

# Introduction

The SOFREL OPC UA server **centralizes all data** for a network of SOFREL devices (remote terminal units and/or data loggers) and relays these data to the **OPC clients of SCADA** using the **OPC UA 1.04 Server** standard with Data Access profile (IEC 62541).

The SOFREL OPC UA server communicates with SOFREL telemetry devices via the LACBUS-RTU protocol **over IP** and includes computer security mechanisms.

## 1 Installation

The SOFREL OPC UA server is provided in the form of an **executable application** (EXE file).

The client and server can thus be installed on different machines (physical or virtual).

### 1.1 Case of a physical machine

The SOFREL OPC UA server runs on compatible "64-bit" Windows OSs (see Windows compatibility table).

### 1.2 Case of a virtual machine

The SOFREL OPC UA server can run on a compatible virtual machine (see Windows compatibility table).



The virtual machine host environment must be **dedicated to Telemetry** and must be equipped with **uninterruptible power supply**.

### 1.3 License protection

The number of sites managed by the OPC UA server is defined by a software protection key issued by LACROIX Sofrel; this key must be installed on the server unit.

### 1.4 Remote update of DL configurations

The OPC UA server integrates a remote update function of the data logger configurations (for DLs in version V5.10.14 at least).

For each Data Logger needing a configuration update, the user must:

- Generate from SOFTTOOLS the configuration file to be sent to the DL (Refer to the online help of the Data Loggers in SOFTTOOLS for the generation of the export file ".lx") <sup>(1)</sup>
- Drop this file **in the "DLUpdate" sub-directory** of the installation tree of the OPC UA server.  
For example : C:\Program Files\Lacroix Sofrel\Sofrel OPC UA Server\DLUpdate

(1) SOFTTOOLS produces the configuration file to be sent to a DL with:

- The appropriate format for transfer without interpretation by the OPC UA server
- The predefined name « **NNNNN StationName.lx** » where:
  - "StationName" is the label of the Station in SOFTTOOLS,
  - "NNNNN" is the site number of the Data Logger,

The Sofrel OPC UA server uses the file name to determine the recipient DL. The user must therefore modify the name predefined by SOFTTOOLS to include **the full site number** or **serial number of the DL** <sup>(2)</sup>

- **Site number:** The file name must begin with Site Number in the form NNNNNN or NNNNNN-xxxx-yyyy possibly followed by a text prefixed obligatorily by a space ' '. The non-significant '0's as in '00012' are not required. If the identification codes xxxx and yyyy are not filled in, they are forced to 0. Examples: '132-10-25 Vern.lx' or '132 Vern.lx' or '132.lx'.
- **Serial number:** The file name must start with the software serial number (this number is written on the the case label) in the form VVAAAZZZZZZZZ followed by a prefixed text, if necessary, must be indicated by a space ' '. Examples : '0191100352 Vern.lx' or '191100352.lx'

(2) According the identification method of the equipment by the OPC UA server (see parameter 'IdentifyBySerialNumber' - § 3.1.5)

## 2 Description of the configuration

### 2.1 XML file

The configuration of the SOFREL OPC UA server is described in the "**SofrelOPCUAServer.xml**" file located in the "**\Configuration**" folder of the server installation directory. Comments in XML format can be inserted into the file: **<!-- Comment -->**.

Configuring the SOFREL OPC UA server consists in editing the XML file to define:

- the general operating parameters,
- the devices and their communication media.

### 2.2 Description of the tree structure

Tag	Significance
SofrelOPCUAServer	Root tag
Parameters	Server global configuration parameters
Endpoints	List of server access points
Endpoint	Description of a server access point
UserIdentityToken	Description of authorised identification methods
Clients	Description of the list of identified clients of the server
ClientId	Description of an identified client of the server
IPAddresses	Description of the list of IP addresses to test via a Ping
IPAddress	Description of an IP address to test via a Ping
Equipment	Description of a device
Links	List of the device's communication media
Link	Device communication medium

### 2.3 Configuration examples

Several XML file examples are provided in the "\Configuration\Examples" folder of the SOFREL OPC UA server installation directory.

### 2.4 Dynamic configuration

Periodically, the SOFREL OPC UA server analyses the contents of the configuration file to take any additional devices into account.



Only effective device additions are taken into consideration.

A SOFREL OPC UA server reboot is required:

- If a device is modified or deleted,
- If the global configuration parameters are changed.

## 3 Configuration parameters

The following paragraphs describe the main parameters for conventional use.



In the following tables, the "✓" indicates that the parameter is required, while the "Ø" symbol indicates that the parameter is optional.

### 3.1 General parameters

The general parameters are described in the attributes associated with the **"Parameters"** tag. All of these parameters are optional.

Tag	Significance	Authorised value	Default value
AckAlarm	Acknowledgement of RTU alarms	True or False	True
AlternativeDomains	Alternative names to add to server certificate	IP addresses in 'decimal number' format or in 'literal' form separated by ;	Empty string
AuthenticationMethod	Authentication with RTUs	Authority, Challenge, Password, None	None
HistoNotifDelay	Notification of HValue item samples	50 to 60000 (delay in ms)	1000 ms
IdentifiyBySerialNumber	Identification of the calling device by its serial number	True: by serial no., False: by address	False
IPTestPeriod	Periodic IP link test (IP-Fault assessment)	1 to 99999	60 s
MaxClientConnection	Maximum number of simultaneous OPC UA client connexions	1 to 100	4
MaxHistoFrames	Maximum number of archive messages acquired during communication with an RTU	1 to 250	100
MaxIncomingIPConnection	Maximum number of simultaneous incoming IP connections	1 to 1000	50
MaxOutgoingIPConnection	Maximum number of simultaneous outgoing IP connections	1 to 200	10
MaxSessionTimeout	Maximum timeout for an OPC UA client session	60 000 to 3 600 000	600 000 ms
PCNumber	Number of PC used for outgoing call to an RTU	1 to 4	1
PortNumber	Modbus TCP port (no TLS) used for incoming and outgoing calls	1 to 65535	502
PortNumberSecure	Modbus TCP port (with TLS) used for incoming and outgoing calls	1 to 65535	802
Redundancy	Use of redundancy	True or False	False
RestartOnConfigurationReceived	Automatic restart of the OPC UA server upon receipt of a device configuration	True or False	True
SetDateTime	Device time setting	True or False	True
TraceLevel	Trace level used to write to LOG files	Error, Warning, Information, Verbose.	Warning
BadQualityOnCommunicationFailure	On communication failure, the Sofrel OPC UA server forces the status to BAD for all items of the equipment.	True : force to BAD, False : do nothing	False
SaveContextDelay	Time period between two context backups in minutes.	0 à 1440	5

### 3.1.1 Endpoint tag

The access point parameters are described in the attributes associated with the "Endpoint" tag.

Tag	Fees	Significance	Values
MessageSecurityMode	✓	The message security mode indicates the manner in which the messages exchanged between SOFREL OPC UA server and SCADA are protected.	None Sign SignAndEncrypt
SecurityPolicy	✓	The security policy indicates the method used to protect exchanges.	None Basic256 Basic256Sha256
TransportProfile	✓	The transport profile defines a combination of network protocol, security protocol and message encoding. This protocol enables SCADA to communicate with the SOFREL OPC UA server.	UA-Binary

### 3.1.2 UserIdentityToken tag

Tag	Fees	Significance	Values	Default value
Type	✓	The identification method indicates the manner in which the SCADA must identify themselves to the SOFREL OPC UA server.	Anonymous UserName	UserName

### 3.1.3 ClientId tag

The identified client parameters are presented in the following table:

Tag	Fees	Significance	Values	Default value
Name	✓	Name associated with the client for the item tree. Must not be blank and must be unique relative to the other identified clients.	Characters in the range [a-z] [A-Z] [0-9] - and _	None
Password	∅	Password if the client authenticates itself with the 'UserName' identification token.	Unrestricted characters	Not defined
Redundancy	∅	Redundancy usage indicator overload for this client.	True or False	Value of 'Parameters. Redundancy'
UserIdentityToken	✓	The identification token indicates the manner in which this client must identify itself to the SOFREL OPC UA server.	'UserName'	None
UserName	∅	User name if the client authenticates itself with the 'UserName' identification token.	Unrestricted characters	Not defined



The presence of 'Password' and 'UserName' attributes becomes required according to the value of 'UserIdentityToken'.

### 3.1.4 IP Addresses tag

This tag contains the list of IP addresses used to assess the IP fault.

Tag	Fees	Significance	Values	Default value
IPAddress	Ø	IP address in 'decimal number' format or in 'literal' form.	Unrestricted characters	None

### 3.1.5 Equipment tag

Each RTU / DL is described in its own "Equipment" tag.

Tag	Fees	Significance	Values	Default value
AckAlarm	Ø	Alarm acknowledgement indicator overload for this device.	True or False	Value of Parameters. AckAlarm
Address	✓	Device address in the form "SiteNo/IDCode1/IDCode2".	"[0-65535]/[0-9999]/[0-9999]"	"0/0/0"
AuthenticationMethod	Ø	Overload of the authentication method used to connect to this device.	Authority, Challenge, Password, None	Value of Parameters. AuthenticationMethod
Name	✓	Device name used for the OPC item tree. Must not be blank and must be unique relative to the other devices.	Characters in the range [a-z] [A-Z] [0-9] - and _	None
Password	Ø	Password used for authentication.	Unrestricted characters	Not defined
PCNumber	Ø	Overload of the PC number that the SOFREL OPC UA server uses to poll this device.	1, 2, 3 or 4	Value of Parameters. PCNumber
SerialNumber	✓	Device serial number.	From 1 to 9999999999999999	1
SetDateTime	Ø	Time set indicator overload for this device.	True or False	Value of Parameters. SetDateTime
Type	✓	Type of device.	S500, AS, S4 or DL	None



Only the presence of either of the 'Address' or 'SerialNumber' attributes is required according to the value of the 'IdentifyBySerialNumber' parameter.

### 3.1.6 Link tag

Each medium is defined via a "Link" sub-tag of "Links", arranged in the order of use by the SOFREL OPC UA server.

Tag	Fees	Significance	Values	By default
IPAddress	✓	Decimal or literal IP address of the device, which may also include the IP port to use.	Unrestricted characters	Not defined
MinimumCommunicationInterval	Ø	Wait time, in seconds, relative to the last correct communication with the device, before authorising the establishment of a communication over this link.	0 to 65535	0
NbCommTry	Ø	Number of complete communication attempts over this medium before considering that communication over this medium is impossible.	1 to 10	3

## 4 Server functions

### 4.1 General points

The SOFREL OPC UA server is based on the **OPC UA 1.04 Server standard** with a Data Access profile. It is provided in the form of a Windows service and is compatible with multi-client architectures.

#### 4.1.1 Functions available for OPC UA clients

The server offers the following functions to OPC UA clients:

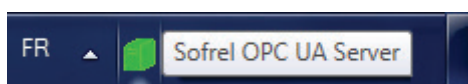
- Browsing of items available on the server (Browser),
- Access to acquired data (current data statuses, time-stamped values, operating parameters),
- Issuing of setpoints,
- Communication management (communication initiation, maintenance and termination, current communication indicator),
- Access to communication link control data.





#### 4.1.2 Starting and stopping the SOFREL OPC UA server

The SOFREL OPC UA server is automatically activated when Windows starts, and stopped when Windows is shut down.

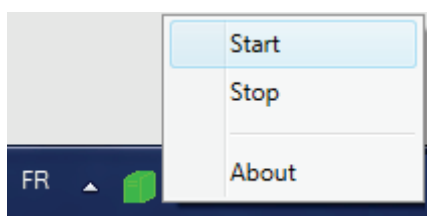
A software watchdog restarts the SOFREL OPC UA server in the event of failure of this latter.

An application in the Windows system tray displays the current status of the SOFREL OPC UA server.



-  This icon indicates that the SOFREL OPC UA server is running.
-  This icon indicates that the SOFREL OPC UA server is stopped.
-  This icon indicates that the SOFREL OPC UA server is changing state.
-  This icon indicates that the status of the SOFREL OPC UA server is unknown.

Right-clicking this application displays a context-sensitive menu.



If the user logged onto Windows possesses Administrator privileges:

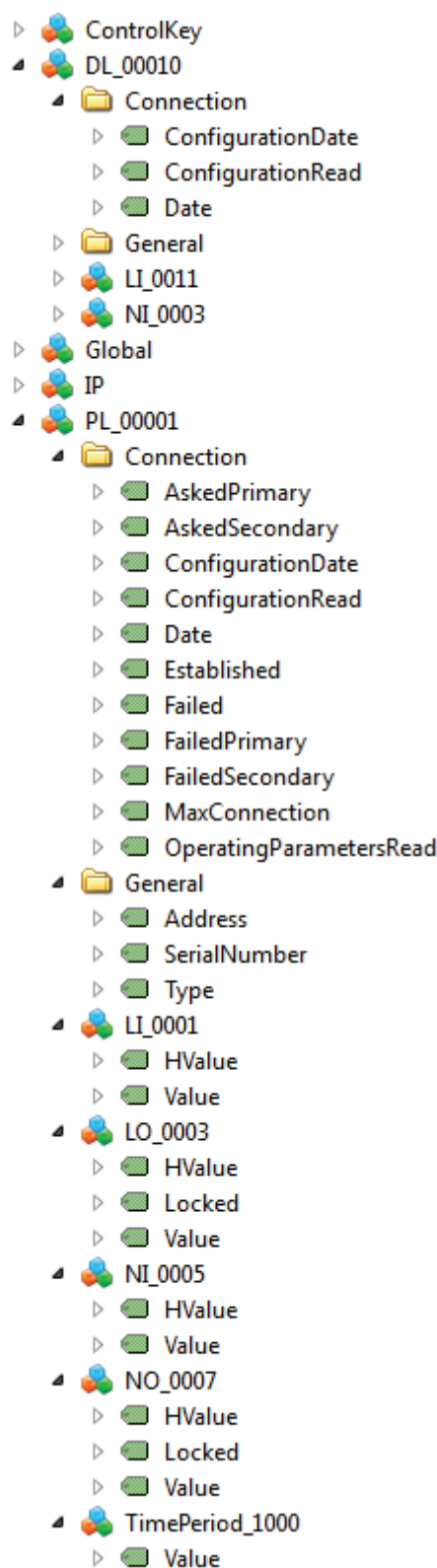
- Clicking on Start starts the SOFREL OPC UA server,
- Clicking on Stop shuts down the SOFREL OPC UA server,

#### 4.1.3 Data to back up/to purge

With the exception of the SOFREL OPC UA server configuration, no backup is necessary. Similarly, no purges are required to ensure correct SOFREL OPC UA server operation.

#### 4.1.4 Tree structure view of an OPC UA client

The features are available via items organised according to the tree structure described below:



### 4.1.5 Data values

The following table indicates the maximum number of data per data type according to device type:

Device type	LI	NI	LO	NO	TimePeriod	UniversalPeriod
<b>S4</b>	2000	2000	2000	2000	25	20
<b>S500 / AS</b>	1000	1000	1000	1000	25	25
<b>LS / LT</b>	100	100	0	0	0	0

Each device data is represented by a single item named XX\_nnnn, where:

- XX is the data type (LI, NI, LO, NO, TimePeriod, or UniversalPeriod),
- nnnn is the data number (0001 to 2000).

The data values are accessible via the following sub-items:

- Value, containing the current data status,
- HValue, containing the time-stamped values,
- Locked, containing the lock.

### 4.1.6 Item quality

When an OPC UA client subscribes to an item and when no value has been received, the SOFREL OPC UA server notifies this by setting the item quality to Bad.

This indicator is switched to Good as soon as a value is effectively received.

When stopped, the SOFREL OPC UA server keeps an image of its items. When it boots, the quality indicator of all items for which at least one value has been received is set to Good.

#### Captions

R:	Read (access in read mode only)
R / W:	Read/Write (access in read and write mode)
Boolean:	Boolean
String:	Character string (UTF-8 encoding)
DateTime:	Date (type WIN32 FILETIME)
Float:	Floating point number over 4 bytes
Double:	Floating point number over 8 bytes (double precision)
UInt16:	Unsigned integer over 2 bytes
UInt32:	Unsigned integer over 4 bytes
UInt64:	Unsigned integer over 8 bytes



The following tables summarise the main items used.



## 4.2 Main items

### 4.2.1 ControlKey

Item name	Type	Access	Significance	Default value
Exist	Boolean	R	Protection key: Presence	False
ExpiryDate	DateTime	R	Protection key: Deadline	Server launch time stamp + 1 hour
MaxNumberOfTelecontrolRTU	UInt16	R	Protection key: Max. number of RTUs	1
MaxNumberOfDataLogger	UInt16	R	Protection key: Max. number of DLs	1
MaxVersionNumber	String	R	Protection key: Max. major executable version	Major version of the installed executable
NumberOfTelecontrolRTU	UInt16	R	No. of configured RTUs	0
NumberOfDataLogger	UInt16	R	No. of configured DLs	0

### 4.2.2 Global

Item name	Type	Access	Significance	Default value
CfgError	Boolean	R	Configuration file read error	False
CfgReceived	Boolean	R	New configuration received for a device	False

### 4.2.3 IP communication

Item name	Type	Access	Significance	Default value
Failed	Boolean	R	IP fault (internal datum)	True

## 4.2.4 Devices

### 4.2.4.1 Communication control

The name of each item is preceded by "<Device\_name>.Connection.» :

Item name	Type	Access	S500, AS, S4	DL	Significance
AskedPrimary	Boolean	R/W	✓		Connection request to device over primary medium (0 to 1) or immediate hang-up without acquiring all data (1 to 0)
AskedSecondary	Boolean	R/W	✓		Connection request to device over secondary medium (0 to 1) or immediate hang-up without acquiring all data (1 to 0)
ConfigurationDate	DateTime	R	✓	✓	Configuration update date.
ConfigurationRead	Boolean	R / W	✓	✓	Configuration parameters read request.
Date	DateTime	R	✓	✓	Start date and time of the current communication or end date and time of the last communication.
Established	Boolean	R	✓		Communication in progress
Failed	Boolean	R	✓		Result of the last communication attempt: 1: failure, 0: success.
FailedPrimary	Boolean	R	✓		Result of the last communication attempt over primary medium: 1: failure, 0: success.
FailedSecondary	Boolean	R	✓		Result of the last communication attempt over secondary medium: 1: failure, 0: success.
MaxConnection	UInt16	R/W	✓		Maximum connection time in seconds for maintained connection. The initial value of 0 seconds corresponds to a non-maintained communication; this item is reset to 0 after each communication.
OperatingParametersRead	Boolean	R/W	✓		Operating parameters read request.

### 4.2.4.2 Device description

The name of each item is preceded by <Device\_name>.General.» :

Item name	Type	Access	S500, AS, S4	DL	Significance
Address	String	R	✓	✓	Address of the device in the LACBUS-RTU protocol, in the form "Site no./Identification Code 1/Identification Code 2"
SerialNumber	UInt64	R	✓	✓	Device serial number.
Type	String	R	✓	✓	Device type: S500, AS, S4 or DL.

#### 4.2.4.3 LACBUS-RTU device telemetry data

The name of each item is preceded by "<Device\_name>":

Type of data	Item name	Type	Access	S500, AS, S4	DL	Significance
Logical input	LI_XXXX.Value	Boolean	R	✓	✓	Logical input value
	LI_XXXX.HValue	Boolean	R	✓	✓	Logical input time-stamped value
Digital input	NI_XXXX.Value	Double	R	✓	✓	Digital input value
	NI_XXXX.HValue	Double	R	✓	✓	Digital input time-stamped value
Logical output	LO_XXXX.Value	Boolean	R/W	✓		Logical output value
	LO_XXXX.Locked	Boolean	R/W	✓		Logical output locking
	LO_XXXX.HValue	Boolean	R	✓		Logical output time-stamped value
Digital output	NO_XXXX.Value	Double	R/W	✓		Digital output value
	NO_XXXX.Locked	Boolean	R/W	✓		Digital output locking
	NO_XXXX.HValue	Double	R	✓		Digital output time-stamped value
Operating parameters	TimePeriod_XXXX.Value	String	R/W	✓		Weekly period value (*)
	UniversalPeriod_XXXX.Value	String	R/W	✓		Universal period value (**)



(\*) : The item represents the 28 time periods (4 periods per day, starting on Monday and ending on Sunday) in the format "start hour/minute - end hour/minute" as follows:

hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn;  
 hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn;  
 hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn;  
 hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn;  
 hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn;  
 hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn;  
 hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn, hh:mn-hh:mn

(\*\*) : The item represents a start date and an end date in the format  
 "start day/month hour:minute – end day/month hour:minute" as follows:  
 dd/mo hh:mn-dd/mo hh:mn

## 4.3 Network telemetry

### 4.3.1 Polling control

In the following sub-chapters, the name of each item is preceded by "<Device\_name>.Connection." (except for output data).

### 4.3.2 Polling triggering

An OPC UA client triggers polling of a device by writing to one of the following device-associated items.

Item name	Type	Access	Action
AskedPrimary	Boolean	R/W	Communication triggered over the primary medium then, in the event of failure, over the secondary medium if the timer between two triggering events over this medium has not elapsed.
AskedSecondary	Boolean	R/W	Communication triggered over the secondary medium if the timer between two triggering events over this medium has not elapsed.
ConfigurationRead	Boolean	R/W	Communication triggered to read the configuration parameters.
MaxConnection	UInt16	R/W	Communication triggered until expiry of the time specified with the call and transmission of data available in the device.
OperatingParametersRead	Boolean	R/W	Communication triggered to read the operating parameters and to transmit the data available in the device.
Value	Boolean Double String	R/W	Value associated with a device output datum or weekly period: communication until all outputs to write and data available in the device have been transmitted.

### 4.3.3 Maintaining communications

The duration of the current communication can be modified by writing a new value to the item "MaxConnection" associated with the device:



The "MaxConnection" item can be written as many times as required, if initially set for this outgoing communication.

The OPC UA client can interrupt a communication:

- by writing a value smaller than the already elapsed communication time to the item "MaxConnection" associated with the device,
- by writing the value "0" to the item "AskedPrimary" or "AskedSecondary" associated with the device.

### 4.3.4 Issuing setpoints

Communication is immediately triggered whenever a new value is written to an item associated with a datum.

### 4.3.5 Access to operating parameters

The device operating parameters are managed according to the same principles as the setpoints.

Item name	Action
TimePeriod_xxxx	Access to weekly periods (or time periods)
UniversalPeriod_xxxx	Access to universal periods

### 4.3.6 Retransmission of time-stamped values

The retransmission of time-stamped data (time-stamped values) is initiated by the SOFREL OPC UA server when it possesses such data, as long as the client has subscribed to such items.



If no subscription has been defined for an item upon receipt of the time-stamped data, the latter are definitively lost.

When the data are received, they are retransmitted in "**unit mode**": several unit notifications, separated by a period of time defined according to the client's processing capabilities.



This time period is defined in the server configuration file, in the "HistoNotifDelay" parameter.

## 5 Operating diagnostics

### 5.1 Server monitoring

A software watchdog permanently monitors SOFREL OPC UA server operation.

### 5.2 Trace archiving

Traces are archived on the hard disc: the size of each trace file is fixed: **25,000 Kb**.

By default, the first backup file is named "xxx.log"; once this file's size limit is reached, a new file is automatically created to store the traces (up to **7 backup files** are created). The old backup file is then renamed by appending the date and time to the end of its name.

### 5.3 Advanced log file use

The traces produced by the SOFREL OPC UA server are divided into functionalities:

Functions	Description
Configuration	Configuration file management traces
Debug	General operating traces
Equipment	Device communication traces
Supervisor	SCADA (OPC UA) communication traces

Each functionality possesses its own eponymous log file.

The trace level can be configured via the general parameter **TraceLevel** in the configuration file. The following levels are available:

Trace level	Description
Error	Traces relating to downgraded operation
Warning	Traces relating to normal operating errors
Information	Operation monitoring traces
Verbose	Development traces

## 6 Glossary

• <b>Access point:</b>	Access points provide OPC clients with access to the functionalities offered by the SOFREL OPC UA server.
• <b>Communication medium:</b>	Hardware means of establishing a communication.
• <b>Continuous communication medium:</b>	Medium that does not require a physical connection to be established for each communication (Ethernet, GPRS, etc.).
• <b>Current data status:</b>	Instantaneous datum value (or current value). For example, the last value received from a given device for a given datum.
• <b>Data:</b>	Logical or digital datum possessing a current data status and possibly one or more time-stamped values.
• <b>Device:</b>	Addressable entity with which data are exchanged. Generic term representing Remote Terminal Units and Data Loggers.
• <b>DL:</b>	Abbreviation of Data Logger, an LS or LT type device.
• <b>Filter:</b>	Trace selection according to the interface, link, device, severity, etc.
• <b>Input:</b>	Datum derived from a terminal strip, protocol link or calculation. Non-modifiable by the SCADA.
• <b>Item:</b>	OPC object encapsulating access to telemetry data (value, time-stamp, quality, etc.).
• <b>LACBUS-RTU:</b>	Protocol used to communicate with Remote Terminal Units and Data Loggers.
• <b>LI:</b>	Logical input whose value can take on only one of two states: 0 or 1.
• <b>LO:</b>	Logical output whose value can take on only one of two states: 0 or 1.
• <b>NI:</b>	Digital input whose value is a floating point number.
• <b>NO:</b>	Digital output whose value is a floating point number.
• <b>Operating parameter:</b>	Structured datum derived from a device and which may be of the weekly period type or the universal period type. Modifiable by the SCADA.
• <b>Output:</b>	Datum sent to a terminal strip via a protocol link, or reserved for internal use. Modifiable by the SCADA.
• <b>PC:</b>	Data Centralization station (also referred to as SCADA).
• <b>Recipient:</b>	Person or Data Centralization Station capable of receiving operating data.
• <b>RTU:</b>	Abbreviation of Remote Terminal Unit, an S500, AS or S4 type 'pollable' device. S500 and AS are identical for the SOFREL OPC UA server.
• <b>S4:</b>	New Remote Terminal Unit.
• <b>SCADA:</b>	Data monitoring and acquisition system. A SCADA connects to the SOFREL OPC UA server via one or more OPC UA clients.
• <b>Setpoint:</b>	Logical or digital output datum. Modifiable by the SCADA.
• <b>Time-stamp:</b>	Date with time precise to within one second (regional and language format used).
• <b>Time-stamped values:</b>	Series of time-stamped current data statuses archived to monitor datum changes over time.
• <b>TLS:</b>	Secure IP exchange protocol (Transport Layer Security).
• <b>Universal period:</b>	A universal period is defined by a start date and an end date. The dates are defined by the day of the month, the month, the hour and the minute. The status of the universal period is represented by a logical input datum.
• <b>Weekly period:</b>	A weekly period is defined by 4 daily time periods for each day of the week. The status of the weekly period is represented by a logical input datum.