

Twido programmable controller

Compact controllers



TWD LCAA 10DRF



TWD LCAA 16DRF



TWD LCAA 24DRF

Presentation

The Twido Compact line of programmable controllers offers an "all-in-one" programmable controller solution in a 3.2 x 3.5 x 2.8 inch footprint. Three Compact base controllers are available, with different combinations of 24 VDC inputs and relay outputs. All Compact controllers utilize a 100...240 VDC power supply. The Compact controller offers significant advantages to the panel and machine builder:

- The Compact controller's small footprint allows a robust accumulation of I/O in a very small area, thus reducing panel size in applications where space is at a premium.
- A variety of expansion possibilities and product options offer the kind of system flexibility usually reserved for larger controller platforms. The Compact controllers can be configured to include expansion I/O modules (with the TWDLCAA24DRF); option modules, such as an HMI plug-in, memory cartridge, and real time clock; and additional RS 485 or RS 232C communication ports.
- Another benefit of the Compact controller solution is its extreme flexibility in wiring. The Compact line offers an array of cabling choices, such as removable screw terminal blocks and spring-type connectors, which allow for quick, easy wiring with increased reliability. The Twidofast pre-wired cabling solution offers a rapid, reliable connection, combining modules with connectors and cables with flying leads for direct connection to sensors/actuators or to Twidofast kits (cables plus a Telefast sub-base).
- The HMI option and the plug-in memory option allow for easy sharing and updating of programs among controllers. The small HMI display can be used as a local adjustment tool that can be transferred from one CPU to another. The EEPROM in the memory option allows for easy transfer of programs among all controllers - Compact and Modular - in the Twido family.
- TwidoSoft software features easy programming, using the same objects and instructions as the current PL7-07 software. Existing PL7-07 programs can be imported using an ASCII file directly into Twidosoft.
- All Compact controllers have at least one analog potentiometer. The value is stored in system words and is updated every scan.

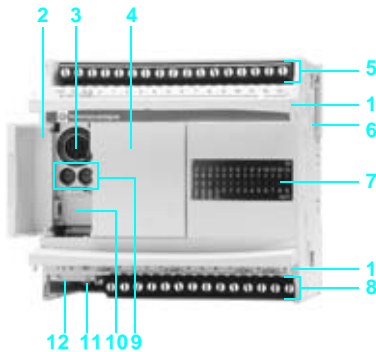
Controller	Digital inputs	Relay outputs	Analog potentiometers	Serial ports	Expansion I/O modules	HMI option module	Optional cartridge
TWD LCAA 10DRF	6	4	1 point from 0...1023	1 x RS 485	No	Yes	One (RTC or memory)
TWD LCAA 16DRF	9	7	1 point from 0...1023	1 x RS 485, in option 1 x RS 232C/485	No	Yes	One (RTC or memory)
TWD LCAA 24DRF	14	10	1 point from 0...1023 1 point from 0...511	1 x RS 485, in option 1 x RS 232C/485	Yes, max of 4 (1)	Yes	One (RTC or memory)

(1) So maximum 88 I/O with screw terminal expansion module, with maximum 32 relay outputs in I/O expansions.

So maximum 152 I/O with HE 10 connector expansion modules.

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Description

Twido TWD LCAA ●● DRF programmable compact base controllers comprise:

- 1 Two hinged connection terminal block covers for access to terminals.
- 2 A hinged access door.
- 3 An RS 485 mini-DIN type serial port connector (enables connection of the programming terminal).
- 4 A slot (protected by a removable cover) for the digital diagnostics/maintenance display TWD XCP ODC.
- 5 A screw terminal block for --- 24 V sensor supply and for connecting input sensors.
- 6 An I/O expansion module connector (for the 24 input/output model).
- 7 A display block showing:
 - the state of the controller (PWR, RUN, ERR and STAT),
 - the inputs and outputs (IN● and OUT●).
- 8 A screw connection terminal block for connecting output actuators.
- 9 Two analog potentiometers (one for 10 and 16 input/output models).
- 10 A extension connector for the addition of a 2nd RS 232C/RS 485 serial port using the TWD NAC ●●● adapter (for 16 and 24 input/output models).
- 11 A screw connection terminal block for the connecting the \sim 100...240 V power supply unit
- 12 A connector for the TWD XCP MFK32 memory cartridge or TWD XCP RTC real-time clock (access via underside of the controller).

The compact bases can be mounted on a symmetric DIN rail, mounting plate or panel (2 holes \varnothing 4.3).

General specifications of compact base controllers

Temperature	Operating	°C	0...55 (32...131° F)
	Storage	°C	- 25...+ 70 (+ 7...+ 158° F)
Relative humidity			30 to 95 %, non-condensing
Degree of protection			IP 20
Corrosion immunity			Unaffected by corrosive gases
Altitude	Operation	m	0...2000 (0 to 6565 ft)
	Transport	m	0...3000 (0 to 9840 ft)
Vibration resistance	DIN rail	Hz	10...57, amplitude 0.075 mm, 57...150 Hz acceleration
		m/s ²	9.8 (1 G)
	Mounting on panel via TWD XMT5 mounting kit	Hz	2...25, amplitude 1.6 mm, 25...100 Hz acceleration
		m/s ²	39.2 (4 G)
Shock resistance		m/s ²	147 (15 G) 11 msec duration
RAM backup	Data		Internal relay, shift registers, counter, data register...
	Duration		Approx. 30 days (typical) at 25° C (77° F) after battery fully charged
	Battery		Lithium secondary battery
	Battery charging time		Approx. 15 hours to charge from 0% to 90%of full charge
	Battery life		5 years when charging for 9 hours and discharging for 15 hours

Specifications of compact base controllers

CPU type			TWD LCAA 10DRF	TWD LCAA 16DRF	TWD LCAA 24DRF
Number of 24 VDC inputs			6	9	14
Number of AC relay outputs			4	7	10
I/O expansions	Number of modules maxi		—		4
	Number of I/O maxi		—		88/152 (1)
Programm capacity			700 steps	2000 steps	3000 steps
Processing time	Basic instruction	msec	1 for 1000 logical steps)		
	Overhead system	msec	0.5		
Memory data	Internal bytes		128		256
	Internal words		256 (3072 maxi) (2)	512 (3072 maxi) (2)	1024 (3072 maxi) (2)
	Timer		32 (64 maxi) (2)		
	Counter		16 (32 maxi) (2)		
Power	Rated power voltage	VAC	100...240		
	Allowable voltage range	VAC	85...264		
	Max inrush current	A	35		40
	Max input current at 24 VDC	mA	250		
Max power consumption	~ 100 V	VA	20	22	33 (base with 4 I/O expansions)
	~ 264 V	VA	30	31	40 (base with 4 I/O expansions)

Communication

Function			Integrated serial link	Serial interface adaptor (optional) (3)
Type of port			RS 485	RS 232C, with TWD NAC 232D adaptor RS 485, with TWD NAC 485● adaptor
Maxi data rate		K bps	38.4	
Isolation between internal circuit and serial port			Non isolated	
Connection of programming terminal			Half-duplex terminal port	No
Communication protocol			Modbus Master/Slave RTU, ASCII character mode	
I/O "Remote Link"			Yes, see page 41006/3	

Integrated functions

Counter	Number of channels		4
	Frequency		3 channels @ 5 kHz (FCi function), 1 channel @ 20 kHz (VFCi function)
	Capacity		16 bits (0...65535 points)
Analog potentiometer	Bases 10/16/24/ I/O		1 point can be set from 0...1023 points
	Base 24 I/O		1 point can be set from 0...511 points

(1) The first value corresponds to the number of maximum I/O base on expansion with screw or wire-clamp terminal block expansion modules, the second value correspond to the HE 10 connector expansion module.

(2) The maximum values are not cumulative.

(3) With TWD LCAA 16DRF 16 I/O base and TWD LCAA 24DRF 24 I/O base.

DC input specifications				
CPU type		TWD LCAA 10DRF	TWD LCAA 16DRF	TWD LCAA 24DRF
Number of input channels		6	9	14
Rated input voltage		⎓ V	24 sink/source input signal	
Common		1		
Input limit values		⎓ V	20.4...28.8	
Input nominal current		mA	11 mA for I0.0 and I0.1; 7 mA for other inputs I0.i	
Input impedance		kΩ	2,1 kΩ for I0.0 and I0.1; 3,4 kΩ for other inputs I0.i	
Processing time	At status 1	μs	35 μs or programming filter time for I0.0...I0.5, 40 μs or programming filter time for other inputs I0.i	
	At status 0	μs	45 μs or programming filter time for I0.0...I0.5, 150 μs or programming filter time for other inputs I0.i	
Isolation		No isolation between channels, photocoupler on internal circuit		
Relay output specifications				
Number of output channels		4	7	10
Output current		A	2 per channel, 8 per common	
Common	Common 0	3 normally open		4 normally open
	Common 1	1 normally open		2 normally open
	Common 2	–		1 normally open
	Common 3	–		1 normally open
Minimum switching load		mA	0.1/0.1 VDC (reference value)	
Initial contact resistance		mΩ	30 maxi	
Rated load (resistive, inductive)		A	2A/240 VAC or 2A/30 VDC (with maxi 1800 operations /hour) : - electrical life: mini 100 000 operations, - mechanical life: mini 20 x 10 ⁶ operations.	
Isolation		~ V eff	1 500 for 1 mn	
Consumption for all the outputs	At status 1	⎓ 5 V	mA	24
		⎓ 24 V	mA	26
	At status 0	⎓ 5 V	mA	5
Real-time clock cartridge (optional) (1)				
Precision		w/month	± 30 @ 25° C	
Autonomy		days	Approx. 30 @ 25° C after full charge of the battery	
Integrated battery		No interchangeable Lithium battery		
Load time		H	about 10 for 0...90 % of the full charge	
Memory cartridge (optional) (1)				
Type of memory		EEPROM		
Memory capacity		Ko	32	
Save/transfer program and internal words		Yes		
Program size increase		No		

(1) The use of the cartridges are exclusive.



TWD LCAA 10DRF/16DRF



TWD LCAA 24DRF



TWD XCP MFK32



TWD XCP RTC



TWD NAC 232D



TWD NAC 485T



TWD XCP ODC



TWD XSM 6

References

These compact base controllers are supplied with 100...240VAC and in turn supply the voltage 24 VDC necessary to power the sensors. The digital display can be connected to the controllers via the front panel. They are equipped with:

- a slot for a 32 Kb EPROM memory cartridge or Real Time Clock cartridge.
- a slot for fitting a second RS 232C/RS 485 serial port.

The 24 input/output compact base controller can receive discrete/analog I/O expansion modules (4 modules maximum).

Compact controllers

Number of I/O	Inputs sink/source	Outputs	Program memory	Reference	Weight kg (oz)
10 I/O	6 24 VDC inputs	4 relay outputs	700 steps	TWD LCAA 10DRF	0.230 (8.0)
16 I/O	9 24 VDC inputs	7 relay outputs	2000 steps	TWD LCAA 16DRF	0.250 (8.8)
24 I/O	14 24 VDC inputs	10 relay output	3000 steps	TWD LCAA 24DRF	0.305 (10.8)

Separate parts (1)

Designation	Use	Type	Wiring	Reference	Weight kg (oz)
32 Kb memory cartridge	Application backup Program transfert	EEPROM	—	TWD XCP MFK32	—
Real-time clock cartridge	Time-stamping Real-time based programming	—	—	TWD XCP RTC	—
Serial interface adapter	Addition of a second serial port (2)	RS 232C	Mini-DIN	TWD NAC 232D	—
		RS 485	Mini-DIN	TWD NAC 485D	—
		RS 485	Screw terminal block	TWD NAC 485T	—
Operator display	Visualization and modification datas	—	—	TWD XCP ODC	—
Input simulators	Compact controllers 6 I/O	—	—	TWD XSM 6	—
	Compact controllers 9 I/O	—	—	TWD XSM 6	—
	Compact controllers 14 I/O	—	—	TWD XSM 6	—

(1) Other separate parts, see page 41006/5.

(2) With TWD 16DRF/24DRF compact controllers.

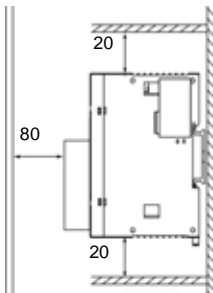
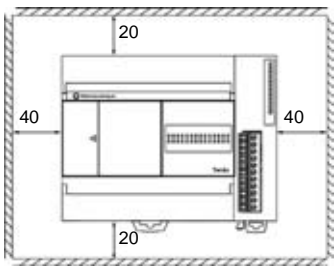
Dimensions

TWD LCAA 10DRF/16DRF/24DRF



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TWD LCAA 10 DRF	80 (3.17 in)
TWD LCAA 16 DRF	80 (3.17 in)
TWD LCAA 24 DRF	95 (3.94 in)

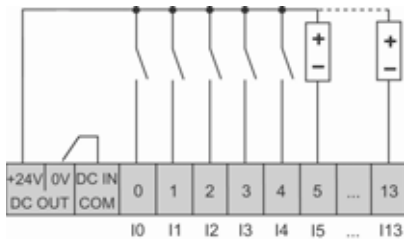
Installation rules



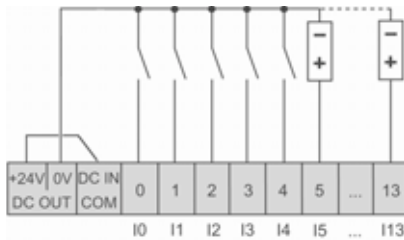
Important :
Vertical mounting: non authorized for temperatures $\geq 40^{\circ}\text{C}$, flat mounting "upside down" non authorized.
Avoid placing heat generating devices (transformers, power supplies, contactors, etc.) beneath the Twido controller.

Connections

Connections of 24 VDC inputs
TWD LCAA 10DRF/16DRF/24DRF

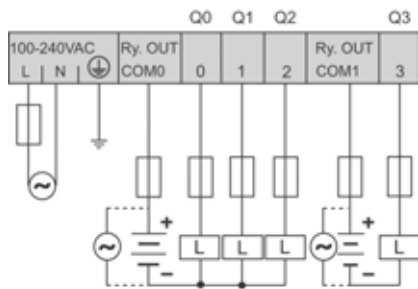


DC source input connection

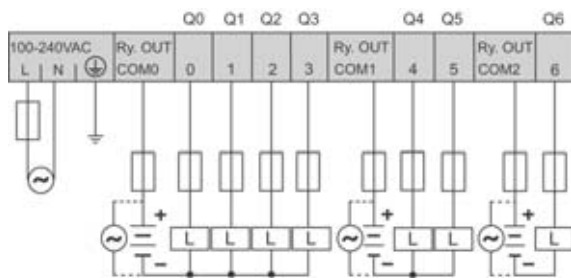


DC sink input connection

Connection of 100...240 VDC power and relay outputs
TWD LCAA 10DRF



TWD LCAA 16DRF



TWD LCAA 24DRF

