

TWE-180-09_Plus

Preliminary Data Sheet Rev.2

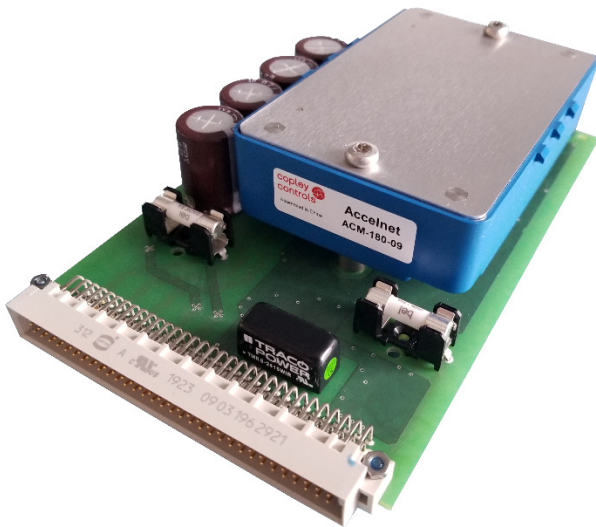


Figure 1: TWE-180-09_Plus

- **Input Power:**
 - 20-180 Vdc (DC-Link Voltage)
 - 3 Adc / 9 Adc peak
 - 11-30 Vdc (Auxiliary Supply)
- 3 Phase MOSFET Inverter
- 15 KHz PWM
- Space-Vector Modulation
- **Communication:** RS-232 / ASCII
- **Current Command:** ± 10 Vdc Analog
- **Feedback:** Digital Halls
- **Dimensions:** 110 x 183 x 38.5 [mm]
- **19 Inch DIN Rack Mounting**

Description

The TWE-180-09_Plus is a single channel drive controller for 19 Inch DIN rack mounting.

It represents a compatible replacement of the obsolete TWE-120-05 with several additional modern features:

- Digital control of brushed or brushless motors with modern control algorithms.
The new TWE-180-09_Plus has been built based on a Copley ACM-180-09, mounted on an adapter card for 19 inch rack mounting.
- Parameter storage in non-volatile flash memory.
- Digital RS232 communication interface on the front side to connect a Windows® PC for easier commissioning and control loop tuning, automatic phase recognition, and advanced fault analysis.
- Scope functionality for visualization of internal parameters over time on a connected PC.
- Modular hardware design: The mounted Copley controller can be easily exchanged on the 19 Inch adapter card without soldering.
- High quality long life DC-link capacitors on the 19 Inch adapter card.

Technical Specification

The main technical characteristics of the controller are as follows (from the official ACM handbook):

GENERAL SPECIFICATIONS

Test conditions: Load = Wye connected load: 1 mH+ 1Ω line-line. Ambient temperature = 25 °C. +HV = HV_{max}

MODEL	ACM-055-18	ACM-090-09	ACM-090-24	ACM-090-60	ACM-180-09	ACM-180-18	ACM-180-20	
OUTPUT POWER								
Peak Current	18 (12.7)	9 (6.34)	24 (17.0)	60 (42.4)	9 (6.34)	18 (12.7)	20 (14.14)	Adc (Arms)
Peak time	1	1	1	1	1	1	1	Sec
Continuous current	6 (4.24)	3 (2.1)	12 (8.5)	30 (21.2)	3 (2.1)	6 (4.24)	10 (7.1)	Adc (Arms)
Peak Output Power	0.99	0.81	2.16	5.4	1.62	3.24	3.6	kW
Continuous Output Power	0.33	0.27	1.08	2.7	0.54	1.08	1.8	kW
INPUT POWER								
HVmin to HVmax	+20 to +55	+20 to +90	+20 to +90	+20 to +90	+20 to +180	+20 to +180	+20 to +180	Vdc
Ipeak	18	9	24	60	9	18	20	Adc
Icont	6	3	12	30	3	6	10	Adc
Aux HV	+20 to HVmax		2.5 W max		Optional keep-alive power input when +HV is removed			
PWM OUTPUTS								
Type	MOSFET 3-phase inverter, 15 kHz center-weighted PWM carrier, space-vector modulation							
PWM ripple frequency	30 kHz							
BANDWIDTH								
Current loop, small signal	2.5 kHz typical, bandwidth will vary with tuning & load inductance							
HV Compensation	Changes in HV do not affect bandwidth							
Current loop update rate	15 kHz (66.7 μs)							
Position & Velocity loop update rate	3 kHz (333 μs)							

A detailed description of the ACM controller can be found in the official manual of the controller on www.copleycontrols.com

Important Notes:

- Please read the Copley ACM manual before connecting and powering the device.
- Only qualified personal is allowed to unpack, handle, connect and power the device.
- The controller is ESD-sensitive.
- Danger of hazardous voltages! Only trained and certified personal should use this device!
- There is no galvanic isolation between control-circuits and the DC-link. Please refer to the Copley manual for further details.
- The aluminum surface of the mounted Copley Controller (acts as heatsink) is connected with Minus DC-Link.
- After long storage times (more than 2 years) the DC-link capacitors need a reforming procedure before applying supply voltage, otherwise the controller might be destroyed.
- In case of a damaged fuse please contact MACCON. For fuse replacement only use original MACCON spare parts because of their special interruption behavior.

Interface description

The TWE-180-09_Plus is basically an ACM-180-09 on an interface card. The device is connected to the adapter card via J1 and J2. Its connections are routed to X1, X2 and the feedback LEDs.

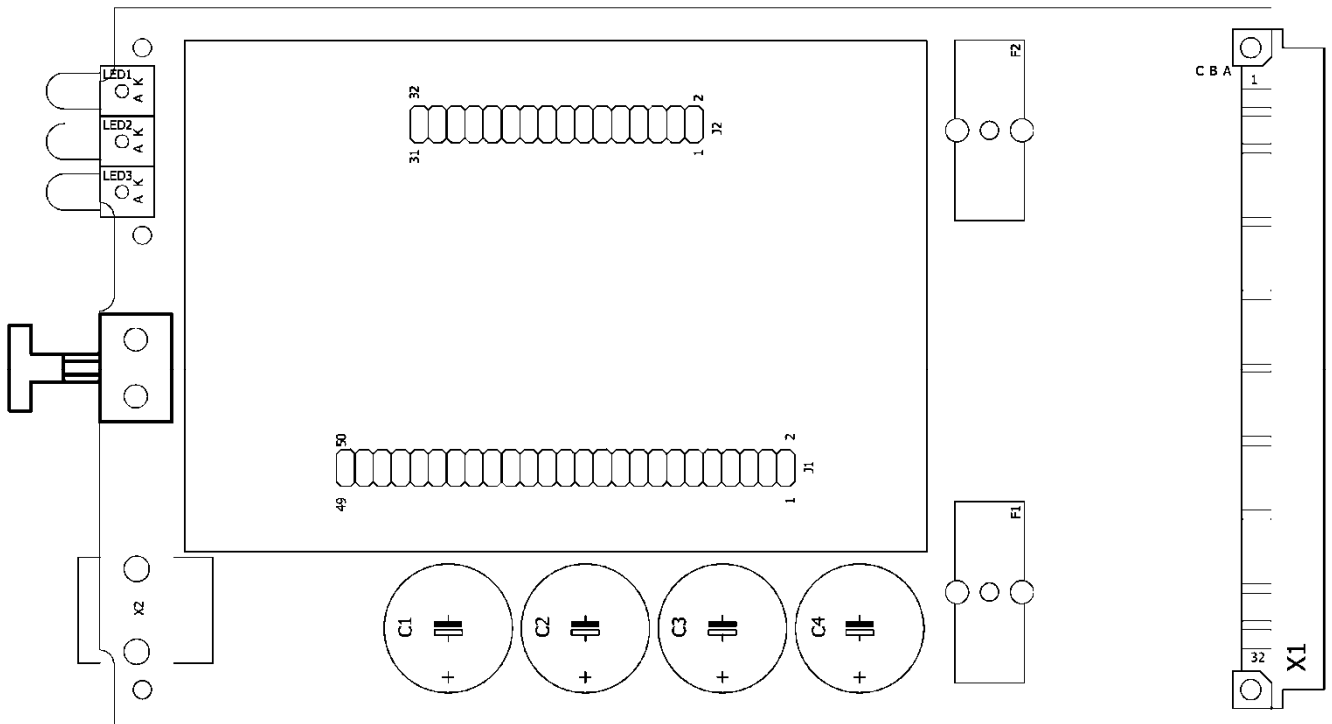


Figure 2: TWE-180-09_Plus component layout

The 3 LEDs (top left on Figure 2) offer quick feedback about drive status:

➤ LED1: (red)

During normal operation this LED is not active. Once the controller detects a fault, this LED will be red. In case a fault is detected, please connect to the drive via the serial interface (X2) to access the controller via the CME software. Once connected, the tool provides useful data about the detected fault.

One of the fault conditions is under voltage (measured on the DC-link). As long no DC-link voltage is present, this fault will be triggered. Please apply a DC-link voltage of at least 25 V to disable this error. Once a voltage of at least 25 V is measured on the DC-link, this fault will be deactivated and the controller can continue to work.

➤ LED2: (green):

Once the auxiliary supply is active, this LED emits a green light.

➤ LED3: (orange)

The diode provides feedback about DC-Link voltage. The intensity of this LED is directly proportional with the DC-link voltage.

The TWE-180-09_Plus is protected by 2 fuses: F1 (5A) and F2 (1.25 A).

The main connector (X1) is a 3 row 96 pin connector. Pin description of X1 is available in Table 1.

Table 1: Pin description of X1

X1 connections			
Pin	A	B	C
1	+15VDC	n.c.	n.c.
2	n.c.	n.c.	GND
3	SYN-W	SYN-V	SYN-U
4	n.c.	ANA-IN	GND
5	n.c.	n.c.	n.c.
6	RESET	n.c.	n.c.
7	n.c.	n.c.	n.c.
8	n.c.	n.c.	n.c.
9	n.c.	n.c.	n.c.
10	n.c.	n.c.	n.c.
11	n.c.	n.c.	n.c.
12	n.c.	n.c.	/EN-MON
13	n.c.	n.c.	n.c.
14	n.c.	n.c.	n.c.
15	n.c.	n.c.	n.c.
16	n.c.	ENAB-IN	SIGN
17	n.c.	/READY	DIG-IN
18	DC-Link +	DC-Link +	DC-Link +
19	DC-Link +	DC-Link +	DC-Link +
20	DC-Link +	DC-Link +	DC-Link +
21	DC-Link - (GND)	DC-Link - (GND)	DC-Link - (GND)
22	DC-Link - (GND)	DC-Link - (GND)	DC-Link - (GND)
23	DC-Link - (GND)	DC-Link - (GND)	DC-Link - (GND)
24	PHASE-U	PHASE-U	PHASE-U
25	PHASE-U	PHASE-U	PHASE-U
26	PHASE-U	PHASE-U	PHASE-U
27	PHASE-V	PHASE-V	PHASE-V
28	PHASE-V	PHASE-V	PHASE-V
29	PHASE-V	PHASE-V	PHASE-V
30	PHASE-W	PHASE-W	PHASE-W
31	PHASE-W	PHASE-W	PHASE-W
32	PHASE-W	PHASE-W	PHASE-W

Additional to X1, there is a serial communication interface, realized over X2, for commissioning, tuning and fault analysis. The CME2 software connects to the ACM-180-09 via this interface. Pin description of X2 is available in Table 2.

Table 2: Pin description of X2

X2 connections	
Pin	Description
1	n.c.
2	n.c.
3	Rx Data
4	GND
5	GND
6	Tx Data
7	n.c.
8	n.c.

The drive is preconfigured for torque control mode. The reference current is provided via the analog input (± 10 Vdc), which is scaled to (± 5 A). The controller can operate at a continuous current of 3 Adc, however for a short time (1 sec) it can drive up to 9 Adc. Due to the scaling of ± 10 Vdc to ± 5 Adc, the highest current reference can be 5 Adc.

For further technical details please consult the ACM-180-09 datasheet or contact us.