

SMART SYSTEM



Self-developed Linux system, which has great extensibility.

High security performance, such as login authentication, multi-VPNs.

Clear and friendly GUI, easy for any engineer to use device.





FLEXIBLE LINKS

Navigate	Worx					Login: admin Reboot	Logout
Overview	Status	. <u>Con</u>	nection				
Link Management	General	Settings					
 Connection Manager Cellular Ethernet WiFi Industrial Interface Network 	Priority 1 2 3 4	Enable true true true true	Connection Type WWAN1 WWAN2 WAN WLAN	Description			9 8 9 9 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
ndustrial Interface Intervork	1						

Cellular:

Specify SIM1 carrier as WWAN1 link, SIM2 carrier as WWAN2. **WAN:** PPPOE, DHCP Client, Static IP **WiFi:** Supports WiFi AP and WiFi Client **Link Failover:**

Supports Ethernet WAN, Cellular WAN and WiFi failover



IPv6 Supported

- > With the development of the IOT, IPv4 is not enough for the things. IPv6 will be the trend in the future.
- Navigateworx router support well with both IPv4 and IPv6.
- Configuration via WebGUI

General Accounts Syslog Web Server Telnet SSH Security General Settings Hostname padatework.router Enable IPvis Image: Settings Time Zone VIC=06:00 Customized Time Zone © Time Synchronisation Enable Enable ©	General Accounts Syslog Web Server Telnet SSH Security General Settings Hodrame nervatewon.couter Enable IPv5 ✓ User LED Type None Time Zone Settings UTC+08:00 Customized Time Zone ✓ Time Synchronisation Enable	General Accounts Syslog Web Server Telnet SSH Security General Settings Hostname notspervorx.router Enable Dvs Image: Construction of the second sec	General Accounts Syslog Web Server Telnet SSH Security General Settings Hodname nexspectors.router Enable Dvis Image Settings Time Zone Settings Viscre Time Zone Settings Uiscrease Time Zone Settings Image Settings Time Zone Settings Image Settings Time Synchronisation Enable Primary NTP Server podutp.org	Worx							Login: admin	Logout
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							Enable	d)	16			
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Secondary with Server						Seco	idary NTP Server	1.pool.ntp.org				
							many first wears	Lot				
Save	Save											

A Distance in the second second				Login: admin	
Navigate	worx			Reboot	Logout
Overview	Status				
Overview	System Information				
Syslog		Device Model	NR500-54G		
nk Management		System Uptime	1 day, 22:24:35		
dustrial Interface		System Time	2019-10-18 15:39:53		
etwork		RAM Usage	17M Free/20M Shared/64M Total		
plications		Firmware Version	1.1.1 (8121a55)		
PN		Kernel Version	4.4.92		
aintenance		Serial Number	18095144330001		
	Active Link Information				
		Link Type	WWANI		
		IP Address	10.161.213.119		
		Netmask	255.255.255.240		
		Gateway	10.161.213.120		
		Primary DNS Server	219.141.136.10		
		Secondary DNS Server	219.141.140.10		
		IPv6 Global Address	240e:82:f040:d3c6:a818:dcff:fe1c:f944/64		
		IPv6 Gateway	fe80::9835:fbeb:c312:abdb		
		IPv6 Primary DNS Server	240e:40:8000::10		
		IPv6 Secondary DNS Server			



SMS CONTROL

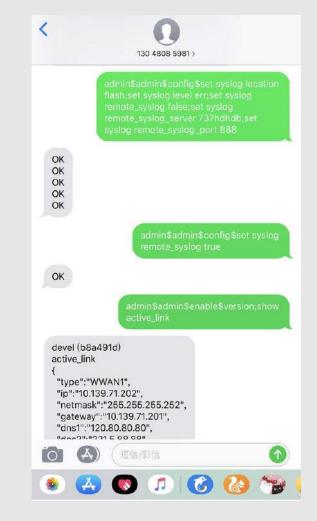


SMS Control

NR500 router dial up successfully with a SIM card. Engineer send SMS to the router with Special SMS Command to control NR500 router restart, configure NR500 router or get the running status of NR500 router.

Note:

Special SMS Command means the router CLI Command. The engineer will send the SMS with CLI Command to control or monitoring the router.





SMS GATEWAY



Solution1:

- NR500 Router go to Internet with SIM card inserted. A Serial Device connect to NR500 router via Serial port and send the SPECIAL characters to NR500 router.
- NR500 Router send out the SMS with related content to specific phone number.

Solution2:

- NR500 Router go to Internet with SIM card inserted. A PLC connect to NR500 \geq router via Ethernet port and send a HTTP request to the router with the special URL.
- NR500 Router send out the SMS with related content to specific phone number.

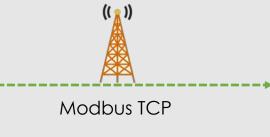




MODBUS GATEWAY



Modbus Gateway (Converter)





SCADA System

Cellular

- NR500 Router runs as Modbus Gateway (Based on TCP Client) and connect to Internet with SIM card.
- A serial device support Modbus RTU protocol and send the data to NR500 router, NR500 will convert Modbus RTU to Modbus TCP.
- Remote side is a SCADA server and assume it can get the Public Static IP address. SCADA server can receive the data format base on Modbus TCP protocol and display on its screen.

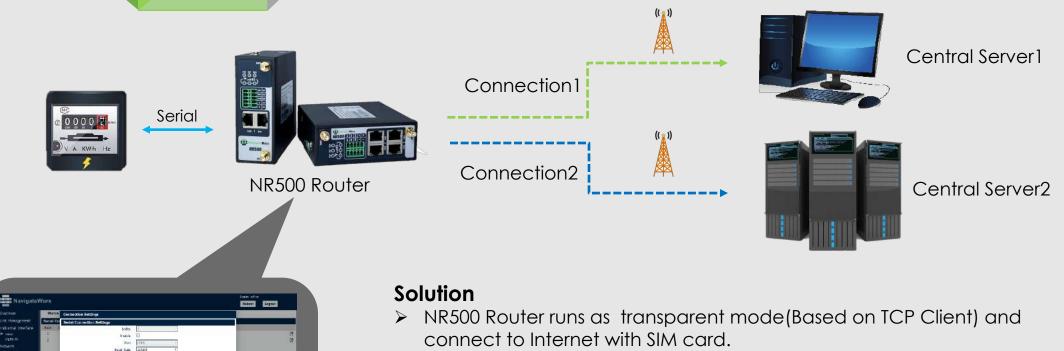




MULTI-CONNECTIONS

Same

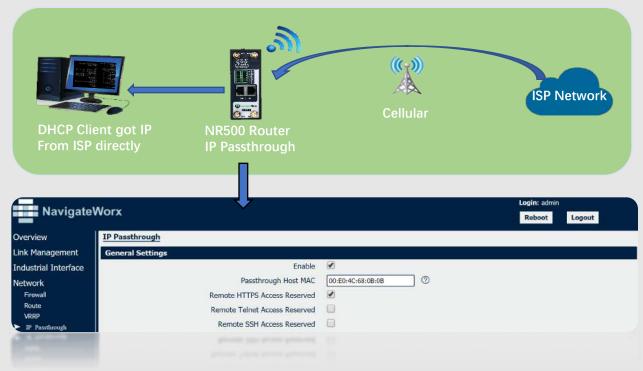
See Addy



- NR500 Routers enable dual TCP connections and connect to dual central servers on remote side.
- A serial device connect to NR500 router via serial port and send the data to NR500 router.
- NR500 will send the data to the remote servers simultaneously for redundancy.



IP PASSTHROUGH



IP passthrough on a router from an ISP means the router will bridges the traffic through to whatever is on the other side (whatever device is connected to the routers LAN port). This is useful if you have a Ethernet Device connected to the router and you want the global IP address from your ISP on the Ethernet Device instead of the router. This setup makes port forwarding much easier for example.

Administrator: Command Prompt

	: Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address	
DHCP Enabled	
Autoconfiguration Enabled	: Yes
Ethernet adapter Ethernet:	
Connection-specific DNS Suffix .	
Description	: Realtek USB GbE Family Controller
Physical Address	: 00-E0-4C-68-0B-0B
DHCP Enabled	: Yes
Autoconfiguration Enabled	
	: fe80:::7927:f2f6:fbc9:976e%10(Preferred)
IPv4 Address	: 10, 245, 208, 195 (Preferred)
Subnet Mask	
	: Tuesday, February 12, 2019 11:14:30 AM
Lease Expires	: Tuesday, February 12, 2019 11:16:30 AM
Default Gateway	· 10 245 208 196
DHCP Server	
DHCPv6 IAID	
	: 00-01-00-01-22-54-49-AA-30-59-B7-16-3B-66
DNS Servers	
	221, 5, 88, 88
NetBIOS over Topip	
THEORY STAT TOPIN, I, I, I, I, I, I	
Ethernet adapter VMware Network Adapt	er VMnetl:
0	
Connection-specific DNS Suffix .	
	: VMware Virtual Ethernet Adapter for VMnet1
Physical Address	
DHCP Enabled	
Autoconfiguration Enabled	
	: fe80::449:d3ed:872d:ba06%19(Preferred)
IPv4 Address	
Subnet Mask	
Lease Obtained	: Tuesday, February 12, 2019 11:14:34 AM
	: Tuesday, February 12, 2019 11:44:33 AM
Default Gateway	
DHCP Server	
DHCPv6 IAID	
	: 00-01-00-01-22-54-49-AA-30-59-B7-16-3B-66
DNS Servers	
	fec0:0:0:ffff::2%1

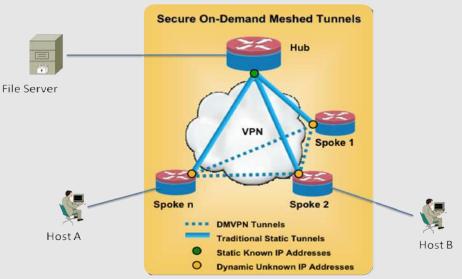


DMVPN

DMVPN (Dynamic Multipoint Virtual Private Network)

- Easy to extend the Spoke Point;
- No need to configure central Hub for adding new point into existing network;
- > No need static public IP address for Spoke any more;
- Spoke communicate directly with Spoke without go through central hub;

Overview	Status	DMVPN			
Unk Management	NHRP Setting	14			
Industrial Interface		Enable	0		
Network		Hub Address	Ĩ.		
Applications		NHRP Mapping Address	-	ī o	
		NHRP Authentication Key	-	=	
VPN OpenVPN		NHRP Holdtime	120	=	
IPSec	mGRE Settin		1		
GRE		mGRE Local Virtual IP	1		
> DMVPN		mGRE Local Virtual Netmask	255,255,255.0	=	
Maintenance		mGRE Tunnel key		= 0	
	IPSec Setting				
	Trode detail	Negotiation Mode	Main		i.
		Local ID Type	None		
		IKE Encryption Algorithm	3065	-	
		IKE Hash Algorithm	MD5		
		IKE Diffie-Heilman Group	Group2(modp1024)	-	
		Pre-shared Key	Contraction of the state of the	=	
		ESP Encryption Algorithm	[3DES	-	
		ESP Hash Algorithm	SHA2 256	-	
		ESP Diffie-Helman Group	None	-	
		car ume-neimai Group	Inche	<u> </u>	



Configuration on NR500 router:

- Hub Address:
 - Enter Hub address to connect to DMVPN
 hub
- NHRP(Next Hop Resolution Protocol):
 - To Solve the dynamic ip address issue of Spoke
- MGRE(Multiple GRE):
 - Mainly use for VPN tunnel establishing
- IPSEC (Internet Protocol Security):
 - Use for data encryption through the VPN tunnel

NavigateWorx

DYNAMIC ROUTING

Navigate	NavigateWorx						Login: admin	k	
							Reboot	Logout	
Overview	Status	Static Rout	te RIP	OSPF	BG	•			
ink Management	Route Ta	ble Information							
ndustrial Interface	Index	Destination	Netmask	Gateway	Metric	Interface			
letwork	1	0.0.00	0.0.0	192.168.111.11	0	wan			
Firewall	2	192.168.5.0	255.255.255.0	0.0.00	0	lan0			
 Route 	3	192.168.10.1	255.255.255.255	192.168.111.200	20	wan			
VRRP	4	192.168.111.0	255.255.255.0	0.0.00	0	wan			
	4					1100			

RIP

one of the oldest distance-vector routing protocols which employ the hop count as a routing metric. The largest number of hops allowed for RIP is 15.

OSPF

Open Shortest Path First (OSPF) was designed as an interior gateway protocol (IGP), for use in an autonomous system such as a local area network (LAN).

BGP

Border Gateway Protocol (BGP) is a standardized exterior gateway protocol designed to exchange routing and reachability information among autonomous systems (AS) on the Internet.



AT OVER IP



Solution

- > NR500 router works as TCP Server and dial up successfully with a SIM card.
- TCP Client connect to TCP Server and send the AT Command to control NR500 module to do some actions. For example to control the module to send out the SMS message to the special phone number.

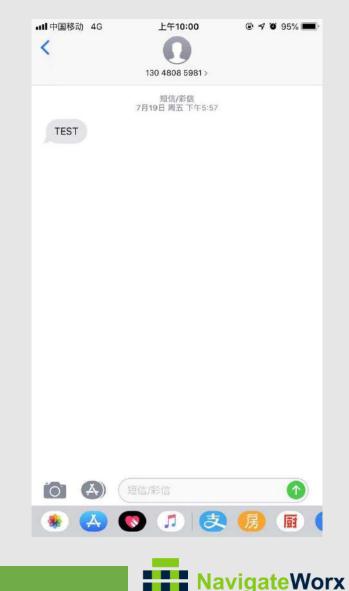


AT OVER TELNET

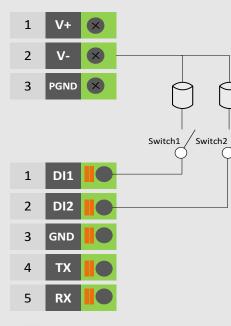


Solution

- NR500 enable AT Over Telnet with the special port and dial up successfully with a SIM card.
- PC connect to NR500 via Telnet protocol and send the AT Command to control NR500 module to do some actions. For example to control the module to send out the SMS message to the special phone number.

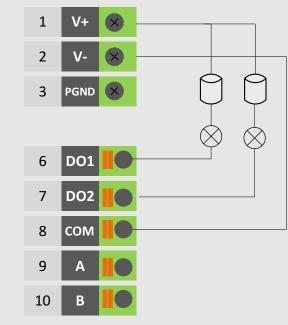


DIGITAL IO



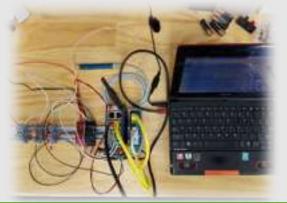
DI ELECTRICAL CHARACTERISTICS 1. Galvanic isolation; 2. Over-Voltage Protection: 36 VDC 3. Over-Current Protection: 100mA per channel @ 25°C

Dry Contact Typical Application Switch ON(Short to V-): DI Logic LOW Switch OFF(Open): DI Logic HIGH



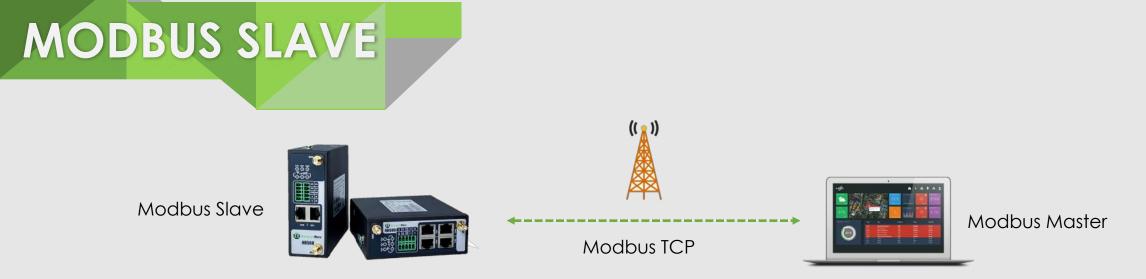
DO ELECTRICAL CHARACTERISTICS 1. Galvanic isolation; 2. Over-Voltage Protection: 36 VDC

Wet Contact Typical Application DO Logic LOW: Switch ON(LED ON) DO Logic HIGH: Switch OFF(LED OFF)



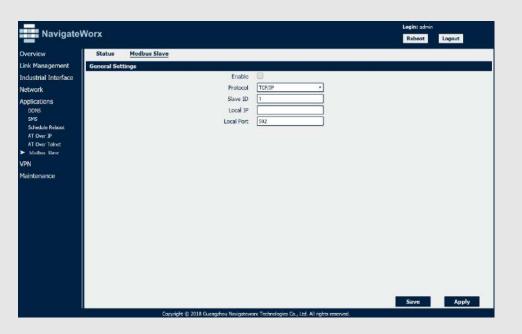
- Digital I/O stands for Digital Input and Output.
- Digital Inputs allow a microcontroller to detect logic states, and Digital Outputs allow a microcontroller to output logic states.
- NR500 router support 2 x Digital Input and 2 x Digital Output





Solution

- NR500 router runs as Modbus Slave with static public IP address with SIM card.
- Modbus Master connect to NR500 router (Modbus Slave) via TCP connection.
- Modbus Master read the statue of Digital IO and control DO.



NavigateWorx



- > GPS
- > A-GPS
- GPS status displayed on webpage
- GPS data send to remote GPS server

GPS POSITIONING

Overview <u>Status</u>	GPS		
Link Management GPS Status			
Industrial Interface		Status	Fixed
Network		Satellites Visible	14
Applications		Satellites Used	8
DDNS		Latitude	51.038231
SMS		Longitude	13.718402
Schedule Reboot Exosite		Altitude	187.300003
Seps		Horizontal speed	0.000000 km/h
► C12		Horizontal speed	0.000000 km/h

MULTIPLE FUNCTIONS



Cellular (ESIM)



Serial Connection



Account Management



Wi-Fi AP or Client mode



Multiple VPN tunnels



Rich syslog output



WAN support, Multiple LAN



Firewall, port mapping, DMZ



DDNS support



Digital Input and output



NTP Client, schedule reboot

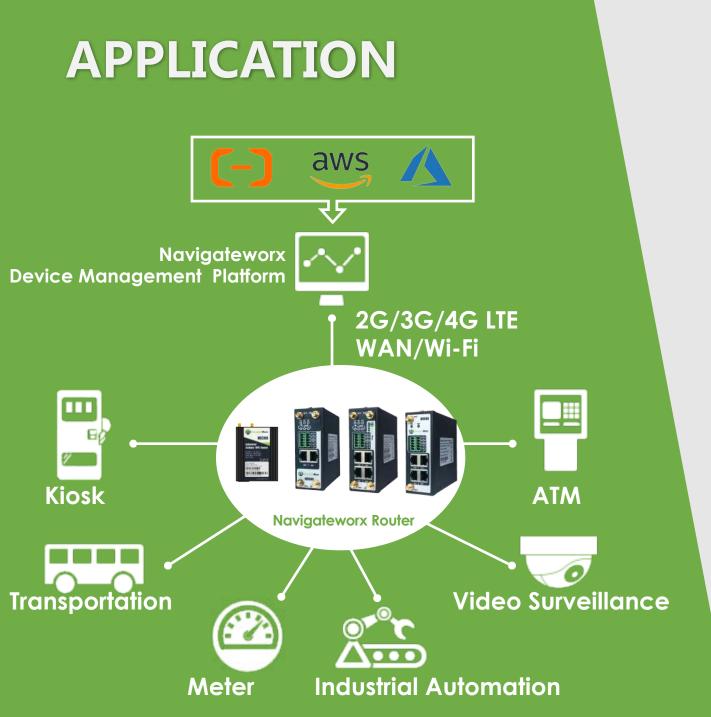
Platform (MQTT)





Navigateworx Device Management Platform

October, 2019



With the development of IoT applications, IoT devices have now penetrated into various industries, such as intelligent transportation, environmental protection, public safety, industrial monitoring, etc., forming a complete ecosystem. The stability of the data communication network is a key part of the entire application.

> Therefore, when more and more devices are deployed, the possibility of device failure is greater. If you effectively manage the health of your network devices, it will become a major concern for many companies.

KEY FEATURES



Device Statistics

Real-time view a wide range of current model, product management, online quantity, number of offline devices, number of inactive devices.



Device Monitoring

Real-time view each device current running information of the device, CPU, memory, firmware version, current interface type, etc.



Device Maintenance

Support for upgrading configuration files, firmware to devices remotely.



User Management

User management, you can create new user groups, or you can create new users to manage devices in the same group.



Friendly UI

User-friendly UI design, login with web browser to manage the platform. Module design, simple operation steps, no need to spend a lot of time training.



High Stability

7 x 24 hours of operating design, multi-layer verification of device connections, avoiding the connection of invalid devices and causing server performance degradation.



SERVICE

Platform	Navigateworx Device Manage	ment Platform
Location	Public server (e.g. Amazon AWS, Alibaba Aliyun)	Customer's private server
Version	Available. Navigateworx Device Management Platform installed on Aliyun public server, providing testing account for our clients.	Provide Navigateworx software with limited license for clients to install on their own server.
Service	 General admin account for all clients Allow to create next level user account for device maintain 	 Installation package: Navigateworx DMP+ User Manual+ Installation guide Support customer to install on their local server Online consultant and best effort technical support
Free	Please contact your Sales Representative	



HARDWARD SPEC

CPU	MEMORY	DISK	OS	DEVICE ACCOUNT	NETWORK
4 (3.1GHz Intel® Xeon® Platinum 8000)	8GB	128GB	Centos7+	0-1K	10MB
4 (3.1GHz Intel® Xeon® Platinum 8000)	8GB	256GB	Centos7+	1K-2K	20MB
4 (3.1GHz Intel® Xeon® Platinum 8000)	8GB	512GB	Centos7+	2K-4K	100MB
4 (3.1GHz Intel® Xeon® Platinum 8000)	8GB	1024GB	Centos7+	4K-6K	100MB





Thanks

