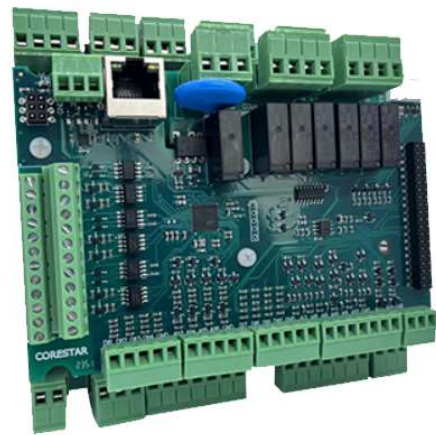


## User Manual

(Version V1.4)

# UX7

## Programmable Logic Controller



## Introduction

UX7 is a RTOS (Real Time Operating System) based programmable logic controller which can be used in many applications in the air-conditioning, heating and refrigeration sectors and solution for HVAC/R sector. Since it is programmable with good flexibility, allowing specific solutions to be created on customers request by themselves.

UX7 has three RS485 build-in communication interfaces and one CAN2.0/10M Ethernet interface, two built-in uni-polar electronic expansion valve (EEV) drivers, and supports CORESTAR's DSP series text screen and touch screen at the same time.

## Features

- Wide voltage input (24Vdc/ 24Vac)
- Flexible and configurable inputs/outputs
- Two build-in uni-polar EEV drivers
- Totally three RS485 serial ports with Modbus RTU, one CAN2.0 /10M Ethernet port
- Six build-in PWM fan/pump drivers
- two build-in SSR
- OTA supported together with external 4G/5G module
- Ethernet port supports SNMP, NTP, Modbus TCP/IP protocols

## Can be used in

- Precision air conditioning control system for computer room
- Building automation system
- Fresh air control system
- Refrigeration control system

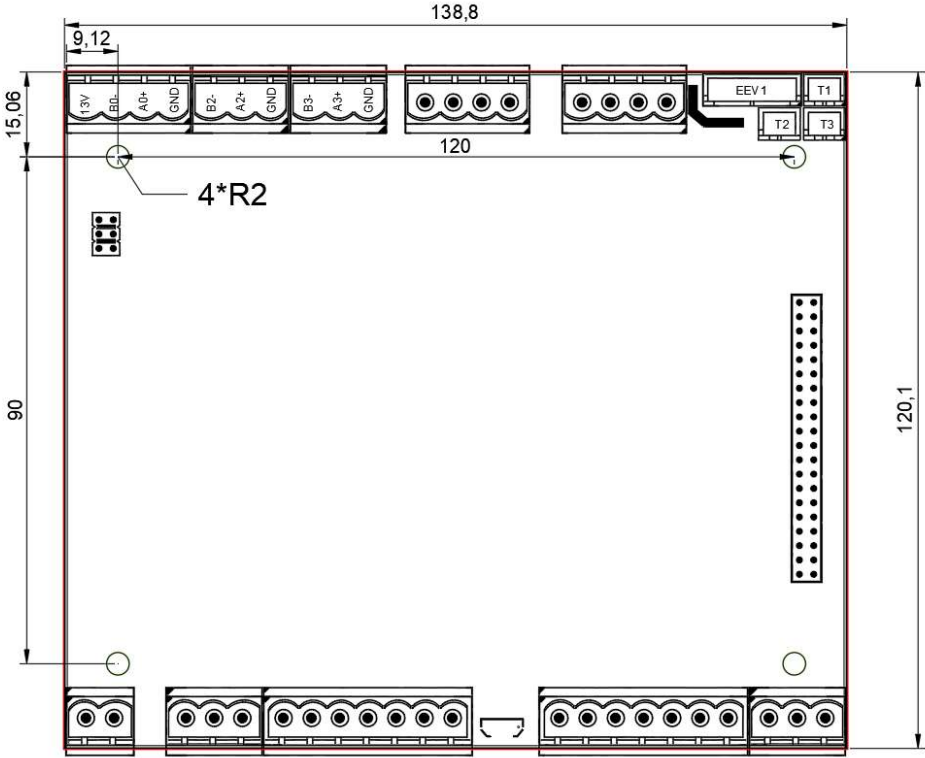
## ABSOLUTE MAXIMUM RATINGS:

- NOTE: Stresses above/below these ratings may cause permanent damage.

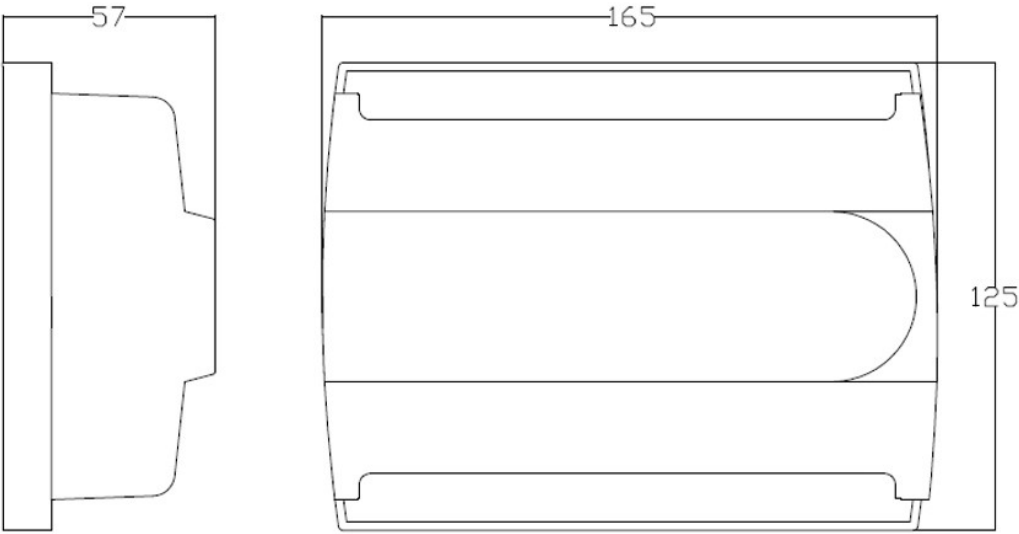
Table 1

parameter	minimum	maximum	unit
Storage temperature	-40	85	°C
Operating temperature	-40	60	°C
DC working voltage	18	35	Vdc
AC working voltage	13	30	Vac
Display cable length	0.1	10	m
Serial communication length (AWG24 shielded cable)	0	500	m
+VDC output current	0	100	mA
+5Vdc output current	0	80	mA

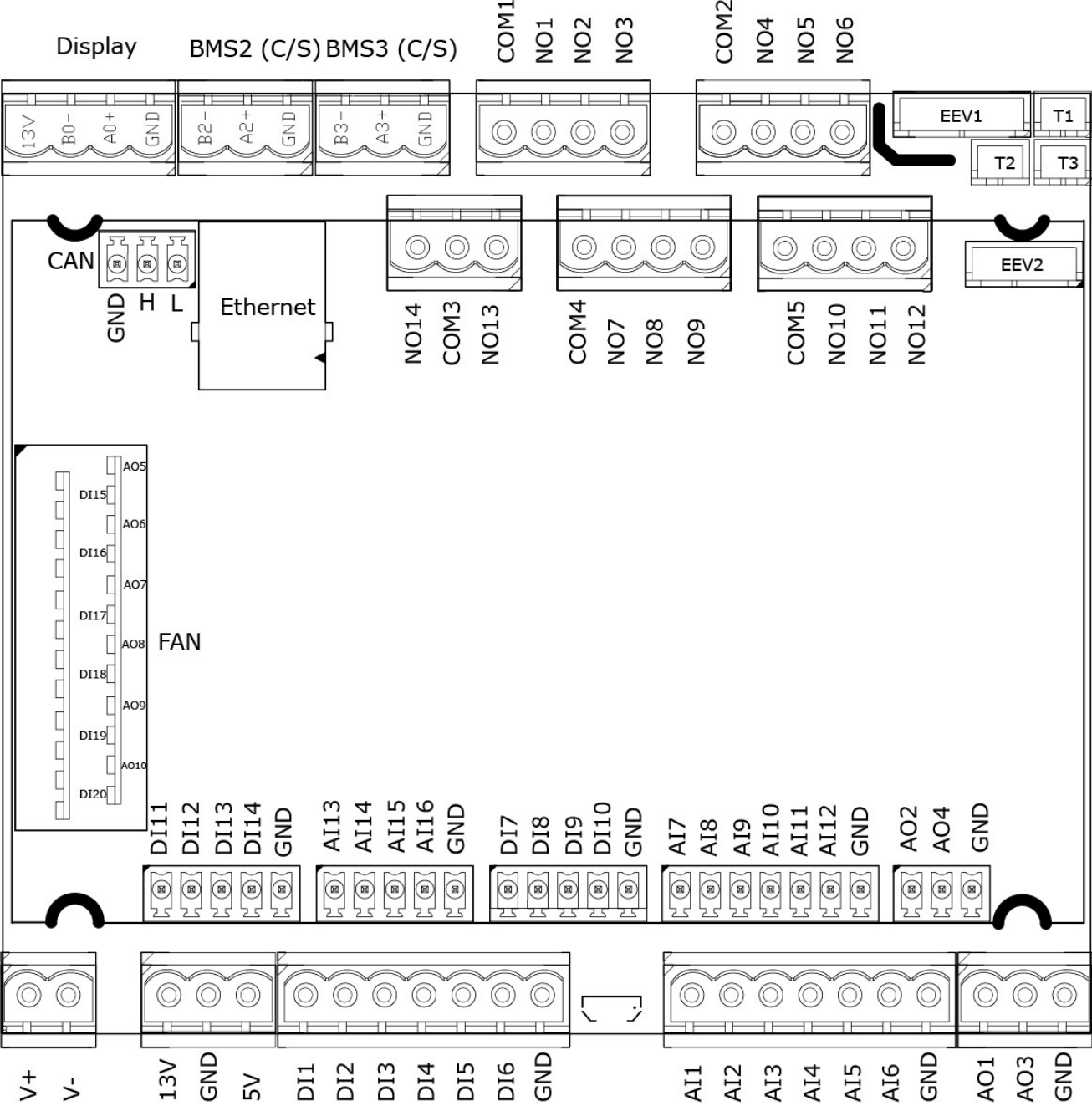
### Dimensions without plastic cover(unit mm)



### Dimensions with plastic cover (unit mm)



## Inputs/Outputs



**NOTE: FAN interface only available in NO plastic version**

## Analogue inputs

Table 2

Channel number	16
Type	
AI 1	NTC (-50 ~ 90°C; R/T 10 kΩ ±1% @25°C), NTC HT (0~150°C)
	Digital input type: free contact
	0~10V from probes powered by controller
	PT1000
AI 2, AI 3, AI 4	NTC (-50 ~ 90°C; R/T 10 kΩ ±1% @25°C), NTC HT(0~150°C)
	Digital input type: free contact
	0~5V from probes powered by controller
	PT1000
AI 5, AI 10	NTC (-50~90°C; R/T 10 kΩ ±1% @25°C), NTC HT(0~150°C)
	0~20 mA /4~20 mA from probes powered by controller
	PT1000
AI 6, AI 7, AI 8, AI 9, AI 12	NTC (-50~90°C; R/T 10 kΩ ±1% @ 25°C), NTC HT(0~150°C)
	0~5V from probes powered by controller
	PT1000
AI11	NTC (-50~90°C; R/T 10 kΩ ±1% @ 25°C), NT CHT(0~150°C)
	0~10V from probes powered by controller
	PT1000
AI 13,AI 14, AI 15, AI 16	NTC (-50~90°C; R/T 10 kΩ ±1% @25°C), NTC HT(0~150°C)
	0~20 mA /4~20 mA from probes powered by controller
	PT1000
Time constant	0.5 s
precision	1%fs

## Digital inputs

Table 3

Channel number	14+4 (A1,A2,A3,A4) + 6 (PWM FAN/PUMP port)
Type	
DI1,DI2	Free contacts
	Fast digital inputs (max 500Hz)
DI3.....DI14	Free contacts
DI15.....DI20	Inputs with voltage (Min. : 10Vdc, Max. 30Vdc) <b>(only available in NO plastic cover version)</b>
Time constant	0.5 s

## Analogue outputs

Table 4

Channel number	4+6 (PWM output)	
Type		
AO1	0~10VDC	
AO2	0~10VDC	
AO3	0~10VDC	
	PWM 0/10 V 100 Hz	
	PWM 0/10 V 2KHz	
AO4	0~10VDC	
	PWM 0/10 V 100 Hz	
	PWM 0/10 V 2KHz	
AO5...AO10	Isolated PWM output for PWM fan/pump	
Max current	AO1...AO4: 2mA, AO5...AO10: 10mA	
precision	±3%	

## Digital outputs

Table 5

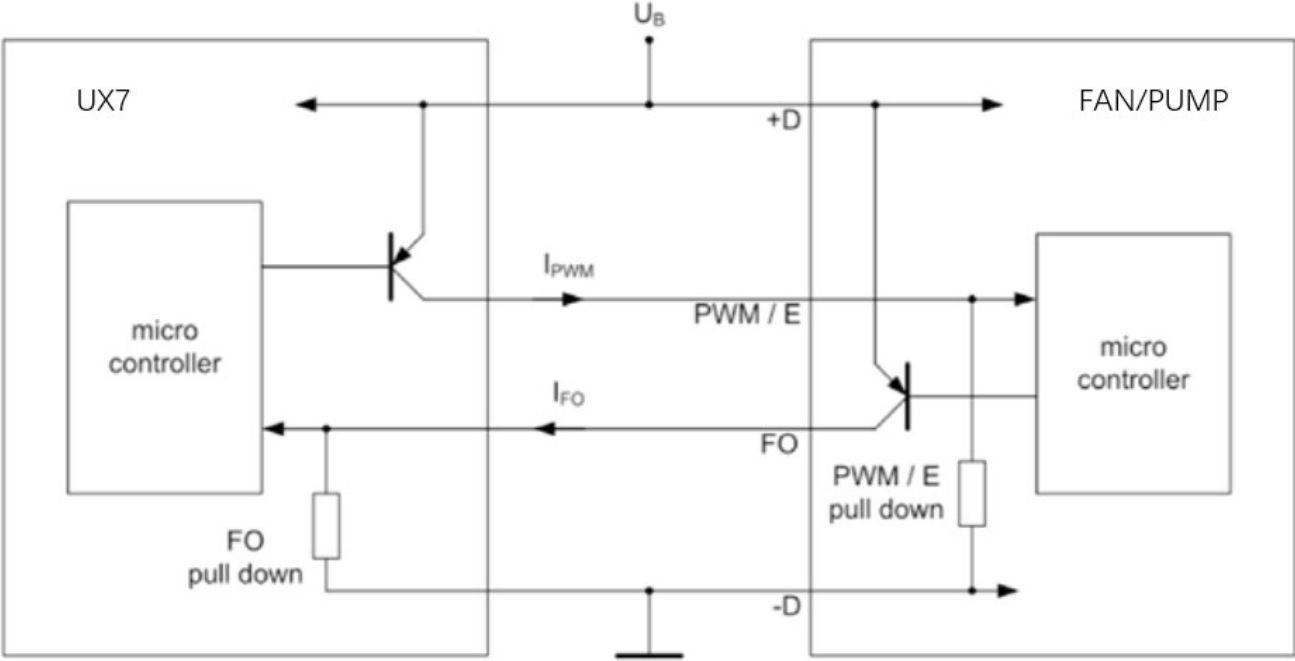
Channel number	12 (Relay) +2 (SSR)	
Type		
SPST	NO1.....NO5, NO7.....NO13	AC 250V 5A (resistive load)
SSR	NO6,NO14	AC load only: max. 1.0A
Electrical durability	NO1.....NO5, NO7.....NO13: 100K cycles, NO6,NO14 no limit	
Mechanical durability	NO1.....NO5, NO7.....NO13: 1000K cycles, NO6,NO14 no limit	
Certifications	VDE,UL,CQC	

## Uni-polar EEV drivers

Table 6

Number	2
Max. power of each valve	8W (depending on valve type)
Voltage	12Vdc
Type of motor	Single-pole stepper motor
Port definition	

**PWM fan/pump control port(only available in NO plastic cover version)**

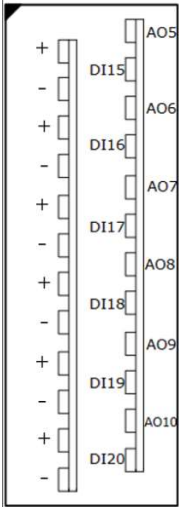


+D: power input V+, -D: power input V-, PWM/E: signal for speed control, FO: feedback signal

Table 7

Channel number	6
Power input(UB)	24Vdc +/-3Vdc
PWM/E frequency	100~1K Hz
PWM/E current	5mA +/-10%
FO max. current	50mA

**PWM FAN/PUMP port definition**



AOx	PWE/E of fan/pump
DIxx	FO of fan/pump
+	UB(D+) of fan/pump
-	UB(D-) of fan/pump

## Current measurement inputs

Number	3
frequency	50/60Hz
Max. input current	25mA
Resolution	10bit
Precision	$\pm 5\%$

Note:

1. For current monitoring, max support 50A, has to use special sensor of CORESTAR order code: ESR60

## Application upgrade guideline

Final user can upgrade application easily by micro-USB port on UX\* board

Hardware resources:

1. one computer with USB port
2. Micro-USB cable (Android phone DATA cable)
3. The latest application file (the name must be APP.ZIP and cannot be modified)

Upgrade steps:

Step 1: Connect cable to micro-USB port on UX\* board

Step 2: Connect the cable to the computer USB port, after 2~5 seconds, the USB disk icon will appear

Step 3: Double-click to open the USB disk, you can see 2 folders (UPGRADE and SYSTEM)

Step 4: Double click UPGRADE folder to enter

Step 5: Copy the APP.ZIP file to the UPGRADE folder and make sure the copy is complete

Step 6: Unplug the USB cable, power off and restart (when restarting, you will see the red and green lights flash alternately, after the upgrade is complete, only the green light will work in normal operation)

Step 7: upgrade complete

Micro USB

