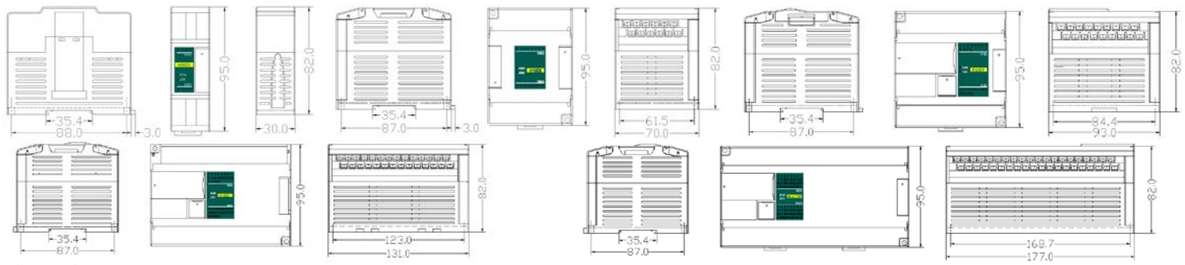
DI/O 模块使用说明书

一、 产品型号列表

型号	额定功率	外形尺寸	型号	额定功率	外形尺寸	型号	额定功率	外形尺寸
AN24DI	0.6 VA	93×95×82mm	AN16DI	0.6 VA	70×95×82mm	AN40DI	0.8 VA	131×95×82mm
AN12DIR	3　VA		AN16DR	3.7 VA		AN36DR	7.5 VA	
AN12DIT(P)	2.1 VA		AN16DT(P)	2.5 VA		AN36DT(P)	4.7 VA	
AN32DIR	7　VA	177×95×82mm	AN8DIR	2　VA		AN20DIR	3.5 VA	
AN32DIT(P)	4.7 VA		AN8DIT(P)	1.6 VA		AN20DIT(P)	3.1 VA	
AN24DI-e	0.6 VA	93×95×82mm	AN32DIR-e	7　VA	177×95×82mm	AN40DI-e	0.8 VA	131×95×82mm
AN12DIR-e	3. VA		AN32DIT(P)-e	4.7 VA		AN36DR-e	7.5 VA	
AN12DIT(P)-e	2.1 VA					AN36DT(P)-e	4.7 VA	
			AN20DIT(P)-e	3.1 VA	131×95×82mm	AN20DIR-e	3.5 VA	



二、指示灯说明

1、POW：电源指示灯，绿色。常亮 - 电源正常；不亮 - 电源异常。

2、LINK：通讯指示灯。根据错误的严重程度分 4 种颜色指示，从正常到严重为：绿色，黄色闪，红色闪烁，红色常亮。

用户需根据指示灯的不同状态做出相应的处理，详见下表：

LINK 指示灯状态		指示信息分类	参考处理方式
绿色	常暗	未识别模块且无通信	正常
	常亮	已识别模块且无通信	
	快速抖动	串口、并口通信	
黄色	亮暗闪烁	无并/串口通信	缺少外供电源
	暗和抖动交替	有并/串口通信	
红色	亮暗闪烁	无并/串口通信	固件不完整
	暗和抖动交替	有并/串口通信	
	常亮	无并/串口通信	返厂维修
	快速抖动	有并/串口通信	
注：	抖动	闪烁	交替
	指示灯亮 30ms 灭 30ms。	指示灯亮 0.5s 灭 0.5s。	指示灯灭 0.5s 抖动 0.5s。

三、电源规格

项目	DC 直流电源
输入电压	DC24V　-15%~+20%
电源频率	——
电源功耗	——
瞬间电涌	MAX 20A 1.5ms @24VDC
允许瞬间断电时间	10ms 以内
电源保险丝	2A，250VAC
5V 输出(CPU 用)	5V,-2%~+2%,1.2A(最大)
24V 输出(输入及外设用)	无
隔离方式	无电气隔离
电源保护	直流输入电源极性反接、过压保护

四、产品环境规格

项目	环境规格
温度/湿度	工作温度：0~+55 ℃　储存温度：-25~+70 ℃　湿度：5~95%RH，无凝露
抗振动能力	10~57Hz 振幅 0.075mm，57Hz~150Hz 加速度 1G，X、Y、Z 三轴方向各 10 次
抗冲击能力	15G，持续 11ms，X、Y、Z 三轴方向各 6 次
抗干扰能力	DC EFT：±2500V，浪涌：±1000V
耐压能力	AC 端子对地线端子间 1500VAC，1 分钟　DC 端子对地线端子间 500VAC，1 分钟
绝缘阻抗	AC 端子对地线端子间 500VDC，5MΩ 以上(所有输入/输出点对地间 500VDC)
使用环境	防尘、防潮、防腐蚀、免受电击及外力冲击等环境

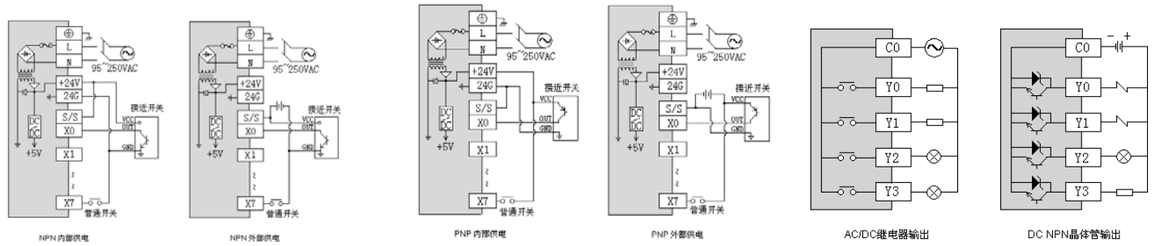
五、开关量输入（DI）规格

项目	开关量输入 DI
输入信号	无电压接点或 NPN/PNP
动作驱动	ON：3.5mA(16V)以上　OFF：1.5 mA (6V)以下
输入阻抗	约 4.3KΩ
输入最大电流/电压	10mA/35V
响应时间	默认 6.4ms，可配置为 0.8~51.2ms
隔离方式	每通道单独光电隔离
输入指示	LED 灯亮表示 ON，不亮表示 OFF
电源输入	模块主机内部供电：直流电源（SINK 或 SOURCE）5.3mA@24VDC

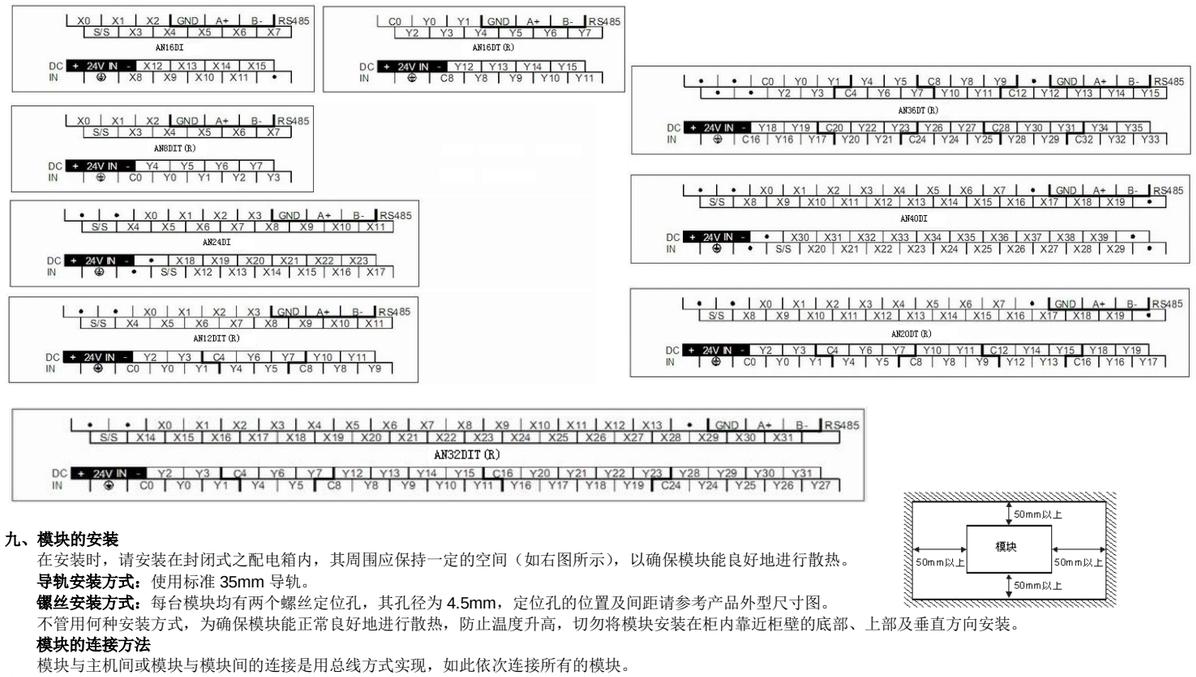
六、开关量输出（DO）规格

项目		继电器输出-R	晶体管输出-T (NPN /PNP)
最大负载	电阻性负载	2A/1 点，8A/4 点共 COM	0.5A/1 点，2A/4 点共 COM
	电感性负载	50VA	5W/DC24V
	灯负载	100W	12W/DC24V
最小负载		10mA	2mA
电压规格		250VAC,30VDC 以下	30VDC
驱动能力		最大触点容量：5A/250VAC	MAX 1A　10 秒
响应时间		Off-on 10ms，On-off 5ms	Off→On 10us，On→Off 120us
隔离方式		机械隔离	每通道单独光电隔离
输出指示		LED 灯亮表示 ON，不亮表示 OFF	
电源输入		模块主机内部供电 24VDC	

七、开关量输入/出 (DI/ DO)的接线图



八、端子配线图



九、模块的安装

在安装时，请安装在封闭式之配电箱内，其周围应保持一定的空间（如右图所示），以确保模块能良好地进行散热。

导轨安装方式：使用标准 35mm 导轨。

螺丝安装方式：每台模块均有两个螺丝定位孔，其孔径为 4.5mm，定位孔的位置及间距请参考产品外型尺寸图。

不管用何种安装方式，为确保模块能正常良好地进行散热，防止温度升高，切勿将模块安装在柜内靠近柜壁的底部、上部及垂直方向安装。

模块的连接方法

模块与主机间或模块与模块间的连接是用总线方式实现，如此依次连接所有的模块。

十、通讯地址的设定

方法一：通过模块上的编码开关修改。右图为用于设定模块地址的 4 位编码开关示意图，上面为 ON，下面为 OFF，图中黑色部分表示编码开关的位置，拨到 ON 时表示该位为 1，拨到 OFF 时表示该位为 0，反映到模块地址时用二进制表示：第 1 位表示二进制的第 1 位（b0），第 4 位表示二进制的第 4 位（b3），由此，4 位编码开关可用于表示二进制的数从 0000 ~ 1111，把二进制数转化为十进制数后即为模块地址。

方法二：通过编程软件的界面修改。

- 以太网模块出厂默认 IP 地址：192.168.1.111

十一、供电电源的接线

本手册所适用机型的供电电源由主机直接供电，或由外部供电。模块主机的供电电源的接线方法请查看模块的相关资料。

当主机交流电源停电时间低于 20ms 时，模块不受影响继续运行，当停电时间过长或电源电压下降将使模块停止运行，输出全部为 OFF，当电源恢复正常时，模块将自动回复运行。

注：自动控制系统设计时要考虑的几点建议：

1、交流电源供电时其回路保护用保险丝以 3A 为好；

2、供电电源进入模块前请使用可同时切断两根电源线的设备（如空开等）；

3、有系统紧急停止按扭：为预防突发状况发生，设置一紧急停止按钮，可在状况发生时，切断系统电源；

4、系统控制回路隔离装置：使用电磁接触器、继电器等开关作为系统电源回路隔离装置，可防止电源断续供应时，造成系统的不稳定；

5、接地阻抗 100Ω 以下；

十二、开关量模块参数表（注：CR 号就是对应的 Modbus 寄存器地址）

CR 号通讯地址	功能说明	属性	出厂值	备注
00	低字节为模块代码，高字节为模块版本号	R		
01	通讯地址	R/W	1	范围：1~254
02	通讯协议：低字节低 4 位：　0 - N,8, 2 FR RTU　1 - E,8, 1 FR RTU　2 – O,8, ,1 FR RTU 3 - N,7, 2 FR ASCII　4 - E,7, 1 FR ASCII　5 - O,7, 1 FR ASCII　6 - N,8, 1 FR RTU 低字节高 4 位：0 – 2400　1 – 4800　2 – 9600　3 – 19200　4 – 38400　5 – 57600　6 - 115200	R/W	48 (19200,N,8, 2　RTU)	
03~08	模块名称	R/W		
9~14	出厂信息	R		
15	错误代码 0:正常 1:非法固件身份 2:固件不完整 3:系统数据访问异常　4:无外部电源	R	0	
16~79	DI 通道 1~64 的输入值	R		预留最大输入通道 64
80~143	DO 通道 1~64 的输出值	R/W		预留最大输出通道 64
144	DI 的滤波时间 ms：0 - 0.8　1 - 1.6　2 - 3.2　3 - 6.4 4 - 12.8　5 - 25.6　6 - 51.2	R/W	3	默认 6.4 ms
145~158	保留	R		

感谢您选用 Anice 模块，若您对我们的产品或服务有问题或不足之处，敬请告诉我们！

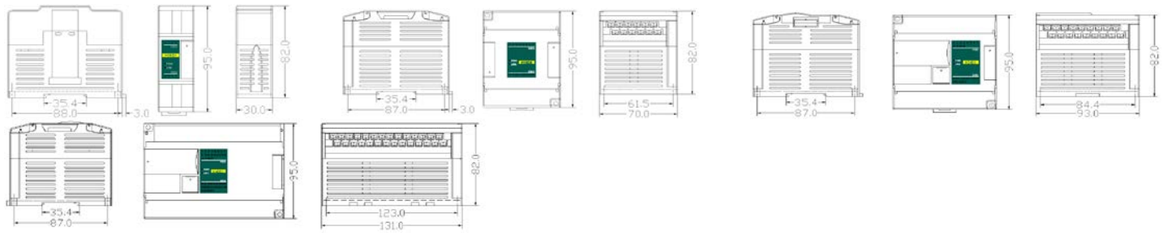
网址：http://www.anicetech.com

Anice安耐电子

User's Manual of DI/O Module

1.Product Model List

Model	Power Consumption	Dimension	Model	Power Consumption	Dimension	Model	Power Consumption	Dimension
AN24DI	0.6 VA	93×95×82mm	AN16DI	0.6 VA	70×95×82mm	AN40DI	0.8 VA	131×95×82 mm
AN12DIR	3 VA		AN16DR	3.7 VA		AN36DR	7.5 VA	
AN12DIT(P)	2.1 VA		AN16DT(P)	2.5 VA		AN36DT(P)	4.7 VA	
AN32DIR	7 VA	177×95×82mm	AN8DIR	2 VA		AN20DIR	3.5 VA	
AN32DIT(P)	4.7 VA		AN8DIT(P)	1.6 VA		AN20DIT(P)	3.1 VA	
AN24DI-e	0.6 VA	93×95×82mm	AN32DIR-e	7 VA	177×95×82mm	AN40DI-e	0.8 VA	131×95×82 mm
AN12DIR-e	3. VA		AN32DIT(P)-e	4.7 VA		AN36DR-e	7.5 VA	
AN12DIT(P)-e	2.1 VA					AN36DT(P)-e	4.7 VA	
			AN20DIT(P)-e	3.1 VA	131×95×82mm	AN20DIR-e	3.5 VA	



2.Indicator Description

① POW: Power indicator, green. Continuous ON - Power good; OFF - Power error.

② LINK: Communication indicator. According to the severity of the error indication in 4 colors: Green, Yellow Flash, Flashing Red, Red from normal to severely. According to the different states of the indicator, users are recommended to take the following actions:

State of the LINK Indicator		Indication Information	Actions to Take
Green	Keep dark	Host is not recognition module and no communication	Nothing
	Keep light	Host identified modules and no communication	
	Quick jitter	Serial, parallel communication	
Yellow	Flashing light and dark	No parallel / serial communication	Lack of external power supply
	Alternating dark and jitter	Parallel / serial communication	
Red	Flashing light and dark	No parallel / serial communication	Firmware incomplete
	Alternating dark and jitter	Parallel / serial communication	
	Keep light	No parallel / serial communication	Returned for repair
	Quick jitter	Parallel / serial communication	
Note:	Jitter	Flicker	Alternately
	30 second's on with 30 second's off	0.5 second's on with 0.5 second's off	0.5 second's off with 0.5 second's jitter

3.Power Supply Specification

Item	DC Power Supply
Power Supply Voltage	DC24V -15%~+20%
Power Supply Frequency	——
Power Consumption	——
Instantaneous Surge	20A 1.5ms MAX @24VDC
Power Loss Time	10ms R less
Fuse	2A, 250VAC
5V Output Voltage (for CPU)	5V, -2%~+2%, 1.2A MAX
24V Output Voltage (for input and peripheral)	No
Insulation Type	No Electrical isolation
Power Protection	DC input power polarity reverse, over voltage

4.Environmental specifications for Product

Item	Environment Specification
Temperature/Humidity	Operating temperature:0~+55℃ Storage temperature:-25~+70℃ Humidity: 5~95%RH, No condensation
Vibration Resistance	10~57 HZ, amplitude=0.075mm, 57HZ~150HZ acceleration=1G, 10 times each for X-axis, Y-axis and Z-axis
Impact Resistance	15G, duration=11ms, 6 times each fR X-axis, Y-axis and Z-axis
Interference Immunity	DC EFT:±2500V Surge:±1000V
Over Voltage Resistance	1500VAC/1min between AC terminal and PE terminal, 500VAC/1min between DC terminal and PE terminal
Insulation Impedance	≧5MΩbetween AC terminal and all input/output points to PE terminal @500VDC
Operating environment	Avoid dust, moisture, corrosion, electric shock and external shocks

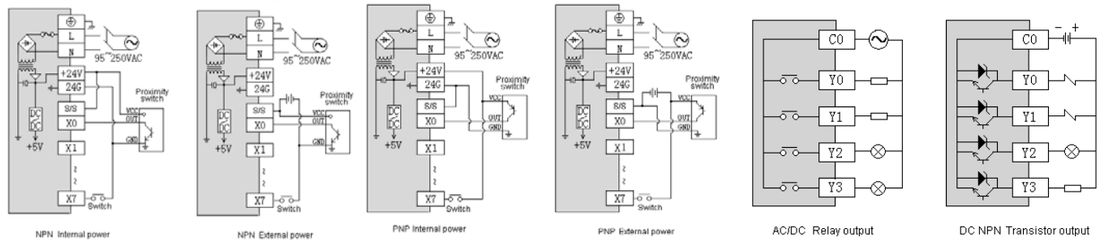
5.Digital Input (DI)Specification

Item	Digital Input (DI)
Input Signal	No voltage contact R NPN/PNP
Action driving	ON>3.5mA OFF<1.5mA
Input Impedance	Input Impedance≈4.3KΩ
Maximum Input Current	10mA
Reaction Time	6.4ms DEFAULT, can be configured to 0.8~51.2ms
Insulation Type	Optoelectronic isolation for each channel
Input Indication	LED's lighting indicates ON, no light indicates OFF
Power supply	MPU internal power supply:DC power supply (SINK R SOURCE) 5.3mA@24VDC

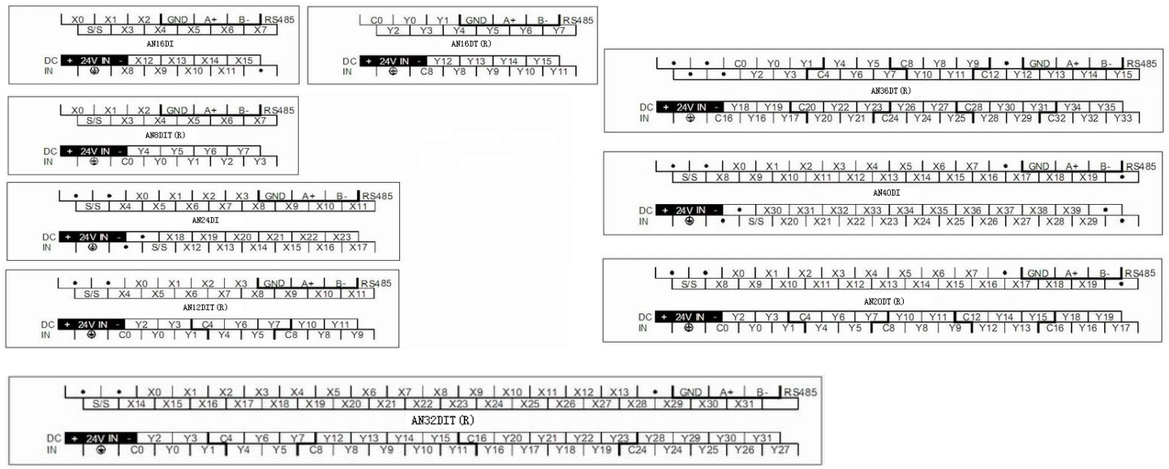
6.Digital Output (DO) Specification

Item		Output point type : Relay - R	Output point type :Transistor - T
Maximum load	Resistive Load	2A/1 point, 8A/4 points COM	0.5A/1 point, 2A/4 points COM
	Inductive Load	50VA	5W/DC24V
	Lamp load	100W	12W/DC24V
Minimum Load		10mA	2mA
Voltage Specification		Below 250VAC, 30VDC	30VDC
Drive Capability		Maximum contact capacity: 5A/250VAC	1A MAX, 10 seconds
Reaction Time		Off→On 10ms, On→off 5ms	Off→On 10us, On→Off 120us
Insulation Type		Mechanical isolation	Optoelectronic isolation for each channel
Output Indication		LED's lighting indicates ON, no light indicates OFF	
Power Supply		MPU internal 24VDC power supply	

7.Digital Input/Output (DI/DO) Wiring



8.Pin assignment for the Modules



9.Mounting and installation

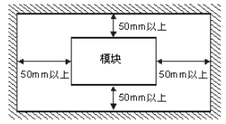
The Module should be secured to an enclosed cabinet while mounting. For heat dissipation, make sure toprovide a minimum clearance of 50mm between the unit and all sides of the cabinet. (See the figure.)

Rail Mounting: Use standard 35 mm rail.

Screw Mounting: Each module has two positioning screw holes, the diameter of the hole is 4.5mm. Please refer to the dimension figure for the location of the positioning holes and their spacing.

To avoid over temperature and for a better heat dissipation, do not mount Module to a position near to the bottom/top of the cabinet. Do not mount Module in vertical direction.

Module Wiring: Connections between modules and connections between module are achieved through RS485 bus.



10.Correspondence Address Setting

Method 1: modify address by code switch. The 4-bit code switch is used to set Module's address, as shown in the figure on the right side. The black rectangle indicates the position of each code switch. When the switch was toggled to ON, the bit was set to 1, bit will be set to 0 when the corresponding switch was toggled to OFF.

The 4-bit code switch's state indicates Module's address by the following rule: the "1" switch represents the first bit (b0), the "4" switch represents the fourth bit (b3). Therefore the 4-bit code switch is able to represents binary number range from 0000 to 1111, Module's address will be the decimal number converted from the binary number set by the code switch.

Method 2: modify address through programming software interface. Select "Module" option in the menu bar, then select "Setup Module Parameters" option from the follow-up options, checked

* TCP module defuse IP address：192.168.1.111

11.Power Supply Wiring

Power supply of this manual applies models are powered directly by the host or by an external power supply. Power supply wiring method of Module host, check the the relevant information of Module.

When the host AC power outage time is less than 20 ms, Module continues to run unaffected. When power outage time is too long or the power supply voltage drop will make Module stops running, all output is OFF. When the power supply back to normal, the Module will run automatically reply.

Note: The automatic control system design should consider some suggestions:

1、When the AC power supply, fuse of circuit protection with 3A is better.

2、Power supply into the Module before please use the power cord can be cut off two devices at the same time (e.g., air switch, etc.).

3、Systematic emergency stop button: Seting up an emergency stop button can cut off the power supply system in the condition occurs in order to prevent an emergency happen.

4、System control circuit isolation device: Using the electromagnetic contactor, relay etc as power supply circuit isolation device of the system，which can prevent the power supply when the intermittent supply cause system instability.

5、Grounding impedance under 100 Ω.

12.Switch module parameter table（Note: CR number is corresponding to the Modbus register address）

CR Number Mailing address	Function Description	Property	Factory Value	Remark
00	Low byte is the module code,High byte is the module version number	R		
01	Communication Address	R/W	1	Range：1~254
02	Communication protocol:Low 4 bit of low byte 0 - N,8, 2 FR RTU 1 - E,8, 1 FR RTU 2 - O,8, 1 FR RTU 3 - N,7, 2 FR ASCII 4 - E,7, 1 FR ASCII 5 - O,7, 1 FR ASCII 6 - N,8, 1 FR RTU High 4 bit of low byte:0 – 2400 1 – 4800 2 – 9600 3 – 19200 4 – 38400 5 – 57600 6 - 115200	R/W	48(19200, N,8,2 RTU)	
03~08	Module Name	R/W		
9~14	Factory Information	R		
15	Error Codes :0: Normal 1: Illegally firmware status 2: Firmware incomplete 3: System data access exception 4: No external power supply	R	0	
16~79	The input value of DI channel 1 ~ 64	R		Reserve maximum input channel 64
80~143	The output value of DO channel 1 ~ 64	R/W		Reserve maximum input channel 64
144	Filter time of DI /ms：0 - 0.8 1 - 1.6 2 - 3.2 3 - 6.4 4 - 12.8 5 - 25.6 6 - 51.2	R/W	3	Default 6.4 ms
145~158	Retention	R		

Thanks for choosing Anice's module, If you have any questions about our products or services, please let us know!

Anice website: http://www.anicetech.com

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