

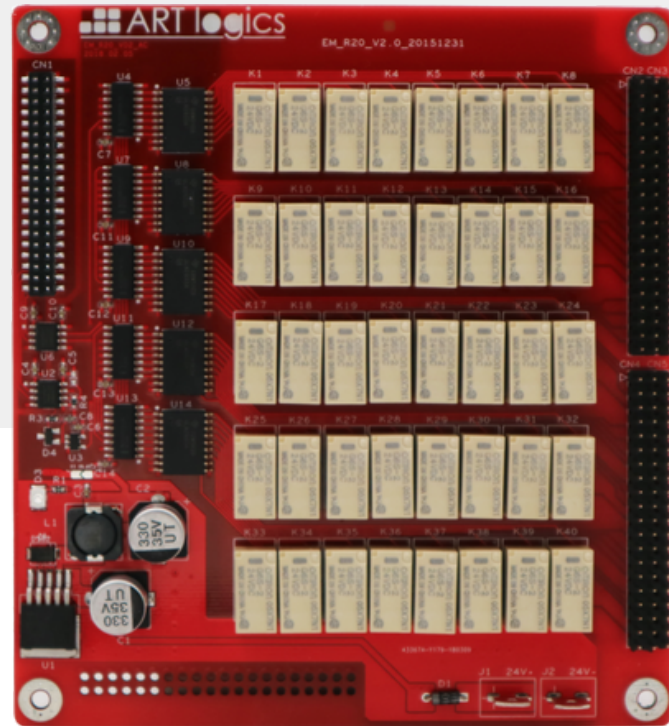
EM – R20: 40-Relay Extension Board

OVERVIEW

The EM-R20 is a plug&play board of the TCU100 extension system.

It contains 40 relays on the space of one standard extension PCB.

A relay channel provides independent Normally Opened and Normally Closed contacts. It can be used as a high side or low side switch. External serial or parallel resistor can be added to simulate contact resistance and current leakage.



KEY FEATURES

- Contact form: SPDT
- 40 Relays
- Rated load: 0.5 A at 100 VAC, 1 A at 30 VDC
- Rated carry current: 2 A
- Maximum switching voltage: 100 VDC, 70 VAC
- □Maximum switching current: 1 A
- Minimum switching current: 10 μ A at 10 mVDC
- Contact resistance: 60 m Ω maximum

LIST OF ACCESSORIES

- 8 Connectors 32 Ways DIP Type
- 4 Fastons
- 4 Plastic protections for faston connectorW
- 2 flat connectors 40 ways
- 2 CONN-FC, 2X20 pins, FEMALE, 2.54MM

DIMENSION

L*W =126mm*114mm

OPERATING TEMPERATURE

-0 °C ~ +65 °C

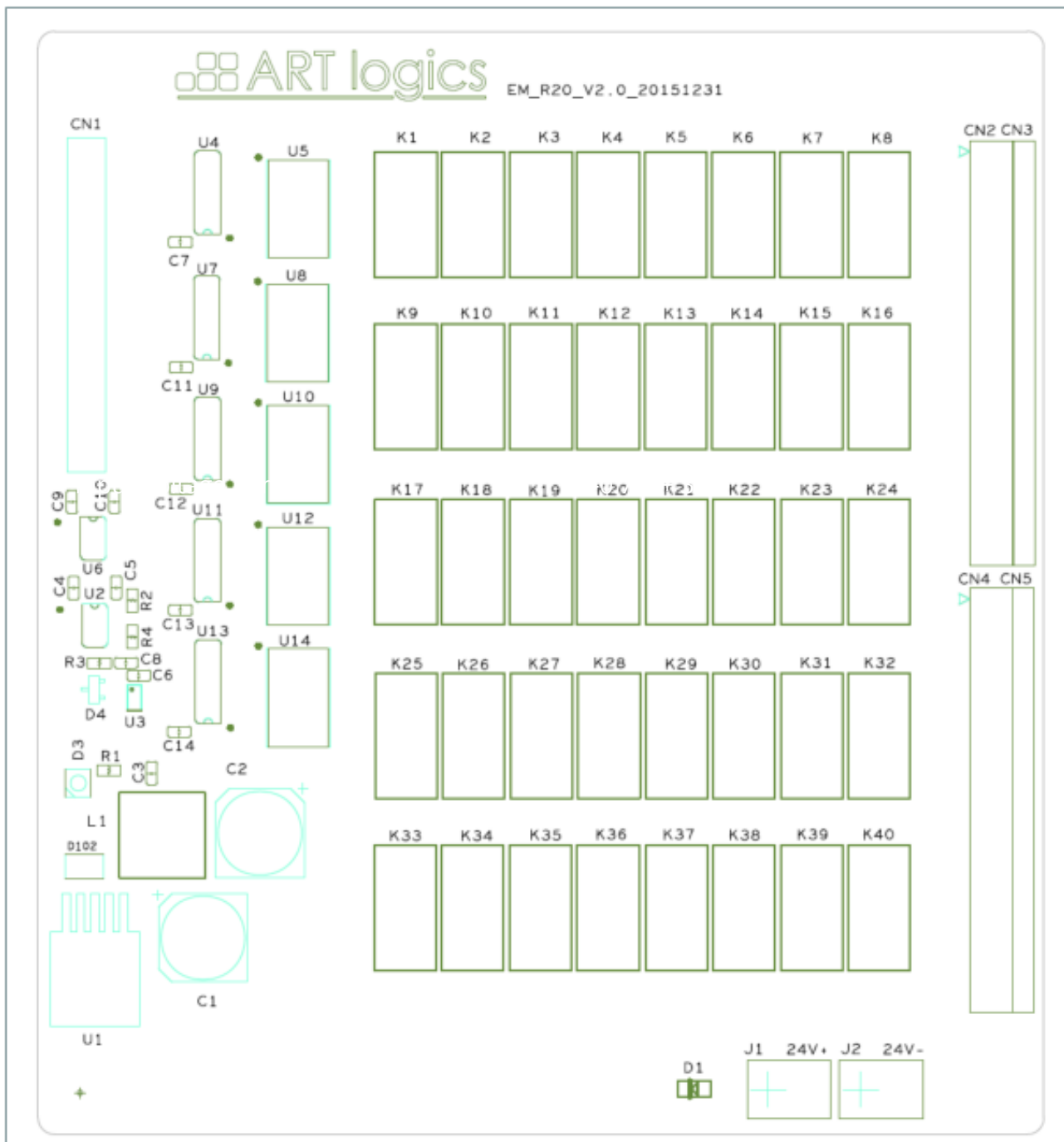
POWER REQUIREMENT

DC Power Supply:
24VDC, 90 mA

DETAILED SPECIFICATIONS:

Analog Voltage Input	Value	Unit
Input Range (Normal / Max)	100	Vdc
Current input	1	A
Contact Resistance	60	mΩ

CONNECTION:



For the topologies SPDT, a safe approach is to keep switched power below 20 Watts. Applied voltage should never exceed 100 VDC or 70 VAC, current should never exceed 1 A AC or DC.

Evaluate carefully inrush current. In a motor or lamp load circuit, an inrush current up to 15 times as large as the steady current is produced. In a circuit with a load of capacitor, inrush current can reach up to 40 times the steady current. High inrush currents may cause contact welding failure.

When switching inductive loads such as electromagnetic relays, solenoids and motors, a high back electromotive force appears between relay contacts when they break, which causes arc discharge and reduction in life of the contact.

When possible, add protection on the relay contacts when inrush current or arcing is expected.

Particularly take care when using when the relays and switching small loads, below 10 μ A or 10 mV DC.

With such loads the contact self-cleaning is reduced. A non-conductive film can appear on the contact surface, which can cause an increase in contact resistance.

The insulation resistance between opened contacts is at least 500 M Ω . (Temperature: 20 $\pm$ 15°C, Relative humidity: 65 $\pm$ 15%).

CN500	Connection to FPGA Board
J1, J2	J101: +24VDC, J102: +24VDC_GND
CN12	SPI Communication
CN13	Relay 1 to 20 Normally close (NC) and COM
CN14	Relay 1 to 20 Normally Open (NO)
CN15	Relay 21 to 40 Normally close (NC) and COM
CN16	Relay 21 to 40 Normally Open (NO)

CONNECTION TABLE

Table1 – CN2 Relay 1 to 20 NC plus COM Connection List

Pin Number	Pin Name	Pin Number	Pin Name	Pin Number	Pin Name	Pin Number	Pin Name
CN2.1	NC_RS_1	CN13.2	COM_R S_1	CN2.21	NC_RS_11	CN13.22	COM_RS_11
CN2.3	NC_RS_2	CN13.4	COM_2 RS_2	CN2.23	NC_RS_12	CN13.24	COM_RS_12
CN2.5	NC_RS_3	CN13.6	COM_R S_3	CN2.25	NC_RS_13	CN13.26	COM_RS_13
CN2.7	NC_RS_4	CN13.8	COM_R S_4	CN2.27	NC_RS_14	CN13.28	COM_RS_14
CN2.9	NC_RS_5	CN13.10	COM_R S_5	CN2.29	NC_RS_15	CN13.30	COM_RS_15
CN2.11	NC_RS_6	CN13.12	COM_R S_6	CN2.31	NC_RS_16	CN13.32	COM_RS_16
CN2.13	NC_RS_7	CN13.14	COM_R S_7	CN2.33	NC_RS_17	CN13.34	COM_RS_17
CN2.15	NC_RS_8	CN13.16	COM_R S_8	CN2.35	NC_RS_18	CN13.36	COM_RS_18
CN2.17	NC_RS_9	CN13.18	COM_R S_9	CN2.37	NC_RS_19	CN13.38	COM_RS_19
CN2.19	NC_RS_10	CN2.20	COM_R S_10	CN2.39	NC_RS_20	CN2.40	COM_RS_20

Table2 – CN3 Relay 1 to 20 NO

Pin Number	Pin Name	Pin Number	Pin Name
CN3.1	NO_RS_1	CN3.11	NO_RS_11
CN3.2	NO_RS_2	CN3.12	NO_RS_12
CN3.3	NO_RS_3	CN3.13	NO_RS_13
CN3.4	NO_RS_4	CN3.14	NO_RS_14
CN3.5	NO_RS_5	CN3.15	NO_RS_15
CN3.6	NO_RS_6	CN3.16	NO_RS_16
CN3.7	NO_RS_7	CN3.17	NO_RS_17
CN3.8	NO_RS_8	CN3.18	NO_RS_18
CN3.9	NO_RS_9	CN3.19	NO_RS_19
CN3.10	NO_RS_10	CN3.20	NO_RS_20

Table3 – CN4 Relay 21 to 40 NC plus COM Connection List

Pin Number	Pin Name	Pin Number	Pin Name	Pin Number	Pin Name	Pin Number	Pin Name
CN4.1	NC_RS_21	CN4.2	COM_R S_21	CN4.21	NC_RS_31	CN4.22	COM_RS_31
CN4.3	NC_RS_22	CN4.4	COM_R S_22	CN4.23	NC_RS_32	CN4.24	COM_RS_32
CN4.5	NC_RS_23	CN4.6	COM_R S_23	CN4.25	NC_RS_33	CN4.26	COM_RS_33
CN4.7	NC_RS_24	CN4.8	COM_R S_24	CN4.27	NC_RS_34	CN4.28	COM_RS_34
CN4.9	NC_RS_25	CN4.10	COM_R S_25	CN4.29	NC_RS_35	CN4.30	COM_RS_35
CN4.11	NC_RS_26	CN4.12	COM_R S_26	CN4.31	NC_RS_36	CN4.32	COM_RS_36
CN4.13	NC_RS_27	CN4.14	COM_R S_27	CN4.33	NC_RS_37	CN4.34	COM_RS_37
CN4.15	NC_RS_28	CN4.16	COM_R S_28	CN4.35	NC_RS_38	CN4.36	COM_RS_38
CN4.17	NC_RS_29	CN4.18	COM_R S_29	CN4.37	NC_RS_39	CN4.38	COM_RS_39
CN4.19	NC_RS_30	CN4.20	COM_R S_30	CN4.39	NC_RS_40	CN4.40	COM_RS_40

Table4 – CN5 Relay 21 to 40 NO

Pin Number	Pin Name	Pin Number	Pin Name
CN5.1	NO_RS_21	CN5.11	NO_RS_31
CN5.2	NO_RS_22	CN5.12	NO_RS_32
CN5.3	NO_RS_23	CN5.13	NO_RS_33
CN5.4	NO_RS_24	CN5.14	NO_RS_34
CN5.5	NO_RS_25	CN5.15	NO_RS_35
CN5.6	NO_RS_26	CN5.16	NO_RS_36
CN5.7	NO_RS_27	CN5.17	NO_RS_37
CN5.8	NO_RS_28	CN5.18	NO_RS_38
CN5.9	NO_RS_29	CN5.19	NO_RS_39
CN5.10	NO_RS_30	CN5.20	NO_RS_40

Table5 - Miscellaneous Connection

Pin Number	Pin Name	Pin Number	Pin Name	Pin Number	Pin Name
J1	+24_GN D	J2	+24V	CN12	FPGA Connector

USAGE EXAMPLES:

(1) For any application need a lot of Analog input and Analog output
E.g. In EPS system, when you need to generate server high accuracy and fast changing torque control voltage.

(2) For any application need to generate signal that changes with the input changes

E.g. In EPS system, when you need to generate server high accuracy and fast changing torque control voltage.

ENVIRONMENTAL

The EM - R20: Multifunction Unit is intended for indoor use only but may be used outdoors if installed in a suitable enclosure. Refer to the manual for more information about meeting these specifications.

Operating temperature

0 °C -- +65 °C

Storage temperature

-40 °C -- +85 °C

Ingress protection (IP code)

None

Operating humidity

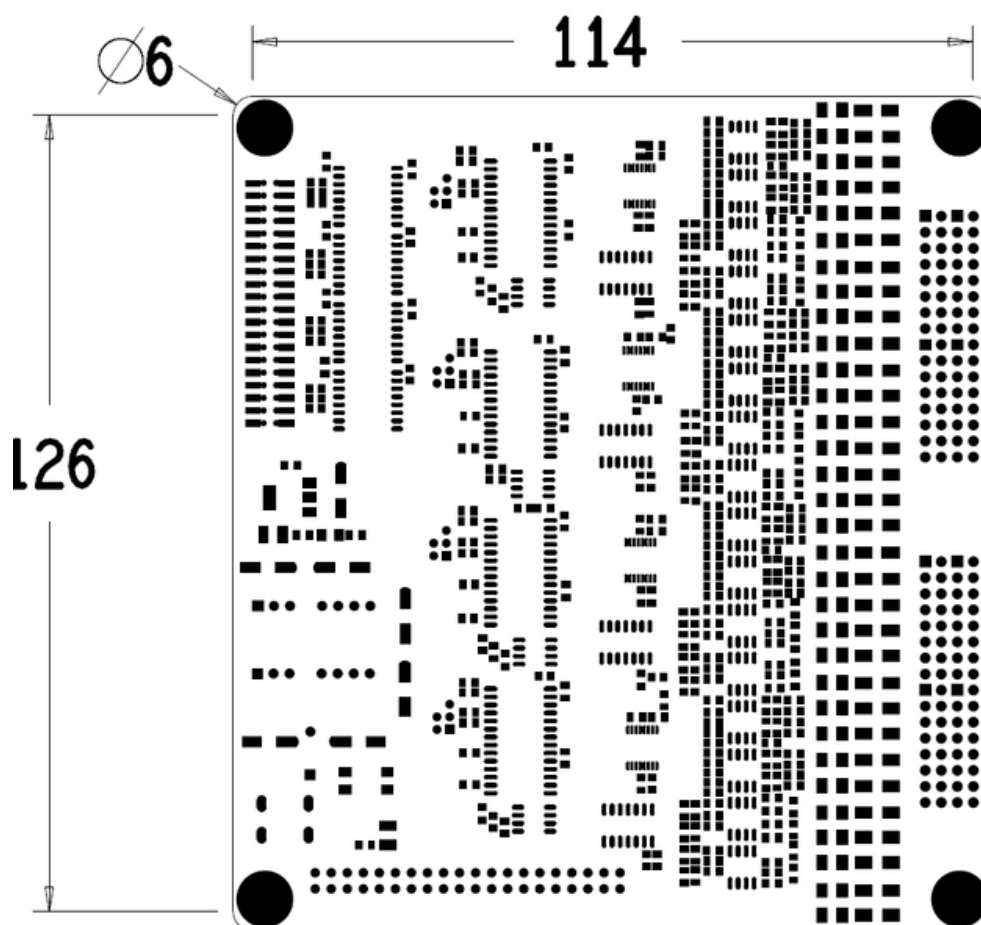
10-90% RH non condensing

Storage humidity

5-95% RH non condensing

PHYSICAL

L*W = 126mm*114mm



SUPPORT AND SERVICE

Calibration

ART logics measurement hardware is calibrated to ensure measurement accuracy and verify that the device meets its published specifications. To ensure the ongoing accuracy of the measurement hardware, ART logics offers basic or detailed recalibration service.



ART Logics (Shanghai) Testing Equipment CO., Ltd
艾驰电子检测设备技术（上海）有限公司

Tel: 021-61075469
Room 105, No. 258, Chengjiaqiao Road, Shanghai, P.R. China

www.art-logics.com
support@art-logics.com