

# MMS Service for Windows User Manual

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**MOXA**®

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# MMS Service for Windows User Manual

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# 1. Overview

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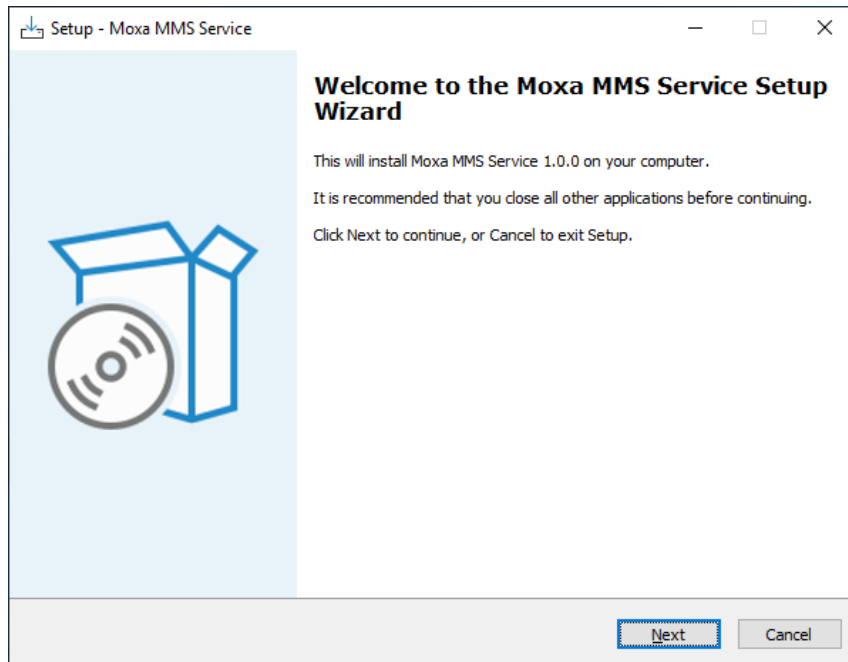
This manual describes the steps to install the **Moxa MMS Service** and obtain data using the IEC 61850 protocol. The service will be supported on the following Moxa computers:

Series	Comments
<b>DA-820C Series</b>	Supported
<b>DA-682C Series</b>	Coming soon
<b>DA-681C Series</b>	Coming soon
<b>DA-720 Series</b>	Coming soon

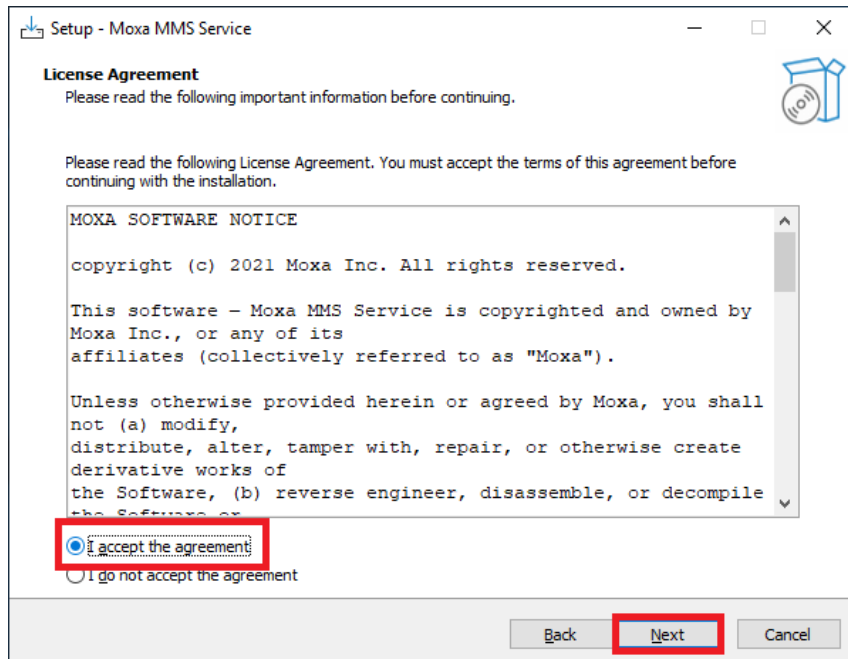
## 2. Installing the Moxa MMS Service

To install the **Moxa MMS Service** on an eligible Moxa computer, do the following:

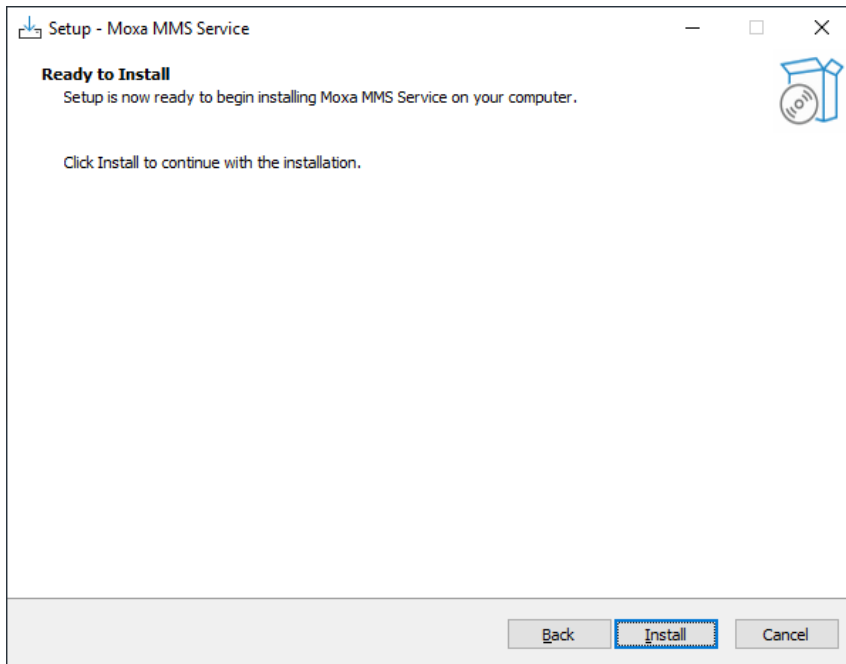
1. Download the latest version of the **MMS Service** package from the product page of the Moxa computer and run the setup file.
2. Click **Next**.



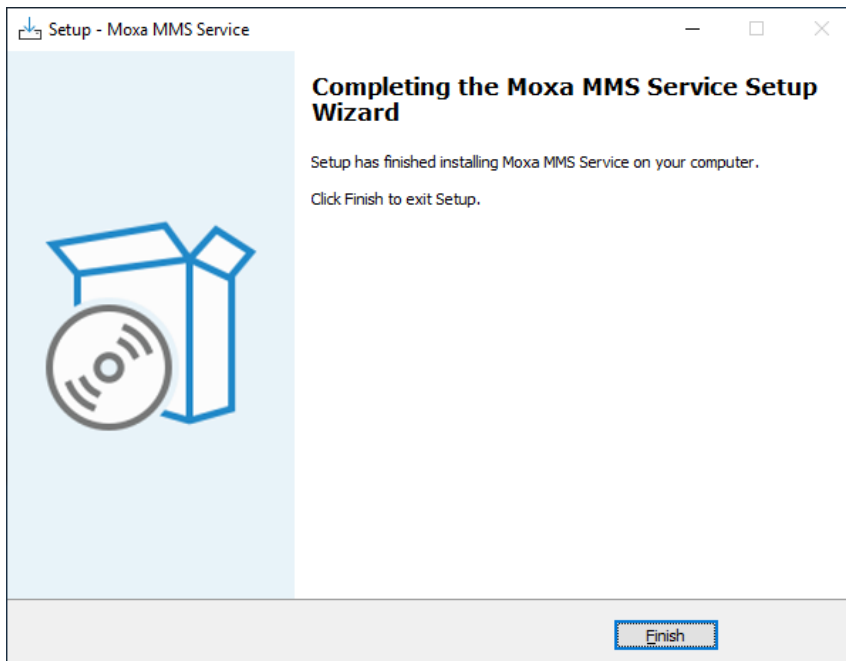
3. Accept the agreement and click **Next** to continue.



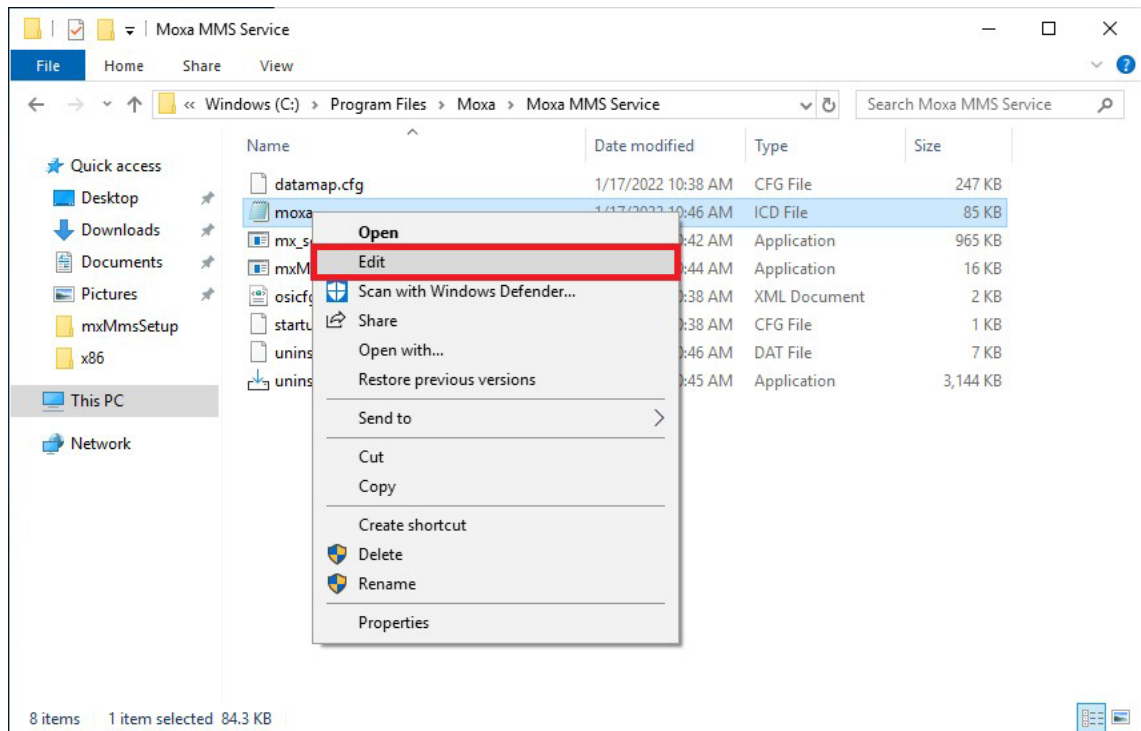
4. Click **Install**.



5. After the installation is complete, click **Finish**.



6. (optional) Modify the ICD file.
  - a. Navigate to the Moxa MMS Server installing folder (C:\Windows\Program Files\Moxa\Moxa MMS Service), right click on the **moxa.icd** file, and click **Edit**.

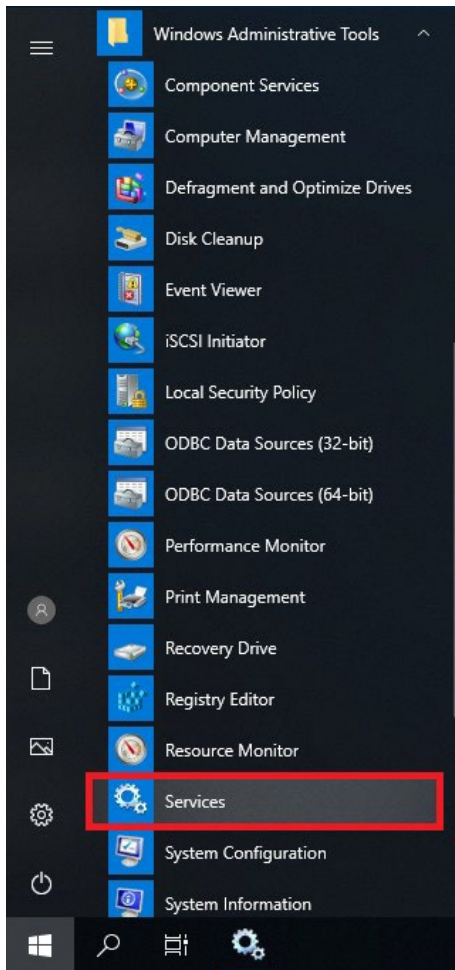


- b. Modify the **IP** and **IP Subnet** addresses to match the target device.

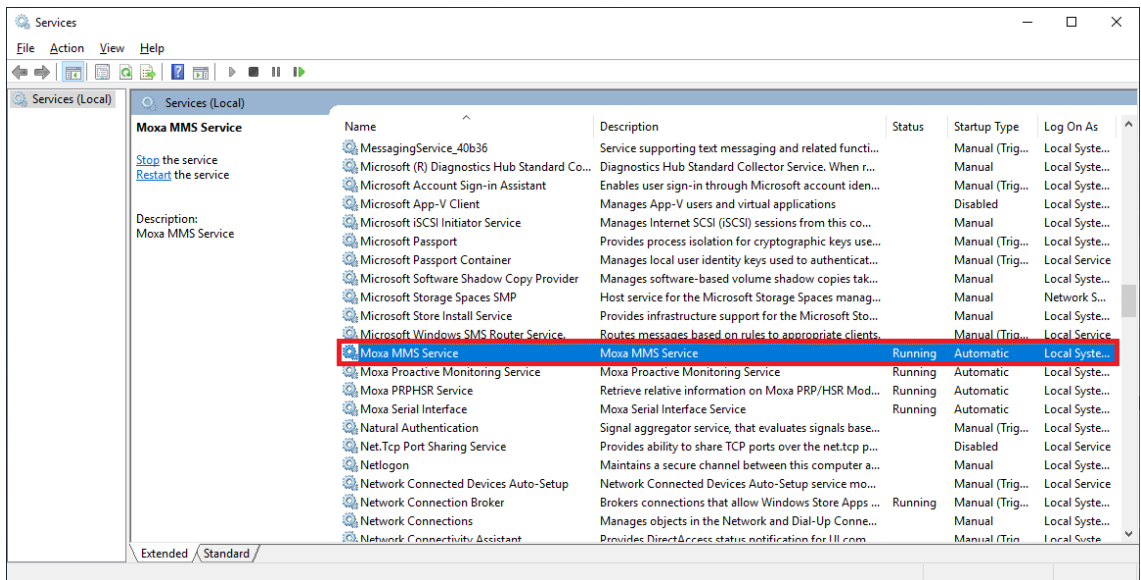


- c. Save and close the ICD file.
7. Restart the computer.

8. From the Windows Start menu, navigate to **Services**.



9. Confirm that the **Moxa MMS Service** is **Running**.





# 3. Viewing the System and Expansion Card Status

## Card Status

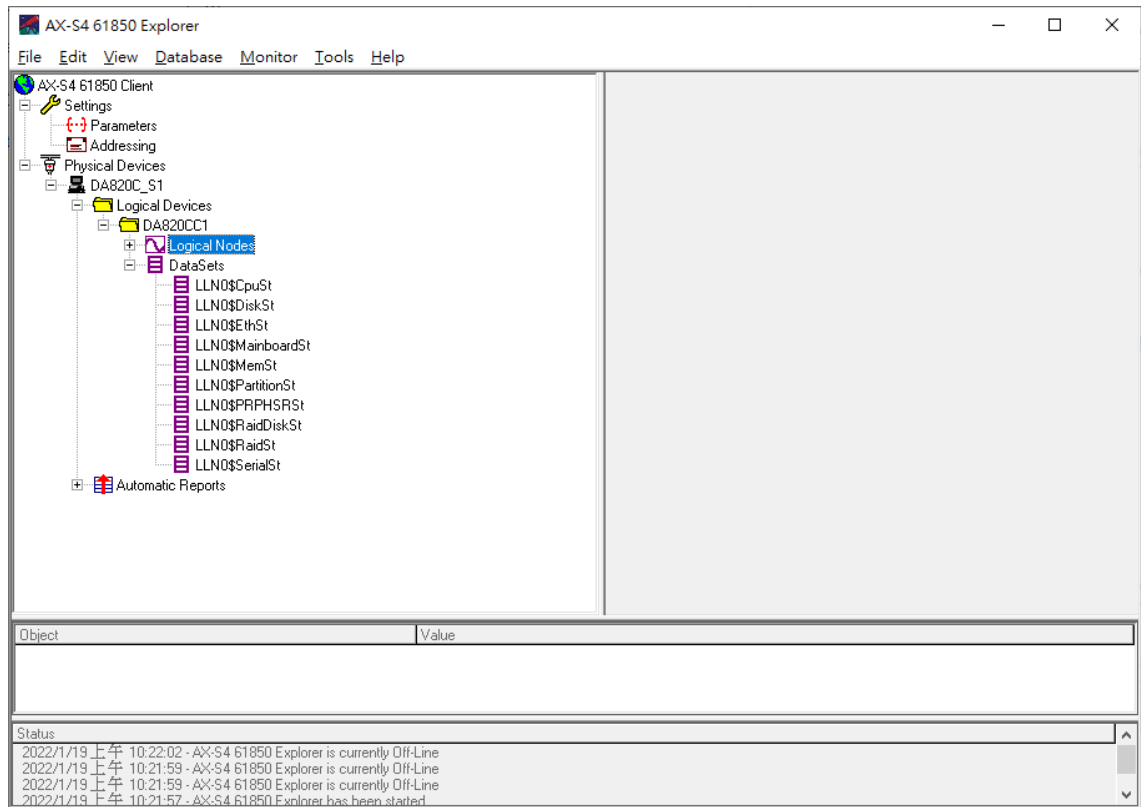
To view the status of the system and the PRP/HSR expansion card, do the following:

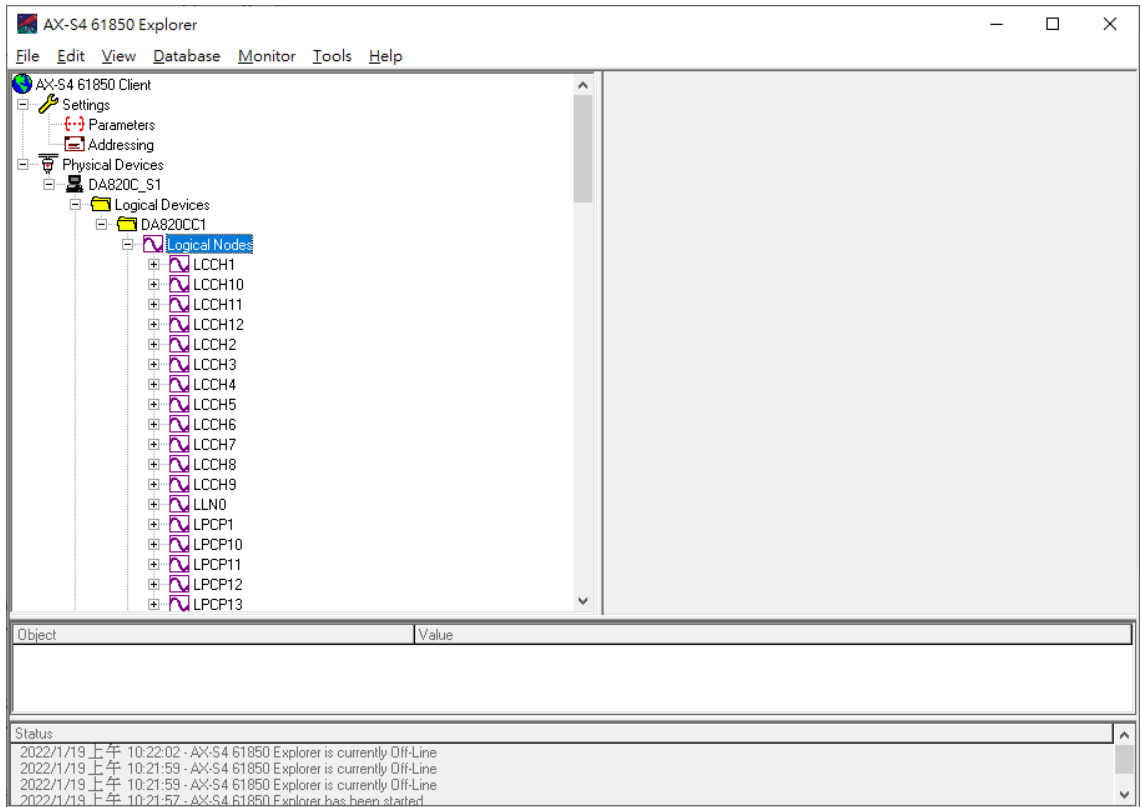
1. Open the MMS client on the computer and import the ICD file from the installing folder (C:\Windows\Program Files\Moxa\Moxa MMS Service).  
All Logical Nodes and DataSets are shown under **Logical Devices**.



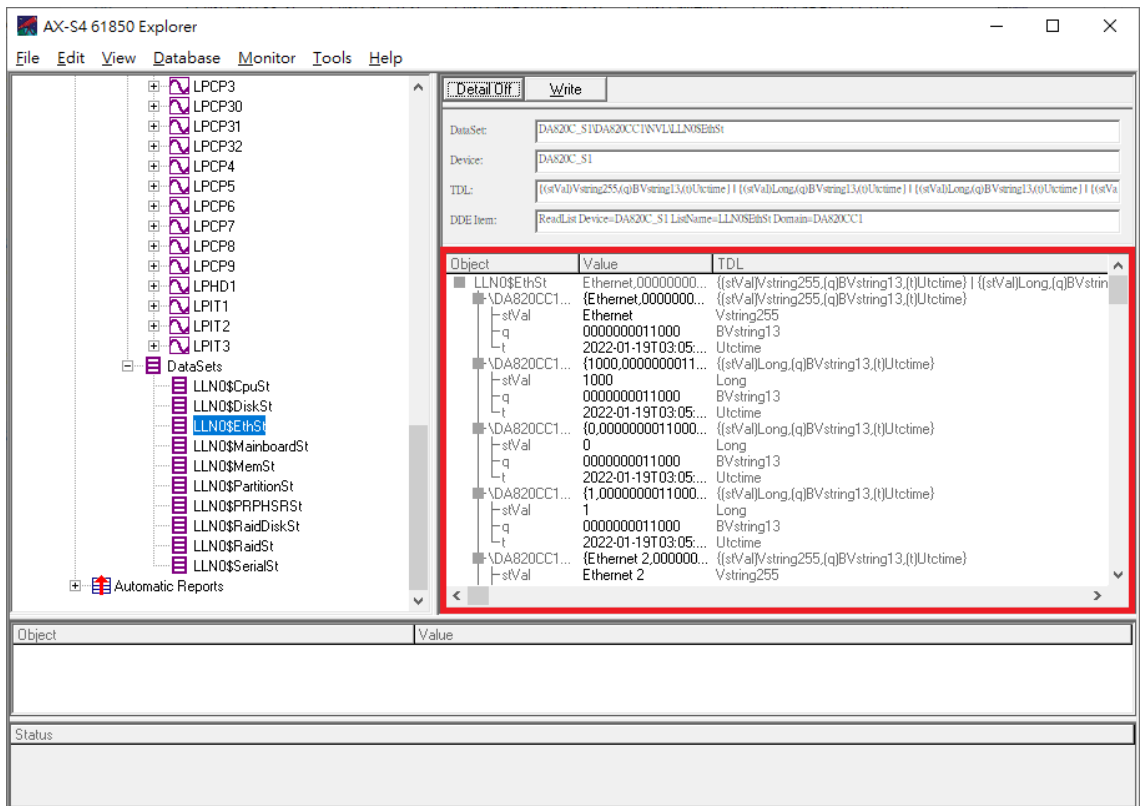
### NOTE

The third-party SISCO AX-S4 61850 explorer is used as an example in the following instructions.



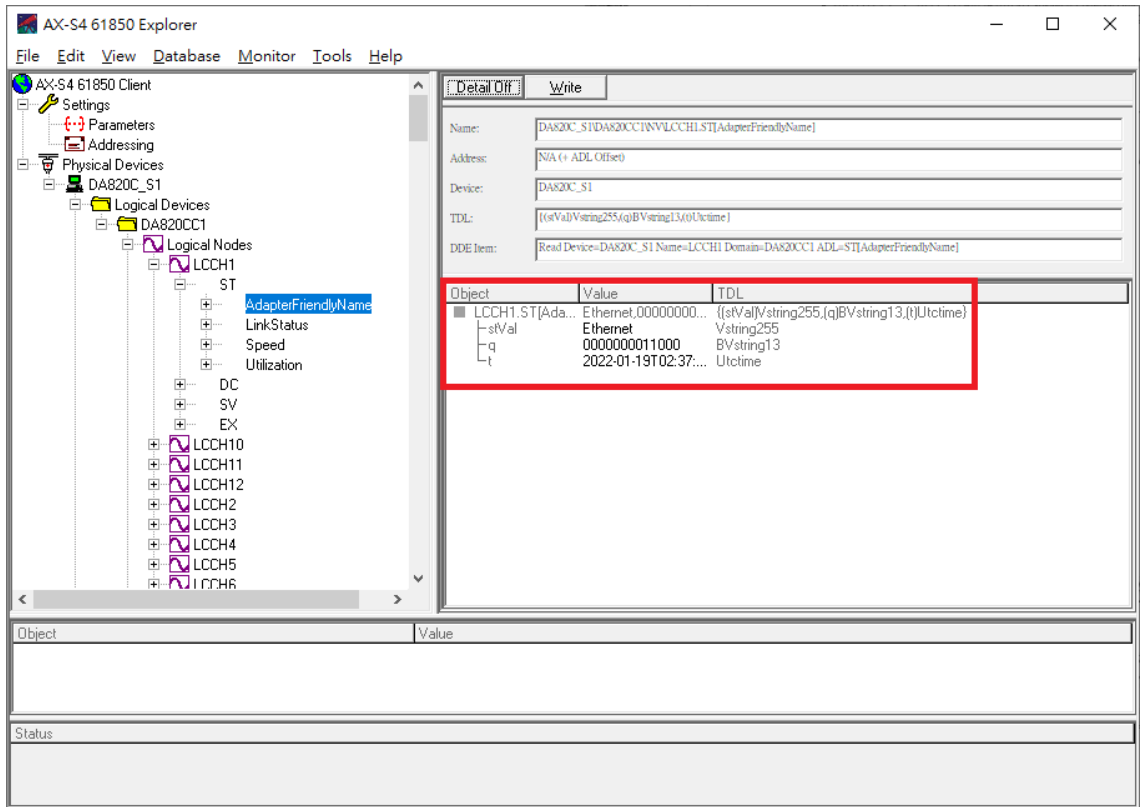


2. Connect to the MMS server.
3. To view the system status, select **Data Object** under **Logical Nodes**<sup>[1]</sup> or **DataSet**<sup>[2]</sup> to obtain the value from MMS server.

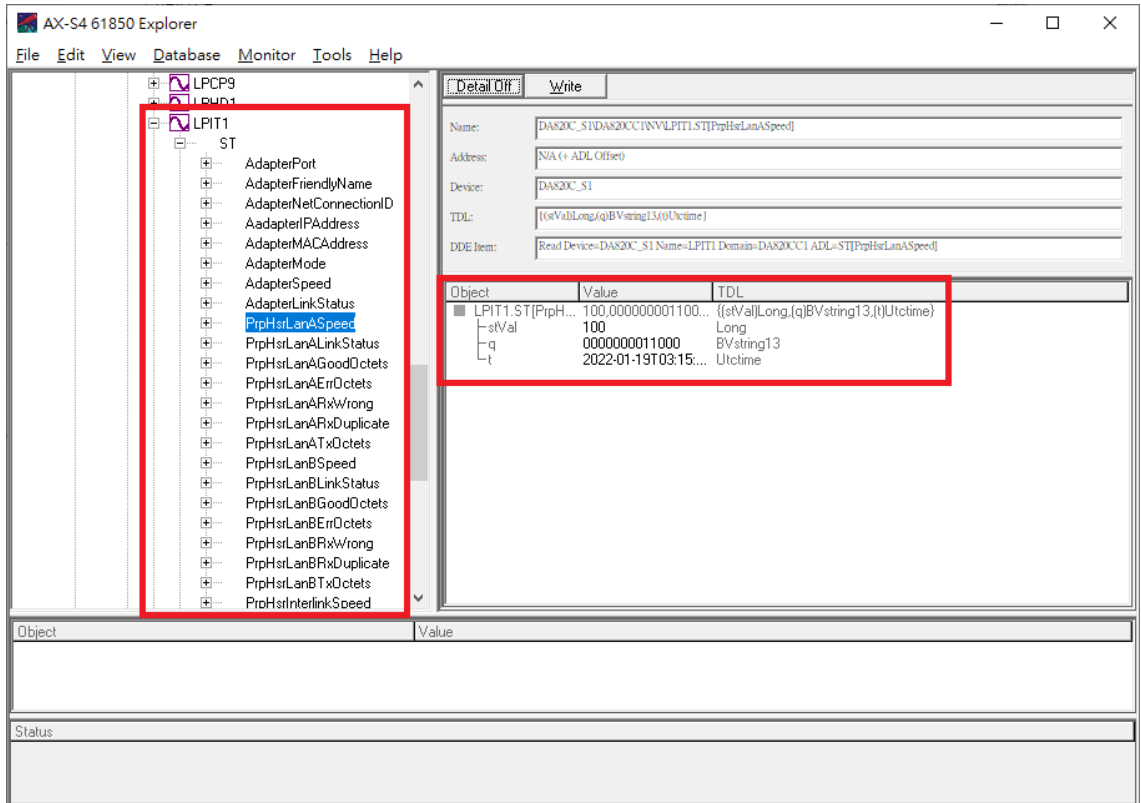


<sup>1</sup> Logical nodes of system status: **LPHD, LCCH, LPCP**

<sup>2</sup> DataSets of system status: **LLN0\$CpuSt, LLN0\$DiskSt, LLN0\$EthSt, LLN0\$MainboardSt, LLN0\$MemSt, LLN0\$PartitionSt, LLN0\$RaidDiskSt, LLN0\$RaidSt, LLN0\$SerialSt**



4. To view the status of the expansion card (PRP/HSR), select **DataSet<sup>[3]</sup>** or **Data Object** under **Logical Nodes<sup>[4]</sup>** to obtain the value from the MMS server.



<sup>3</sup> Logical nodes of expansion card (PRP/HSR) status: **LPIT**

<sup>4</sup> DataSets of expansion card (PRP/HSR) status: **LLNO\$PRPHSRST**

AX-S4 61850 Explorer

File Edit View Database Monitor Tools Help

PipHstLanBRxDuplicate  
 PipHstLanBTxDctets  
 PipHstInterlinkSpeed  
 PipHstInterlinkLinkStatus  
 PipHstInterlinkGoodDctets  
 PipHstInterlinkErrDctets  
 PipHstInterlinkRwWrong  
 PipHstInterlinkRxDuplicate  
 PipHstInterlinkTxDctets  
  
 DC  
 SV  
 EX  
 LPIT2  
 LPIT3  
 DataSets  
 LLN0\$CpuSt  
 LLN0\$DiskSt  
 LLN0\$EthSt  
 LLN0\$MainboardSt  
 LLN0\$MemSt  
 LLN0\$PartitionSt  
 LLN0\$PRPHSRSt  
 LLN0\$RaidDiskSt  
 LLN0\$RaidSt  
 LLN0\$SerialSt  
 Automatic Reports

Detail Off Write  
 DataSet: DAS20C\_S1\DAS20CC1\WVL\LLN0\$PRPHSRSt  
 Device: DAS20C\_S1  
 TDL: [(stVal)Long.(q)BVstring13.(t)Utime] | [(stVal)Vstring255.(q)BVstring13.(t)Utime] |  
 DDE Item: ReadLast Device=DAS20C\_S1 ListName=LLN0\$PRPHSRSt Domain=DAS20CC1

Object	Value	TDL
LLN0\$PRPHSRSt	5,0000000011000...	{(stVal)Long.(q)BVstring13.(t)Utime}   {(stVal)Vstring255.(q)BVstring13.(t)Utime}
\DA820CC1...	{5,0000000011000...	{(stVal)Long.(q)BVstring13.(t)Utime}
-stVal	5	Long
-q	0000000011000	BVstring13
-t	2022-01-19T03:16:...	Utime
\DA820CC1...	{Intel(R) I210 Gigab...	{(stVal)Vstring255.(q)BVstring13.(t)Utime}
-stVal	Intel(R) I210 Gigabi...	Vstring255
-q	0000000011000	BVstring13
-t	2022-01-19T03:16:...	Utime
\DA820CC1...	{PRPEthernet #1,0...	{(stVal)Vstring255.(q)BVstring13.(t)Utime}
-stVal	PRPEthernet #1	Vstring255
-q	0000000011000	BVstring13
-t	2022-01-19T03:16:...	Utime
\DA820CC1...	{169,254.39,225,0...	{(stVal)Vstring255.(q)BVstring13.(t)Utime}
-stVal	169,254.39,225,0...	Vstring255
-q	0000000011000	BVstring13
-t	2022-01-19T03:16:...	Utime
\DA820CC1...	{00-90-E8-00-FB-49...	{(stVal)Vstring255.(q)BVstring13.(t)Utime}
-stVal	00-90-E8-00-FB-49	Vstring255

Object Value

Status

# 4. Logical Nodes and DataSets in the Moxa ICD File

## Logical Nodes

- **LPHD:** System and mainboard statuses of the physical device are included in this node. The details of the LPHD data objects are listed here.

Tag Name	Path	Comment	Data Format	Range	Description
<b>CpuUsage</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$CpuUsage].stVal.Value	Value	Integer	0 to 100	The current CPU total usage. The ranges of usage from 0(%) to 100(%)
<b>CpuTemperature</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$CpuTemperature].stVal.Value	Value	Integer		The current CPU temperature. The unit of value is 'Celsius'.
<b>CpuVolt</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$CpuVolt].stVal.Value	Value	Integer		The current CPU voltage. The unit of value is 'mV'. '-1' is returned if CPU voltage is not supported.
<b>CpuLogicCount</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$CpuLogicCount].stVal.Value	Value	Integer		The current usage of each processor.
<b>LogicProcessor[x]Usage, x:1~8</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$LogicProcessor[x]Usage].stVal.Value, x:1~8	Value	Integer	0 to 100	The current usage of each processor. The ranges of usage from 0(%) to 100(%)
<b>MemVolt</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MemVolt].stVal.Value	Value	Integer		The current DRAM voltage. The unit of value is 'mV'. '-1' is returned if DRAM voltage is not supported.
<b>MemUsg</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MemUsg].stVal.Value	Value	Integer	0 to 100	The current memory usage. The ranges of usage from 0(%) to 100(%)
<b>MemTotalSize</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MemTotalSize].stVal.Value	Value	Integer		The current memory total size. The unit of value is 'MBytes'.
<b>MemAvailSize</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MemAvailSize].stVal.Value	Value	Integer		The current memory available size. The unit of value is 'MBytes'.
<b>MainboardTemperature</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MainboardTemperature].stVal.Value	Value	Integer		The current mainboard temperature. The unit of value is 'Celsius'.

Tag Name	Path	Comment	Data Format	Range	Description
<b>MainboardVolt</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MainboardVolt].stVal.Value	Value	Integer		The mainboard voltage. The unit of value is 'mV'.
<b>MainboardPwr1 Up</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MainboardPwr1Up].stVal.Value	0, 1, 2	Integer		The mainboard power 1 status. The 'fail(0)' is returned when power 1 is deactivated. The 'activated(1)' is returned when power 1 is activated. The 'notsupport(2)' is returned when the managed device does not support the power indicator.
<b>MainboardPwr2 Up</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MainboardPwr2Up].stVal.Value	0, 1, 2	Integer		The mainboard power 2 status. The 'fail(0)' is returned when power 2 is deactivated. The 'activated(1)' is returned when power 2 is activated. The 'notsupport(2)' is returned when the managed device does not support the power indicator.
<b>MainboardPowerIndicator</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$MainboardPowerIndicator].stVal.Value	0, 1, 2, 3	Integer		The mainboard power status. The 'notsupport(0)' is returned when the managed device does not support the power indicator. The 'pwr1(1)' is returned when only power1 is activated. The 'pwr2(2)' is returned when only power2 is activated. The 'dualpower(3)' is returned when both power are activated.
<b>Disk[x]SlotStatus, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Disk[x]SlotStatus].stVal.Value, x:0~4	1, 2, 3	Integer		The slot status on the managed device. If the disk doesn't insert into the slot when the Proactive Monitoring service start, the value 'nodisk(1)' is returned. If the disk insert into the slot, the value 'good(2)' is returned. If the disk had been unplugged from slot, the value 'unplugged(3)' is returned.
<b>Disk[x]Port, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Disk[x]Port].stVal.Value, x:0~4	Value	Integer		The disk port number on the managed device. The ranges of this value from 0 to the port number of disk on the managed device.

Tag Name	Path	Comment	Data Format	Range	Description
<b>Disk[x]HealthStatus, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Disk[x]HealthStatus].stVal.Value, x:0~4	1, 2, 3	Integer		The current disk health status. If the disk doesn't insert into the slot, the value 'nodisk(1)' is returned. If the disk work properly, the value 'normal(2)' is returned. If the disk reallocated sectors count, current pending sector count and uncorrectable sector count which is more than 1, the value 'error(3)' is returned.
<b>Disk[x]SerialNumber, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Disk[x]SerialNumber].stVal.Value, x:0~4	Value	String		The unique serial number of each disk.
<b>Disk[x]AvgEraseCount, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Disk[x]AvgEraseCount].stVal.Value, x:0~4	Value	Integer		The current disk Avg Erase Count. If the disk doesn't support avg erase count, the value '-1' is returned.
<b>Partition[x]Usage, x:A~Z</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Partition[x]Usage].stVal.Value, x:A~Z	Value	Integer	0 to 100	The current usage of each partition. The ranges of usage from 0(%) to 100(%). Value '-1' is returned if partition doesn't exist.
<b>Partition[x]TotalSize, x:A~Z</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Partition[x]TotalSize].stVal.Value, x:A~Z	Value	Integer		The current partition total size. The unit of this value is 'MBytes'. Value '-1' is returned if partition doesn't exist.
<b>Partition[x]AvailableSize, x:A~Z</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Partition[x]AvailableSize].stVal.Value, x:A~Z	Value	Integer		The current partition available size. The unit of this value is 'MBytes'. Value '-1' is returned if partition doesn't exist.
<b>Volume[x]RaidMode, x:0~1</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidMode].stVal.Value, x:0~1	-1, 0, 1, 5, 10	Integer		The RAID mode. '-1' is returned if no RAID Volume exist.
<b>Volume[x]RaidRedundancyStatus, x:0~1</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidRedundancyStatus].stVal.Value, x:0~1	0, 1, 2, 3	Integer		The RAID Redundancy Status. If the redundancy status is not ok, '0' is returned. If the redundancy status is work perperly, the value '1' is returned. If the redundancy status is in rebuild the value '2' is returned. If the redundancy status is migrating data, '3' is returned.
<b>Volume[x]RaidVolumeName, x:0~1</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidVolumeName].stVal.Value, x:0~1	Value	String		The volume name of the RAID.

Tag Name	Path	Comment	Data Format	Range	Description
<b>Volume[x]RaidDisk[y]Port, x:0~1, y:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidDisk[y]Port].stVal.Value, x:0~1, y: 0~4	Value	Integer		The disk port number on the managed device. The ranges of this value from 0 to the port number of disk on the managed device.
<b>Volume[x]RaidDisk[y]SerialNumber, x:0~1, y:0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidDisk[y]SerialNumber].stVal.Value, x:0~1, y: 0~4	Value	String		The unique serial number of each disk.
<b>Volume[x]RaidDisk[y]Status, x:0~1, y: 0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidDisk[y]Status].stVal.Value, x:0~1, y: 0~4	0, 1, 2	Integer		The disk Status in specific RAID. If the RAID disk status is not ok, '0' is returned. If the RAID disk is working properly, '1' is returned. If the RAID disk status is missing, '2' is returned.
<b>Volume[x]RaidDisk[y]VolumeName, x:0~1, y: 0~4</b>	IEC61850.DA820C_S1.DA820CC1. [LPHD1\$ST\$Volume[x]RaidDisk[y]VolumeName].stVal.Value, x:0~1, y: 0~4	Value	String		The RAID volume name of the RAID disk.



## NOTE

- Tag name **LogicProcessor[x]Usage** may vary based on the actual logic processor (e.g., LogicProcessor1Usage, LogicProcessor2Usage, etc.).
- Tag name **Disk[x]SlotStatus, Disk[x]Port, Disk[x]HealthStatus, Disk[x]SerialNumber, and Disk[x]AvgEraseCount** may vary based on the physical disk slot number (e.g., Disk0SlotStatus, Disk0Port, Disk0HealthStatus, Disk0SerialNumber, Disk0AvgEraseCount).
- Tag name **PartitionUsage, PartitionTotalSize, and PartitionAvailableSize** may vary based on the disk partition A to Z (e.g., PartitionAUsage, PartitionATotalSize, PartitionAAvailableSize).
- Tag name **Volume[x]RaidMode, Volume[x]RaidRedundancyStatus, and Volume[x]RaidVolumeName** may vary based on the RAID volume created (e.g., Volume0RaidMode, Volume0RaidRedundancyStatus, Volume0RaidVolumeName).
- Tag name **Volume[x]RaidDisk[y]Port, Volume[x]RaidDisk[y]SerialNumber, Volume[x]RaidDisk[y]Status, and Volume[x]RaidDisk[y]VolumeName** may vary based on the disk slot of the RAID volume and RAID volume (e.g., Volume0RaidDisk0Port, Volume0RaidDisk0SerialNumber, Volume0RaidDisk0Status, Volume0RaidDisk0VolumeName).



- **LPCP:** Serial port status of onboard and expansion card are included in this node. The details of the LPCP data objects are listed here.

Tag Name	Path	Comment	Data Format	Description
<b>SerialPortFriendlyName</b>	IEC61850.DA820C_S1.DA820CC1.[LPCP[x]\$ST\$SerialPortFriendlyName].stVal.Value, x:1~32	Value	String	The serial port friendly name on the managed device.
<b>SerialPortStatus</b>	IEC61850.DA820C_S1.DA820CC1.[LPCP[x]\$ST\$SerialPortStatus].stVal.Value, x:1~32	0, 1	Integer	The serial port status of managed device. If the serial port is available, the value 'available(0)' is returned. If the serial port is in use, the value 'inuse(1)' is returned.



## NOTE

The Path information listed in the table may vary based on the serial port used (e.g., LPCP1\$ST\$SerialPortFriendlyName.stVal.Value, LPCP2\$ST\$SerialPortFriendlyName.stVal.Value, etc.).

- **LCCH:** Network adapter status of onboard and expansion card are included in this node. The details of the LCCH data objects are listed here.

Tag Name	Path	Comment	Data Format	Range	Description
<b>AdapterFriendlyName</b>	IEC61850.DA820C_S1.DA820CC1.[LCCH[x]\$ST\$AdapterFriendlyName].stVal.Value, x:1~12	Value	String		The network adapter friendly name on the managed device.
<b>LinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.[LCCH[x]\$ST\$LinkStatus].stVal.Value	0, 1	Integer		The network connection status. If the network cable unplugged, the value 'disconnected(0)' is returned. If the network cable plugged, the value 'connected(1)' is returned.
<b>Speed</b>	IEC61850.DA820C_S1.DA820CC1.[LPHD[x]\$ST\$Speed].stVal.Value, x:1~12	Value	Integer		The current network link speed. The unit of value is 'M'. Represent its status to '10M' or '100M' and '1000M'.
<b>Utilization</b>	IEC61850.DA820C_S1.DA820CC1.[LCCH[x]\$ST\$Utilization].stVal.Value, x:1~12	Value	Integer	0 to 100	The current network utilization. The ranges of utilization from 0(%) to 100(%).



## NOTE

The Path information listed in the table may vary based on the network adapter (e.g., LCCH1\$ST\$AdapterFriendlyName.stVal.Value, LCCH2\$ST\$AdapterFriendlyName.stVal.Value, etc.).

- **LPIT:** PRP/HSR status of expansion card is included in this node. The details of the LPIT data objects are listed here.

Tag Name	Path	Comment	Data Format	Description
<b>AdapterPort</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterPort].stVal.Value, x:1~3	Value	Integer	Physical network adapter port number of PRP/HSR expansion card. System will assign the port number of PRP/HSR behind the onboard network adapter. The port number order decided by system PCI bus location.
<b>AdapterFriendly Name</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterFriendlyName].stVal.Value, x:1~3	Value	String	Device name of PRP/HSR expansion card network adapter on Windows Device Manager.
<b>AdapterNetConnectionID</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterNetConnectionID].stVal.Value, x:1~3	Value	String	Connection name of PRP/HSR expansion card network adapter.
<b>AdapterIPAddress</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterIPAddress].stVal.Value, x:1~3	Value	String	IP address of PRP/HSR expansion card network adapter.
<b>AdapterMACAddress</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterMACAddress].stVal.Value, x:1~3	Value	String	MAC address of PRP/HSR expansion card network adapter.
<b>AdapterMode</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterMode].stVal.Value, x:1~3	1, 2	Integer	The current mode of PRP/HSR expansion card network adapter. If the PRP/HSR expansion card mode is set to PRP mode, '1' is returned. If the PRP/HSR expansion card mode is set to HSR mode, '2' is returned.
<b>AdapterSpeed</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterSpeed].stVal.Value, x:1~3	Value	Integer	The current network link speed. The unit of value is 'M'. Represent its status to '10M' or '100M' and '1000M'.
<b>AdapterLinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$AdapterLinkStatus].stVal.Value, x:1~3	0, 1	Integer	The network connection status of PRP/HSR expansion card. If the expansion card doesn't work, the value 'disconnected(0)' is returned. If the expansion card work properly, the value 'connected(1)' is returned.
<b>PrpHsrLanALinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanALinkStatus].stVal.Value, x:1~3	0, 1	Integer	Current connection status of LAN A. If the network cable unplugged, the value 'disconnected(0)' is returned. If the network cable plugged, the value 'connected(1)' is returned.
<b>PrpHsrLanASpeed</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanASpeed].stVal.Value, x:1~3	Value	Integer	Current speed of LAN A of PRP/HSR expansion card. The unit of value is 'M'. Represent its status to '100M' and '1000M'.
<b>PrpHsrLanAGoodOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanAGoodOctets].stVal.Value, x:1~3	Value	Integer	Rx good octets of LAN A.
<b>PrpHsrLanAErrOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanAErrOctets].stVal.Value, x:1~3	Value	Integer	Rx error octets of LAN A.

Tag Name	Path	Comment	Data Format	Description
<b>PrpHsrLanARx Wrong</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanARxWrong].stVal.Value, x:1~3	Value	Integer	Rx wrong octets of LAN A.
<b>PrpHsrLanARxDuplicate</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanARxDuplicate].stVal.Value, x:1~3	Value	Integer	Rx duplicate octets of LAN A.
<b>PrpHsrLanATxOctets</b>	IEC61850.DA820C_S1.DA820CC1.LPIT[x]\$ST\$PrpHsrLanATxOctets].stVal.Value, x:1~3	Value	Integer	Tx octets of LAN A.
<b>PrpHsrLanBLink Status</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBLinkStatus].stVal.Value, x:1~3	0, 1	Integer	Current connection status of LAN B. If the network cable unplugged, the value 'disconnected(0)' is returned. If the network cable plugged, the value 'connected(1)' is returned.
<b>PrpHsrLanBSpeed</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBSpeed].stVal.Value, x:1~3	Value	Integer	Current speed of LAN B of PRP/HSR expansion card. The unit of value is 'M'. Represent its status to '100M' and '1000M'.
<b>PrpHsrLanBGoodOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBGoodOctets].stVal.Value, x:1~3	Value	Integer	Rx good octets of LAN B.
<b>PrpHsrLanBErrOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBErrOctets].stVal.Value, x:1~3	Value	Integer	Rx error octets of LAN B.
<b>PrpHsrLanBRx Wrong</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBRxWrong].stVal.Value, x:1~3	Value	Integer	Rx wrong octets of LAN B.
<b>PrpHsrLanBRxDuplicate</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBRxDuplicate].stVal.Value, x:1~3	Value	Integer	Rx duplicate octets of LAN B.
<b>PrpHsrLanBTxOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrLanBTxOctets].stVal.Value, x:1~3	Value	Integer	Tx octets of LAN B.
<b>PrpHsrInterlink LinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrInterlinkLinkStatus].stVal.Value, x:1~3	0, 1	Integer	Current connection status of Interlink. If the network cable unplugged, the value 'disconnected(0)' is returned. If the network cable plugged, the value 'connected(1)' is returned.
<b>PrpHsrInterlink GoodOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrInterlinkGoodOctets].stVal.Value, x:1~3	Value	Integer	Rx good octets of InterLink.
<b>PrpHsrInterlink ErrOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrInterlinkErrOctets].stVal.Value, x:1~3	Value	Integer	Rx error octets of InterLink.
<b>PrpHsrInterlink RxWrong</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrInterlinkRxWrong].stVal.Value, x:1~3	Value	Integer	Rx wrong octets of InterLink
<b>PrpHsrInterlink RxDuplicate</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrInterlinkRxDuplicate].stVal.Value, x:1~3	Value	Integer	Rx duplicate octets of InterLink.
<b>PrpHsrInterlink TxOctets</b>	IEC61850.DA820C_S1.DA820CC1.[LPIT[x]\$ST\$PrpHsrInterlinkTxOctets].stVal.Value, x:1~3	Value	Integer	Tx octets of InterLink.



## NOTE

The Path information listed in the table may vary based on the expansion card (e.g., LPIT1\$ST\$AdapterFriendlyName.stVal.Value, LPIT2\$ST\$AdapterFriendlyName.stVal.Value, etc.).

# DataSets

The ICD file organizes data objects related to a logical node in a collection.

- **LLN0\$CpuSt:** Collection of CPU related statuses in the LPHD logical node.

Tag Name	Path
<b>CpuUsage</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$CpuSt][LPHD1\$ST\$CpuUsage].stVal.Value
<b>CpuTemperature</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$CpuSt][LPHD1\$ST\$CpuTemperature].stVal.Value
<b>CpuVolt</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$CpuSt][LPHD1\$ST\$CpuVolt].stVal.Value
<b>CpuLogicCount</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$CpuSt][LPHD1\$ST\$CpuLogicCount].stVal.Value
<b>LogicProcessor[x]Usage, x:1~8</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$CpuSt][LPHD1\$ST\$LogicProcessor[x]Usage].stVal.Value, x:1~8

- **LLN0\$MemSt:** Collection of memory related status in the LPHD logical node.

Tag Name	Path
<b>MemVolt</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MemSt][LPHD1\$ST\$MemVolt].stVal.Value
<b>MemUsg</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MemSt][LPHD1\$ST\$MemUsg].stVal.Value
<b>MemTotalSize</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MemSt][LPHD1\$ST\$MemTotalSize].stVal.Value
<b>MemAvailSize</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MemSt][LPHD1\$ST\$MemAvailSize].stVal.Value

- **LLN0\$MainboardSt:** Collection of mainboard related status in the LPHD logical node.

Tag Name	Path
<b>MainboardTemperature</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MainboardSt][LPHD1\$ST\$MainboardTemperature].stVal.Value
<b>MainboardVolt</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MainboardSt][LPHD1\$ST\$MainboardVolt].stVal.Value
<b>MainboardPwr1Up</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MainboardSt][LPHD1\$ST\$MainboardPwr1Up].stVal.Value
<b>MainboardPwr2Up</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MainboardSt][LPHD1\$ST\$MainboardPwr2Up].stVal.Value
<b>MainboardPowerIndicator</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$MainboardSt][LPHD1\$ST\$MainboardPowerIndicator].stVal.Value

- **LLN0\$DiskSt:** Collection of disk related status in the LPHD logical node.

Tag Name	Path
<b>Disk[x]SlotStatus, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$DiskSt] [LPHD1\$ST\$Disk[x]SlotStatus].stVal.Value, x:0~4
<b>Disk[x]Port, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$DiskSt] [LPHD1\$ST\$Disk[x]Port].stVal.Value, x:0~4
<b>Disk[x]HealthStatus, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$DiskSt] [LPHD1\$ST\$Disk[x]HealthStatus].stVal.Value, x:0~4
<b>Disk[x]SerialNumber, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$DiskSt] [LPHD1\$ST\$Disk[x]SerialNumber].stVal.Value, x:0~4
<b>Disk[x]AvgEraseCount, x:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$DiskSt] [LPHD1\$ST\$Disk[x]AvgEraseCount].stVal.Value, x:0~4

- **LLN0\$RaidSt:** Collection of RAID related status in the LPHD logical node.

Tag Name	Path
<b>Volume[x]RaidMode, x:0~1</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidSt] [LPHD1\$ST\$Volume[x]RaidMode].stVal.Value, x:0~1
<b>Volume[x]RaidRedundancyStatus, x:0~1</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidSt] [LPHD1\$ST\$Volume[x]RaidRedundancyStatus].stVal.Value, x:0~1
<b>Volume[x]RaidVolumeName, x:0~1</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidSt] [LPHD1\$ST\$Volume[x]RaidVolumeName].stVal.Value, x:0~1

- **LLN0\$RaidDiskSt:** Collection of RAID disk related status in the LPHD logical node.

Tag Name	Path
<b>Volume[x]RaidDisk[y]Port, x:0~1, y:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidDiskSt] [LPHD1\$ST\$Volume[x]RaidDisk[y]Port].stVal.Value, x:0~1, y:0~4
<b>Volume[x]RaidDisk[y]SerialNumber, x:0~1, y:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidDiskSt] [LPHD1\$ST\$Volume[x]RaidDisk[y]SerialNumber].stVal.Value, x:0~1, y:0~4
<b>Volume[x]RaidDisk[y]Status, x:0~1, y:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidDiskSt] [LPHD1\$ST\$Volume[x]RaidDisk[y]Status].stVal.Value, x:0~1, y:0~4
<b>Volume[x]RaidDisk[y]VolumeName, x:0~1, y:0~4</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$RaidDiskSt] [LPHD1\$ST\$Volume[x]RaidDisk[y]VolumeName].stVal.Value, x:0~1, y:0~4

- **LLN0\$PartitionSt:** Collection of partition related status in the LPHD logical node.

Tag Name	Path
<b>Partition[x]Usage, x:A~Z</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PartitionSt] [LPHD1\$ST\$Partition[x]Usage].stVal.Value, x:A~Z
<b>Partition[x]TotalSize, x:A~Z</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PartitionSt] [LPHD1\$ST\$Partition[x]TotalSize].stVal.Value, x:A~Z
<b>Partition[x]AvailableSize, x:A~Z</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PartitionSt] [LPHD1\$ST\$Partition[x]AvailableSize].stVal.Value, x:A~Z

- **LLN0\$EthSt:** Collection of network related status in the LCCH logical node.

Tag Name	Path
<b>AdapterFriendlyName</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$EthSt] [LCCH[x]\$ST\$AdapterFriendlyName].stVal.Value, x:1~12
<b>LinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$EthSt] [LCCH[x]\$ST\$LinkStatus].stVal.Value, x:1~12
<b>Speed</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$EthSt] [LCCH[x]\$ST\$Speed].stVal.Value, x:1~12
<b>Utilization</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$EthSt] [LCCH[x]\$ST\$Utilization].stVal.Value, x:1~12

- **LLN0\$PRPHSRSt**: Collection of PRP/HSR related status in the LPIT logical node.

Tag Name	Path
<b>AdapterPort</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterPort].stVal.Value, x:1~3
<b>AdapterFriendlyName</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterFriendlyName].stVal.Value, x:1~3
<b>AdapterNetConnectionID</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterNetConnectionID].stVal.Value, x:1~3
<b>AadapterIPAddress</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AadapterIPAddress].stVal.Value, x:1~3
<b>AdapterMACAddress</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterMACAddress].stVal.Value, x:1~3
<b>AdapterMode</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterMode].stVal.Value, x:1~3
<b>AdapterSpeed</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterSpeed].stVal.Value, x:1~3
<b>AdapterLinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$AdapterLinkStatus].stVal.Value, x:1~3
<b>PrpHsrLanALinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanALinkStatus].stVal.Value, x:1~3
<b>PrpHsrLanASpeed</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanASpeed].stVal.Value, x:1~3
<b>PrpHsrLanAGoodOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanAGoodOctets].stVal.Value, x:1~3
<b>PrpHsrLanAErrOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanAErrOctets].stVal.Value, x:1~3
<b>PrpHsrLanARxWrong</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanARxWrong].stVal.Value, x:1~3
<b>PrpHsrLanARxDuplicate</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanARxDuplicate].stVal.Value, x:1~3
<b>PrpHsrLanATxOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanATxOctets].stVal.Value, x:1~3
<b>PrpHsrLanALinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanALinkStatus].stVal.Value, x:1~3
<b>PrpHsrLanBSpeed</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanBSpeed].stVal.Value, x:1~3
<b>PrpHsrLanBGoodOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanBGoodOctets].stVal.Value, x:1~3
<b>PrpHsrLanBErrOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanBErrOctets].stVal.Value, x:1~3
<b>PrpHsrLanBRxWrong</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanBRxWrong].stVal.Value, x:1~3
<b>PrpHsrLanBRxDuplicate</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanBRxDuplicate].stVal.Value, x:1~3
<b>PrpHsrLanBTxOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrLanBTxOctets].stVal.Value, x:1~3
<b>PrpHsrInterlinkLinkStatus</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrInterlinkLinkStatus].stVal.Value, x:1~3
<b>PrpHsrInterlinkGoodOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrInterlinkGoodOctets].stVal.Value, x:1~3
<b>PrpHsrInterlinkErrOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrInterlinkErrOctets].stVal.Value, x:1~3
<b>PrpHsrInterlinkRxWrong</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrInterlinkRxWrong].stVal.Value, x:1~3
<b>PrpHsrInterlinkRxDuplicate</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrInterlinkRxDuplicate].stVal.Value, x:1~3
<b>PrpHsrInterlinkTxOctets</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$PRPHSRSt][LPIT[x]\$ST\$PrpHsrInterlinkTxOctets].stVal.Value, x:1~3

- **LLN0\$SerialSt:** Collection of serial port related status in the LPCP logical node.

Tag Name	Path
<b>SerialPortFriendlyName</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$SerialSt] [LPCP[x]\$ST\$SerialPortFriendlyName].stVal.Value, x:1~32
<b>SerialPortStatus</b>	IEC61850.DA820C_S1.DA820CC1.DataSets.[LLN0\$SerialSt] [LPCP[x]]\$ST\$SerialPortStatus].stVal.Value, x:1~32