

Getting started guide

Functionality

The R718PA22 is a wireless communication device that measures the liquid level with an ultrasonic liquid level sensor. Ultrasonic liquid level sensor installed at the bottom of the container, it may measure water, gasoline, diesel and small, medium, large capacity storage tanks (metal, plastic, glass material). R718PA22 main unit and the ultrasonic liquid level sensor communicate via RS485 interface, and the detected data is sent to the other equipment shown which employs compliance LoraWAN™ wireless communication protocol standards.

Install CLI for AWS IoT Things Graph

Install AWS CLI

<https://docs.aws.amazon.com/cli/latest/userguide/cli-chap-install.html>

Install preview Things Graph API models

<https://docs.aws.amazon.com/cli/latest/reference/configure/add-model.html>

```
aws configure add-model --service-name iotthingsgraph --service-model file://service-2.json
```

Install jq

<https://stedolan.github.io/jq/>

Verify preview model installed

```
aws iotthingsgraph map-property help
```

expected to see help output instead of "Invalid choice" error message

Find your desired device

1. Go to AWS device catalog page: <https://devices.amazonaws.com>
2. Locate your desired sensor.
3. For private beta, Things Graph is using API v1. For API v1, use the model file sensor_model.json (device manufacturer enters their model file name). For production, Things Graph will use API v2. For API v2, please use the S3 URL link that you see in the Device catalog page.

Using the device model

The following tests will show the different use cases and binary messages than be used with the model. You can use the binary test data to verify correct functionality of the model.

1. Test name: Report Data Command
 - a. Mapping used: map_R718PA22_Uplink
 - b. Use case tested: Report Data
 - c. Payload format: port = 6

FPort : 0x06

Bytes	1	1	1	Var(Fix=8 Bytes)
	Version	DeviceType	ReportType	NetvoxPayloadData

Version– 1 bytes –0x01 – – the Version of NetvoxLoRaWAN Application Command Version

DeviceType– 1 byte – Device Type of Device

The devicetype is listed in Netvox LoRaWAN Application Devicetype V1.9.doc

ReportType – 1 byte –the Presentation of the NetvoxPayloadData , according the devicetype

NetvoxPayloadData– Fixed bytes (Fixed =8bytes)–

R718PA22/(R731A22/R731BC22/R731BD22/R731BE22)	0x9B/0xAE	0x01	Battery(1Byte, unit:0.1V)	Depth(2Bytes, Unit:1mm)	Temperature(Signed2Bytes,, Unit: 1°C)	InstallStatus(1Byte,0x00_success,0x01_failure)	Reserved(2Bytes, fixed 0x00)
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d. Input binary data: 0x019B01240100000A000000 (DeviceType: 0x9B, ReportType: 0x01)

e. API call (V1):

```
aws iotthingsgraph map-property \
  --region us-east-1 \
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \
  --namespace-snapshot file:///path/to/model/json/file \
  --property-value "019B01240100000A000000" \
  --mapping-info '{"mappingId":"urn:tdm:us-east-1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD", "contextProvider":{"json": "{\\"port\\":6}"}}'
```

f. Expected results (V1)

```
{
  "propertyId": "Netvox_R718PA22_Uplink/types/UplinkPort6Payload",
  "propertyValue":{"
    "DeviceType": "R718PA22",
    "Version": 1,
    "Battery": 3.6,
    "InstallStatus": "success",
    "ReportType": 1,
    "Depth": 256,
    "Temperature": 10
  }}"
}
```

2. Test name:

ConfigReportReq,ConfigReportRsp,ReadConfigReportReq,ReadConfigReportRsp,SetMeasureTypeReq,SetMeasureTypeRsp,GetMeasureTypeReq,GetMeasureTypeRsp

- a. Mapping used: map_R718PA22_Uplink
- b. Use case tested: Start warning immediately
- c. Payload format: port = 7

FPort : 0x07

Bytes	1	1	Var(Fix =9 Bytes)						
	CmdID	DeviceType	NetvoxPayloadData						

CmdID- 1 bytes -
 DeviceType- 1 byte - Device Type of Device
 The devicetype is listed in [Netvox LoRaWAN Application Devicetype V1.9.doc](#)
 NetvoxPayloadData- var bytes (Max=9bytes)-

ConfigReportReq		0x01		MinTime(2bytes Unit:s)	MaxTime(2bytes Unit:s)	BatteryChange(1byte Unit:0.1v)	DepthChange(2bytes,Unit:1mm)	TemperatureChange(1byte,Unit:1℃)	Reserved (1Bytes,Fixed 0x00)
ConfigReportRsp		0x81		Status(0x00_success)	Reserved (8Bytes,Fixed 0x00)				
ReadConfigReportReq		0x02		Reserved (9Bytes,Fixed 0x00)					
ReadConfigReportRsp	R718PA22/(R731A22/R731B22/R731BD22/R731BE22)	0x82	0x9B/0xAE	MinTime(2bytes Unit:s)	MaxTime(2bytes Unit:s)	BatteryChange(1byte Unit:0.1v)	DepthChange(2bytes,Unit:1mm)	TemperatureChange(1byte,Unit:1℃)	Reserved (1Bytes,Fixed 0x00)
SetMeasureTypeReq		0x03		Measuretype (1byte, 0x01_water, 0x02_gasoline, 0x03_diesel oil)	Reserved (8Bytes,Fixed 0x00)				
SetMeasureTypeRsp		0x83		Status(0x00_success)	Reserved (8Bytes,Fixed 0x00)				
GetMeasureTypeReq		0x04		Reserved (9Bytes,Fixed 0x00)					
GetMeasureTypeRsp		0x84		Measuretype (1byte, 0x01_water, 0x02_gasoline, 0x03_diesel oil)	Reserved (8Bytes,Fixed 0x00)				

d. Input binary data: 0x019B000A00640000000000

e. API call:

```
aws iotthingsgraph map-property \
  --region us-east-1 \
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \
  --namespace-snapshot file:///path/to/model/json/file \
  --property-value "019B000A00640000000000" \
  --mapping-info '{"mappingId":"urn:tdm:us-east-1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD", "contextProvider":{"json": "{\\"port\\":7}"}}'
```

f. Expected results

```
{
  "propertyId": "{
    "DeviceType": "Netvox_R718PA22_Uplink/types/DeviceTypeEnum",
    "CmdId": "Netvox_R718PA22_Uplink/types/CmdIdEnum",
    "Payload": "Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"
  }",
  "propertyValue": "{
    "DeviceType": "R718PA22",
    "CmdId": "ConfigReportReq",
    "Payload": {
      "DepthChange": 0,
      "MiniTime": 10,
      "MaxTime": 100,
      "TemperatureChange": 0,
      "BatteryChange": 0
    }
  }"
}
```

g. Input binary data: 0x819B00000000000000000000

h. API call:

```
aws iotthingsgraph map-property \
  --region us-east-1 \
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \
  --namespace-snapshot file:///path/to/model/json/file \
  --property-value "819B00000000000000000000" \
  --mapping-info '{"mappingId":"urn:tdm:us-east-1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD", "contextProvider":{"json": "{\\"port\\":7}"}}'
```

i. Expected results

```
{
  "propertyId": "{
    "DeviceType": "Netvox_R718PA22_Uplink/types/DeviceTypeEnum",
    "CmdId": "Netvox_R718PA22_Uplink/types/CmdIdEnum",
    "Payload": "Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"
  }",
  "propertyValue": "{
    "DeviceType": "R718PA22",
    "CmdId": "ConfigReportRsq",
    "Payload": {
      "Status": "success"
    }
  }"
}
```

j. Input binary data: 0x029B00000000000000000000

k. API call:

```
aws iotthingsgraph map-property \
  --region us-east-1 \
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \
  --namespace-snapshot file:///path/to/model/json/file \
```

```
--property-value "029B0000000000000000" \  
--mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": "{\\"port\\":7}"}}'
```

l. Expected results

```
{  
  "propertyId":{"  
    "DeviceType":"Netvox_R718PA22_Uplink/types/DeviceTypeEnum",  
    "CmdId":"Netvox_R718PA22_Uplink/types/CmdIdEnum",  
    "Payload":"Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"  
  }},  
  "propertyValue":{"  
    "DeviceType": "R718PA22",  
    "CmdId": "ReadConfigReportReq"  
  }"  
}
```

m. Input binary data: 0x829B000A00640000000000

n. API call:

```
aws iotthingsgraph map-property \  
  --region us-east-1 \  
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \  
  --namespace-snapshot file:///path/to/model/json/file \  
  --property-value "829B000A00640000000000" \  
  --mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": "{\\"port\\":7}"}}'
```

o. Expected results

```
{  
  "propertyId":{"  
    "DeviceType":"Netvox_R718PA22_Uplink/types/DeviceTypeEnum",  
    "CmdId":"Netvox_R718PA22_Uplink/types/CmdIdEnum",  
    "Payload":"Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"  
  }},  
  "propertyValue":{"  
    "DeviceType": "R718PA22",  
    "CmdId": "ReadConfigReportRsp",  
    "Payload": {  
      "DepthChange": 0,  
      "MiniTime": 10,  
      "MaxTime": 100,  
      "TemperatureChange": 0,  
      "BatteryChange": 0  
    }  
  }"  
}
```

p. Input binary data: 0x039B01000000000000000000

q. API call:

```
aws iotthingsgraph map-property \  
  --region us-east-1 \  
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \  
  --namespace-snapshot file:///path/to/model/json/file \  
  --property-value "039B01000000000000000000" \  
  --mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": "{\\"port\\":7}"}}'
```

```
--region us-east-1 \  
--endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \  
--namespace-snapshot file:///path/to/model/json/file \  
--property-value "039B0100000000000000" \  
--mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": "{\\"port\\":7}"}}'
```

r. Expected results

```
{  
  "propertyId":{"  
    "DeviceType":"Netvox_R718PA22_Uplink/types/DeviceTypeEnum",  
    "CmdId":"Netvox_R718PA22_Uplink/types/CmdIdEnum",  
    "Payload":"Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"  
  }},  
  "propertyValue":{"  
    "DeviceType": "R718PA22",  
    "CmdId": "SetMeasureTypeReq",  
    "Payload": {  
      "Measuretype": "water"  
    }  
  }  
}
```

s. Input binary data: 0x839B00000000000000000000

t. API call:

```
aws iotthingsgraph map-property \  
--region us-east-1 \  
--endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \  
--namespace-snapshot file:///path/to/model/json/file \  
--property-value "839B00000000000000000000" \  
--mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": "{\\"port\\":7}"}}'
```

u. Expected results

```
{  
  "propertyId":{"  
    "DeviceType":"Netvox_R718PA22_Uplink/types/DeviceTypeEnum",  
    "CmdId":"Netvox_R718PA22_Uplink/types/CmdIdEnum",  
    "Payload":"Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"  
  }},  
  "propertyValue":{"  
    "DeviceType": "R718PA22",  
    "CmdId": "SetMeasureTypeRsp",  
    "Payload": {  
      "Status": "success"  
    }  
  }  
}
```

v. Input binary data: 0x049B0000000000000000

w. API call:

```
aws iotthingsgraph map-property \  
  --region us-east-1 \  
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \  
  --namespace-snapshot file:///path/to/model/json/file \  
  --property-value "049B0000000000000000" \  
  --mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": {"port":7}}}'
```

x. Expected results

```
{  
  "propertyId":{"  
    "DeviceType":"Netvox_R718PA22_Uplink/types/DeviceTypeEnum",  
    "CmdId":"Netvox_R718PA22_Uplink/types/CmdIdEnum",  
    "Payload":"Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"  
  }},  
  "propertyValue":{"  
    "DeviceType": "R718PA22",  
    "CmdId": "GetMeasureTypeReq"  
  }  
}
```

y. Input binary data: 0x849B010000000000000000

z. API call:

```
aws iotthingsgraph map-property \  
  --region us-east-1 \  
  --endpoint-url "https://iotthingsgraph.us-east-1.amazonaws.com" \  
  --namespace-snapshot file:///path/to/model/json/file \  
  --property-value "849B0100000000000000" \  
  --mapping-info '{"mappingId":"urn:tdm:us-east-  
1/000000000000/default:mapping:map_R718PA22_Uplink","mappingDirection": "FORWARD",  
"contextProvider":{"json": {"port":7}}}'
```

aa. Expected results

```
{  
  "propertyId":{"  
    "DeviceType":"Netvox_R718PA22_Uplink/types/DeviceTypeEnum",  
    "CmdId":"Netvox_R718PA22_Uplink/types/CmdIdEnum",  
    "Payload":"Netvox_R718PA22_Uplink/types/ConfigureCmdPayload"  
  }},  
  "propertyValue":{"  
    "DeviceType": "R718PA22",  
    "CmdId": "GetMeasureTypeRsp",  
    "Payload": {  
      "Measuretype": "water"  
    }  
  }  
}
```

Support

For questions on this model, please contact: support@netvox.com.tw