatic balance charge every 60 days or 90 days. We recommend 90 days or disabled. You can also force a balance charge (Equalization charge). It will start the next time the controller goes to Bulk charge mode.

Load Off and Load On Volts: When the battery voltage falls below the Load Off voltage, the load is turned off and when it rises above the Load On voltage, the load is turned back on. We recommend using the default values.
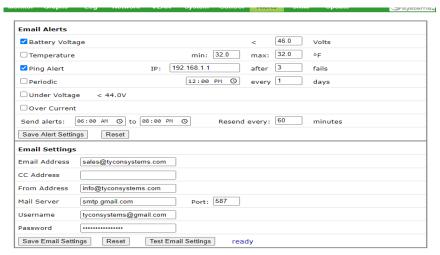
STEP 12: Navigate to the **Control Page**.

Aux Control: AUX   [Save Aux Control]

☐ Time Control:	from 12:00 PM	to 12:00 PM		- ▾	else	- ▾
☐ Temp Control:	from 32.0	to 77.0 °F		- ▾	else	- ▾
☐ Battery Voltage:	Hysteresis: 1.0 V	from 0.0	to 0.0 Volts	- ▾	else	- ▾
☐ Ping Control:	0.0.0.0		if 5 fails	- ▾	else	- ▾

Port Control: PORT 1 ▾   [Save Port Control]

☐ Time Control:	from 12:00 PM	to 12:00 PM		- ▾	else	- ▾
☐ Temp Control:	from 32.0	to 77.0 °F		- ▾	else	- ▾
☐ Battery Voltage:	Hysteresis: 1.0 V	from 0.0	to 0.0 Volts	- ▾	else	- ▾
☐ Ping Control:	0.0.0.0		if 5 fails	- ▾	else	- ▾

Port Control: PORT 1 ▾   [Save Port Control]

☐ Time Control:	from 12:00 PM	to 12:00 PM		- ▾	else	- ▾
☐ Temp Control:	from 32.0	to 77.0		- ▾	else	- ▾
☐ Battery Voltage:	Hysteresis: 1.0 V	from 0.0	to 0.0 Volts	- ▾	else	- ▾
☐ Ping Control:	0.0.0.0		if 5 fails	- ▾	else	- ▾

This is where you can setup ping control and other available controls for the ports. The controls are separate into 1 set of controls for the Auxiliary port and another set of controls for the PoE ports. Controls available are Time Control, Temperature Control, Battery Voltage Control, and Ping Control. You can use multiple controls providing for compound functionality. When more than 1 control is enabled, the priority is top to bottom.

The controls have 3 available actions: On, Off or Cycle. They also have an ELSE action. For instance if a user wants to turn on a port only during a certain time like from 8AM to 5PM, they would set the time from 8:00AM to 5:00PM then select ON else OFF. This would turn the port on only from 8:00AM to 5:00PM and it would be off the rest of the day.

STEP 13: Navigate to the **Alerts Page**.

This is where you setup the email alerts. You can set one or multiple alert triggers based on Battery Voltage, Battery Temperature, Ping Alert, Periodic Alert, If the unit is in an under-voltage shutdown condition or if the unit is in an overcurrent condition.

If there is an ongoing error condition you can specify how often you want to see an alert while the error condition is still active. In the example above we have it set to send an email every 60 minutes.

Be sure to specify the SMTP server port and credentials. You can send alerts to two separate email addresses. The TPDIN-SC48-20 V2 supports port 25 (non-SSL) and port 587 (TLS).

STEP 14: Navigate to the **VLAN Page** if you need to setup VLANS.

Each port can be setup on a different VLAN. Also the WEB interface can be assigned to a VLAN. Don't modify unless you are familiar with VLANS, or else you might lose connectivity to the unit.

SPECIFICATIONS

Subject to change without notice

	TPDIN-SC48-20 V2
Controller Type	MPPT
Solar Input Voltage	56VDC to100VDC
Max Solar Panel Open Circuit Volts (Voc)	100VDC over full temp range
Max Solar Panel Power Voltage (Vmp)	90VDC
Solar Input Current	20A Maximum
Battery Voltage	48VDC
Battery Current	20A Maximum
Fuse Type	58V 20A Auto Mini Blade (Littlefuse 0997020.WXN)
Low Voltage Disconnect	42V to 48V
Low Voltage Disconnect Recovery	44V to 54V
Battery Type	GEL or AGM or Lithium
PoE Switch	Qty 7 10/100/1000Mb
PoE Output Power	Port 1-4 0.645A 802.3at or Passive Port 5-7 0.645A Passive
Port Surge Protection	15KV
Auxiliary Output	3A Max
Measurement Accuracy (V / I / T)	+/-0.1V, +/-0.1A, +/-1Deg
Power Consumption	3.5W typ
Data Logger	FIFO, 15,000 records
Wire Size	8AWG Solar/Batt 12AWG Aux Output
Operating Temperature	-40C to +65C
Operating Humidity	0% to 90%
Warranty	3 Years

TECH CORNER
Additional Information you may find useful

RESET TO FACTORY DEFAULTS: There is a button on the top of the controller labelled FACTORY DEFAULT. Pressing and holding this button for over 5 seconds will reset to factory defaults.

RESET the CONTROLLER: There is a button on the top of the controller labelled RESET. Pressing this button immediately resets the controller. This is the same as power cycling the controller.

FRONT PANEL LED's:

Charging— Solid *Green (Bulk) , Flashing (Float)*
Aux Output—*24V Green / 48V Orange*
Overload—*Red (The load is drawing too much power)*
Overload will also light during firmware upgrade. This is normal.

UPS (non solar) Operation: The unit can also be used as a high powered UPS or battery backup system by providing 56VDC to 80VDC 18A into the PV +and - inputs. Tycon® offers a AC to 72VDC power supply to accomplish this. The power supply can be connected in parallel with PV panels. The PV connection will need a special blocking diode to prevent reverse current flowing to the solar panels. Tycon offers a blocking diode (pn 5600059).

SNMP: The controller can be accessed via HTTP or SNMP or Telnet. SNMP enables remote management via an SNMP control server. MIB file can be found at tyconsystems.com/support/firmware

GRAPHS: The graphs show the data in the LOG file. If there is no data in the log file there will be no graph display. Turn on logging on the System page by setting a Log Interval. Graphs can be captured to a graphics file using any screen capture program including the Snipping Tool supplied with Windows.

LOG: The log displays all the important events which happen in the device in addition to the data logging. Please note that after a reset or power cycle the log file may show a random date and time until it can recapture the correct time.

To export the log file to Excel go to the Log page and click on Download Log File. Open excel and then open the downloaded text file in Excel. Choose space delimited when opening the file. This will import to excel with all the data columns intact.

Limited Warranty

The TPDIN-SC48-20 Solar Controller with PoE Switch is supplied with a limited 36 month warranty which covers material and workmanship defects. Following not covered::

- Parts requiring replacement due to improper installation, misuse, poor site conditions, faulty power, etc.
- Lightning or weather damage including water damage.
- Physical damage to the external & internal parts.
- Products that have been opened, altered, or defaced.
- Usage other than in accordance with instructions and the normal intended use.

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