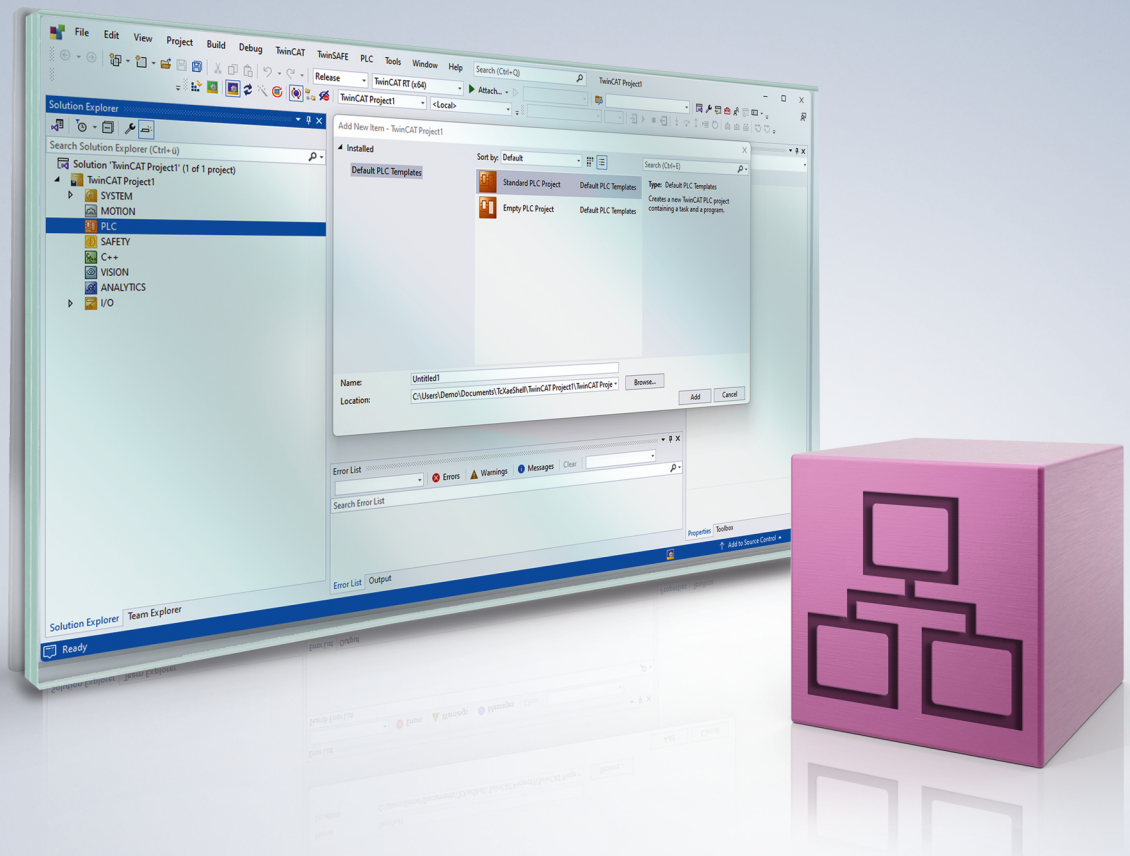
BECKHOFF New Automation Technology

Manual | EN

TF6340

TwinCAT 3 | Serial Communication



2026-03-25 | Version: 1.8.1

Table of contents

1 Foreword 5
1.1 Notes on the documentation 5
1.2 For your safety 6
1.3 Notes on information security 7
2 Overview 8
3 Installation 10
3.1 System Requirements 10
3.2 Installation 10
3.3 Installation TwinCAT 3.1 Build 4026 13
3.4 Installation Windows CE 13
3.5 Installation TwinCAT/BSD 15
3.6 Licensing 15
4 Configuration 18
4.1 Tutorial 18
4.1.1 Add library to PLC project 18
4.1.2 Sending and Receiving 19
4.1.3 Background Communication 20
4.1.4 Task Configuration 22
4.1.5 Serial PC Interface 22
4.1.6 Serial EtherCAT Terminal 25
4.1.7 Serial Bus Terminal 27
4.2 Supported Hardware 29
4.3 Communication Principle 31
5 PLC API 33
5.1 Function blocks 33
5.1.1 Send + Receive 33
5.1.2 Configuration 44
5.1.3 Background Communication 51
5.1.4 3964R + RK512 protocols 54
5.2 Functions 61
5.2.1 Help Functions 61
5.2.2 Conversion functions 62
5.3 Data Types 64
5.3.1 Structures 64
5.3.2 Enumerations 70
5.4 Global constants 72
5.4.1 Library version 72
6 Examples 74
7 Appendix 75
7.1 Error codes overview 75
7.2 Error Codes ComError_t 75
7.3 Error Codes SerialLineControlADS 76
7.4 Error Codes 3964R 81

7.5 Error Codes RK512 82
7.6 ADS Return Codes 84
7.7 Win32 Error Codes 88

8 Support and Service 144

1 Foreword

1.1 Notes on the documentation

This description is intended exclusively for trained specialists in control and automation technology who are familiar with the applicable national standards.
The documentation and the following notes and explanations must be complied with when installing and commissioning the components.
The trained specialists must always use the current valid documentation.

The trained specialists must ensure that the application and use of the products described is in line with all safety requirements, including all relevant laws, regulations, guidelines, and standards.

Disclaimer

The documentation has been compiled with care. The products described are, however, constantly under development.
We reserve the right to revise and change the documentation at any time and without notice.
Claims to modify products that have already been supplied may not be made on the basis of the data, diagrams, and descriptions in this documentation.

Trademarks

Beckhoff®, ATRO®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, MX-System®, Safety over EtherCAT®, TC/BSD®, TwinCAT®, TwinCAT/BSD®, TwinSAFE®, XFC®, XPlanar®, and XTS® are registered and licensed trademarks of Beckhoff Automation GmbH.
If third parties make use of the designations or trademarks contained in this publication for their own purposes, this could infringe upon the rights of the owners of the said designations.



EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Copyright

© Beckhoff Automation GmbH & Co. KG, Germany.
The distribution and reproduction of this document, as well as the use and communication of its contents without express authorization, are prohibited.
Offenders will be held liable for the payment of damages. All rights reserved in the event that a patent, utility model, or design are registered.

Third-party trademarks

Trademarks of third parties may be used in this documentation. You can find the trademark notices here: https://www.beckhoff.com/trademarks.

1.2 For your safety

Safety regulations

Read the following explanations for your safety.
Always observe and follow product-specific safety instructions, which you may find at the appropriate places in this document.

Exclusion of liability

All the components are supplied in particular hardware and software configurations which are appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation, and drive technology who are familiar with the applicable national standards.

Signal words

The signal words used in the documentation are classified below. In order to prevent injury and damage to persons and property, read and follow the safety and warning notices.

Personal injury warnings

⚠ DANGER
Hazard with high risk of death or serious injury.

⚠ WARNING
Hazard with medium risk of death or serious injury.

⚠ CAUTION
There is a low-risk hazard that could result in medium or minor injury.

Warning of damage to property or environment

NOTICE
The environment, equipment, or data may be damaged.

Information on handling the product



This information includes, for example:
recommendations for action, assistance or further information on the product.

1.3 Notes on information security

The products of Beckhoff Automation GmbH & Co. KG (Beckhoff), insofar as they can be accessed online, are equipped with security functions that support the secure operation of plants, systems, machines and networks. Despite the security functions, the creation, implementation and constant updating of a holistic security concept for the operation are necessary to protect the respective plant, system, machine and networks against cyber threats. The products sold by Beckhoff are only part of the overall security concept. The customer is responsible for preventing unauthorized access by third parties to its equipment, systems, machines and networks. The latter should be connected to the corporate network or the Internet only if appropriate protective measures have been set up.

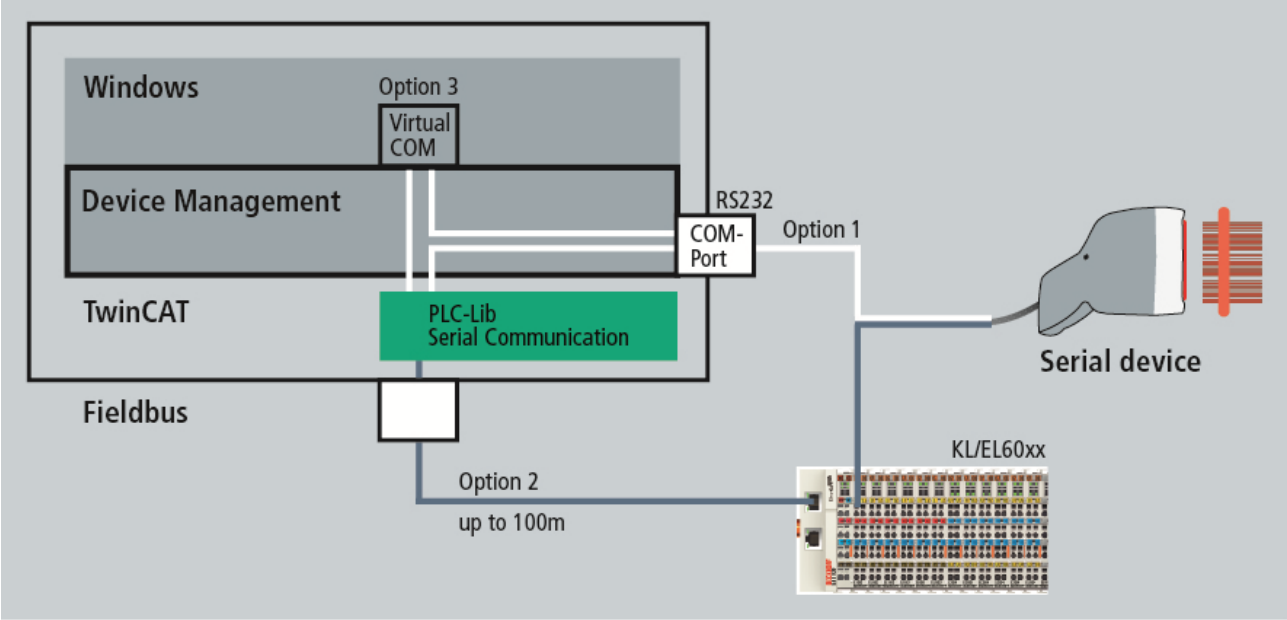
In addition, the recommendations from Beckhoff regarding appropriate protective measures should be observed. Further information regarding information security and industrial security can be found in our https://www.beckhoff.com/secguide.

Beckhoff products and solutions undergo continuous further development. This also applies to security functions. In light of this continuous further development, Beckhoff expressly recommends that the products are kept up to date at all times and that updates are installed for the products once they have been made available. Using outdated or unsupported product versions can increase the risk of cyber threats.

To stay informed about information security for Beckhoff products, subscribe to the RSS feed at https://www.beckhoff.com/secinfo.

2 Overview

The TwinCAT 3 function enables serial data communication for the TwinCAT 3 PLC.



The following three options are available for the communication:

Option 1: PC COM ports

You can address your physical COM port directly from the PLC.

Option 2: Beckhoff Terminals

The network-based fieldbus system from Beckhoff can be used to access serial terminals at a distance of up to 100 m.

The following Beckhoff terminals are supported:

- KL6xxx Bus Terminals
- EL60xx EtherCAT Terminals

Option 3: Virtual COM ports

The function provides an ADS server for accessing virtual COM ports of the operating system from the PLC. This enables the use of USB devices that come with a proprietary USB-To-VirtualCom driver.

The COM port must register in Windows as 'COM1' ... 'COM255'.
In the TwinCAT/BSD operating system, the COM port must be registered as `ttyu0`...`ttyu255`.
In the Beckhoff RT Linux® operating system, the COM port must register as `ttyUSB0`...`ttyUSB255` or `ttyACM0`...`ttyACM255`.

Installation required

To use virtual COM ports, it is necessary to install the TwinCAT 3 Function Setup or the corresponding XAR package on the system where the virtual COM port exists.

Components of the TwinCAT 3 Function:

- **PLC library Tc2_SerialCom**: The PLC library provides function blocks and data structures for communicating with serial devices. Various function blocks for sending, receiving and configuration are available.
  All function blocks can be instantiated multiple times, so that any number of serial interfaces can be operated in parallel, depending on the performance of the PC.
  In addition to the basic functions of sending and receiving transparent data, the **3964R protocol** is supported. A fail-safe protocol for transmitting any data is implemented. A checksum in combination with repetition of data telegrams in the event of an error are used for error protection.

The **RK512 protocol** is used for transmitting data blocks, like those used in Siemens controllers. The user only has to parameterize the RK512 function block. It uses the 3964R protocol and handles the necessary telegram traffic. It supports the transmission of data blocks with a length of up to 128 data words.

- **TwinCAT TcAdsSerialCommServer**: Is a service that is started and stopped together with TwinCAT. It is used to communicate with virtual COM ports of the operating system. Otherwise, this component can be omitted during installation.

3 Installation

3.1 System Requirements

Technical data		TF6340 | TwinCAT 3 Serial Communication
Target system	Windows	WEC7, Win10, Win11 IPC or CX (x86, x64, Arm®)
	TwinCAT/BSD	TwinCAT/BSD >= 13.0 IPC or CX (x64)
	Beckhoff RT Linux®	Beckhoff RT Linux® >= 13.3 IPC or CX (x64, Arm®)
TwinCAT	Min. TwinCAT version	3.1.4012
	Min. TwinCAT level	TC1200 TwinCAT 3 PLC
	Required TwinCAT license	TF6340 TC3 Serial Communication
Required package Engineering (XAE)	Windows (TcPkg)	TF6340-TwinCAT-Serial-Communication-XAE

Special system requirements

Installing the TF6340 TwinCAT 3 Serial Communication function provides the option of installing an ADS server. This is necessary if virtual COM ports are to be accessed. The XAR package of the installation includes this ADS server called TcAdsSerialCommServer.

When using the TcAdsSerialCommServer, the following system requirements apply for the system on which the ADS server is to be installed:

Technical data		TF6340 | TwinCAT 3 Serial Communication
Target system	Windows	WEC7, Win10, Win11 IPC or CX (x86, x64, Arm®)
	TwinCAT/BSD	TwinCAT/BSD >= 13.2.0.10 IPC or CX (x64)
	Beckhoff RT Linux®	Beckhoff RT Linux® >= 13.3 IPC or CX (x64, Arm®)
TwinCAT	Min. Target Platform Level	P 30 or higher
	Min. TwinCAT version	3.1.4016
	Min. TwinCAT level	TC1000 TC3 ADS
Required package Runtime (XAR)	Windows (TcPkg)	TF6340-TwinCAT-Serial-Communication-XAR
	TwinCAT/BSD (pkg)	TF6340-Serial-Communication.pkg >= 2.4.5
	Beckhoff RT Linux® (apt)	tf6340-serial-communication >= 2.5.6

3.2 Installation

Setup installation (TwinCAT 3.1 Build 4024)

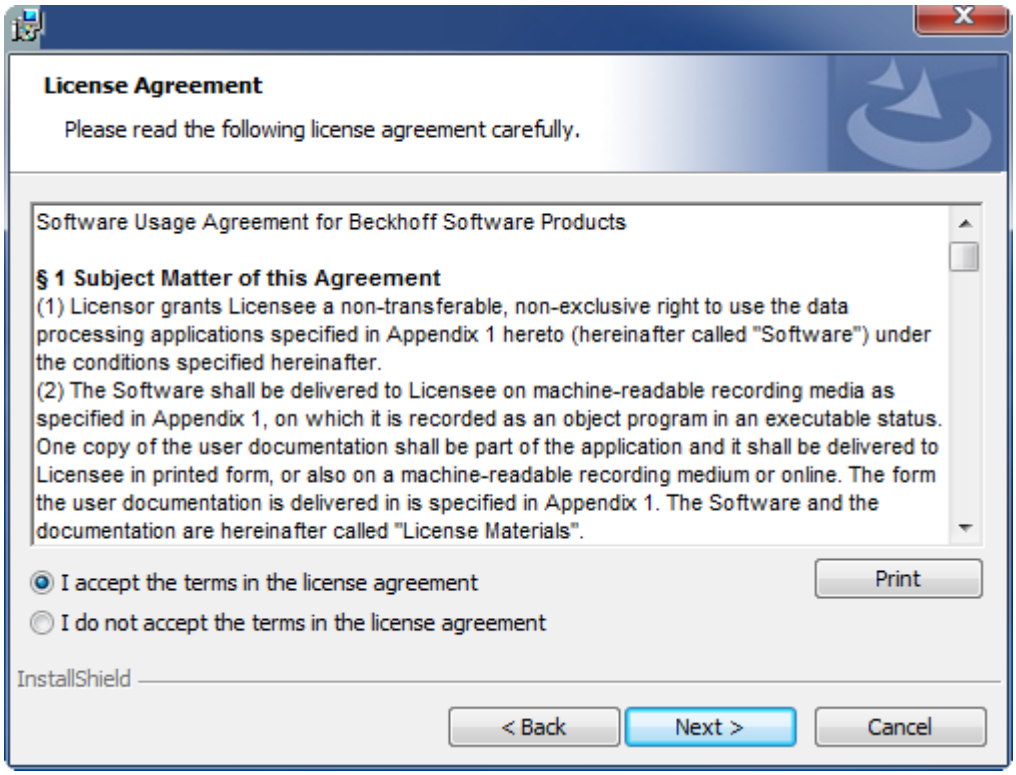
The following section describes how to install the TwinCAT 3 function for Windows-based operating systems.

✓ The TwinCAT 3 function setup file was downloaded from the Beckhoff website.

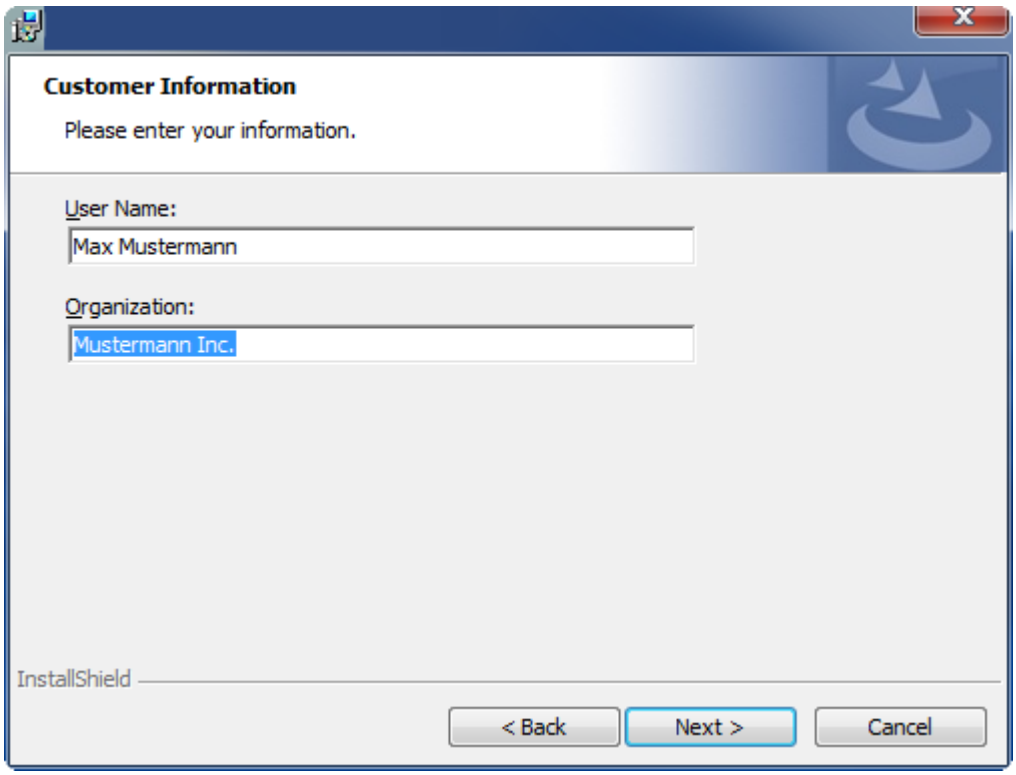
1. Run the setup file as administrator. To do this, select the **Run As Admin** command in the context menu of the file.

   ⇨ The installation dialog opens.

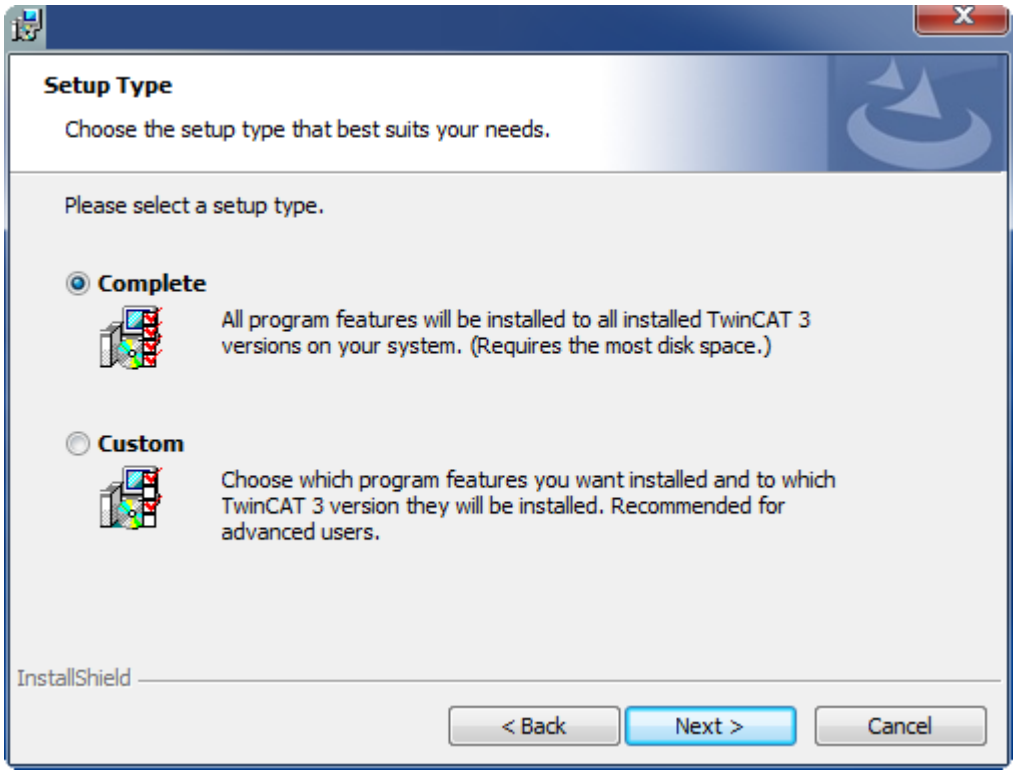
2. Accept the end user licensing agreement and click **Next**.



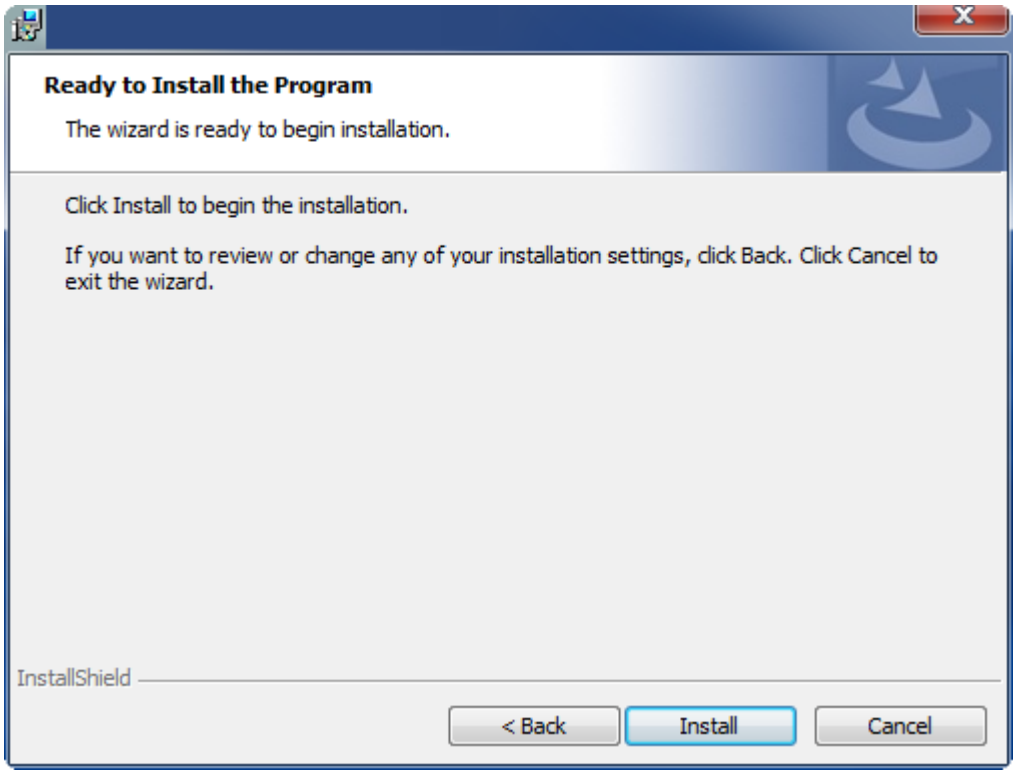
3. Enter your user data.



4. If you want to install the full version of the TwinCAT 3 function, select **Complete** as the installation type. If you want to install the TwinCAT 3 function components separately, select **Custom**.

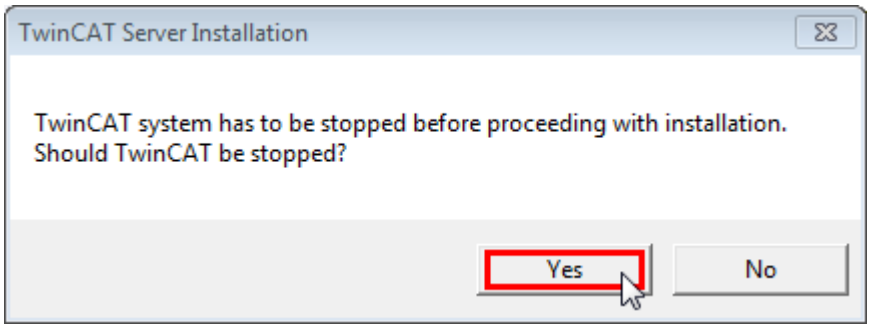


5. Click **Next**, then **Install** to start the installation.

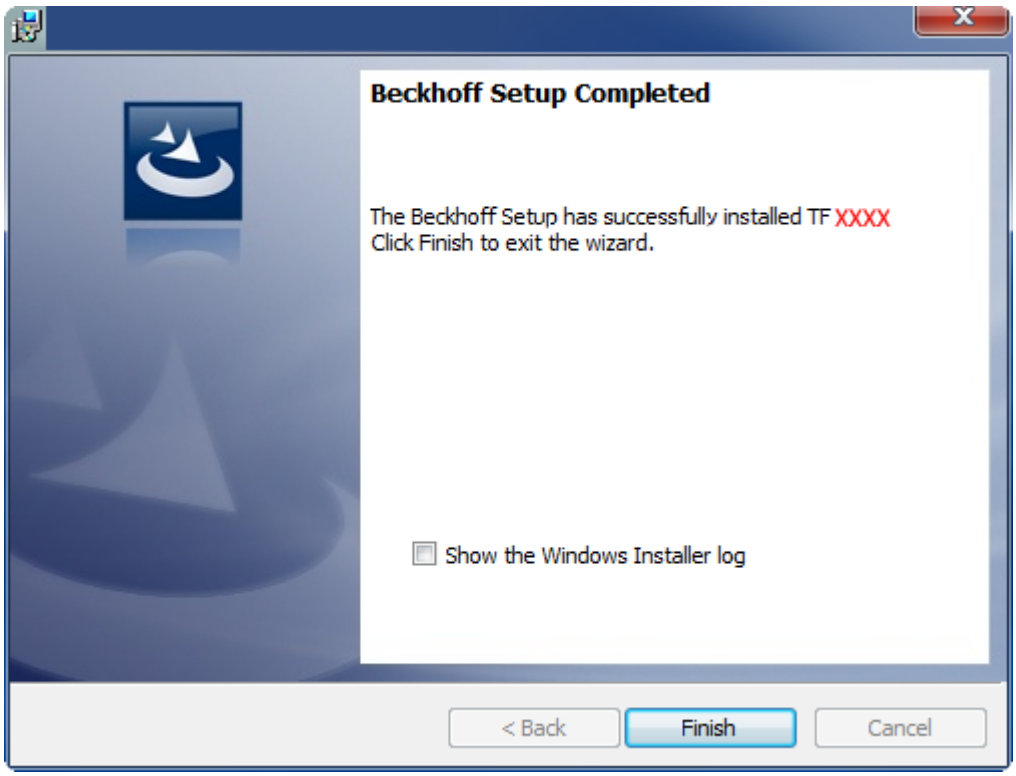


⇨ A dialog box informs you that the TwinCAT system must be stopped to proceed with the installation.

6. Confirm the dialog with **Yes.**



7. Click **Finish** to exit the setup.



⇨ The TwinCAT 3 function has been installed successfully.

3.3 Installation TwinCAT 3.1 Build 4026

TwinCAT Package Manager: Installation (TwinCAT 3.1 Build 4026)

Detailed instructions on installing products can be found in the chapter Managing TwinCAT software in the TwinCAT 3.1 Build 4026 installation instructions.

Install the following workload to be able to use the product:

- **TF6340 | TwinCAT 3 Serial Communication**

3.4 Installation Windows CE

The following section describes how to install a TwinCAT 3 function (TFxxx) on a Beckhoff Embedded PC with Windows CE.

1. Download and install the setup file [▶ 14]
2. Transfer the CAB file to the Windows CE device [▶ 14]
3. Run the CAB file on the Windows CE device [▶ 14]

If an older TFxxx version is already installed on the Windows CE device, it can be updated:

- Software upgrade [▶ 15]

Download and install the setup file

The CAB installation file for Windows CE is part of the TFxxx setup. This is made available on the Beckhoff website www.beckhoff.com and automatically contains all versions for Windows XP, Windows 7 and Windows CE (x86 and ARM).

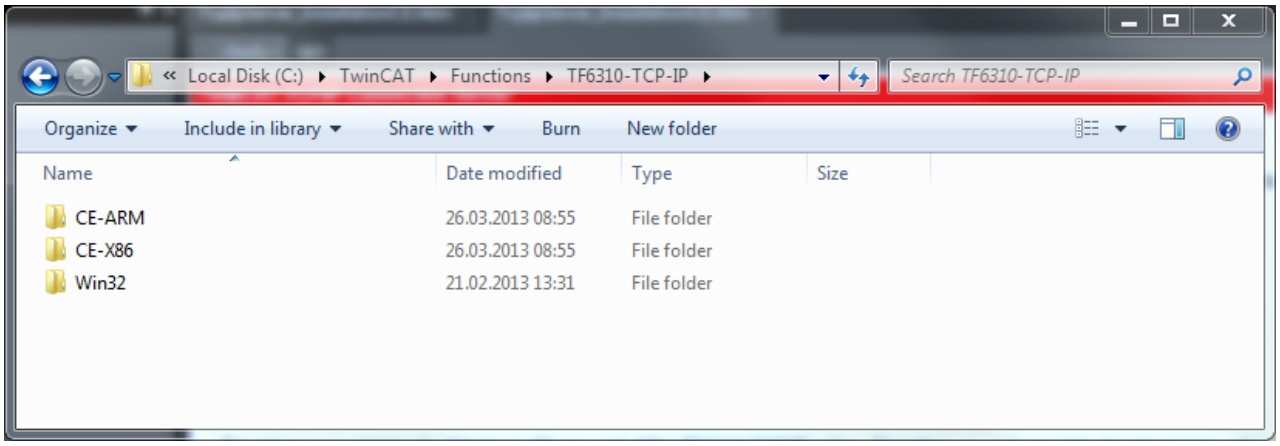
Download the TFxxx setup file and install the TwinCAT 3 function as described in the Installation [▶ 10] section.

After the installation, the installation folder contains three directories (one directory per hardware platform):

- **CE-ARM:** ARM-based embedded PCs running Windows CE, e.g. CX8090, CX9020
- **CE-X86:** X86-based embedded PCs running Windows CE, e.g. CX50xx, CX20x0
- **Win32:** embedded PCs running Windows XP, Windows 7 or Windows Embedded Standard

The CE-ARM and CE-X86 directories contain the CAB files of the TwinCAT 3 function for Windows CE in relation to the respective hardware platform of the Windows CE device.

Example: installation folder "TF6310"



Transfer the CAB file to the Windows CE device

Transfer the corresponding CAB file to the Windows CE device.

There are various options for transferring the executable file:

- via network shares
- via the integrated FTP server
- via ActiveSync
- via CF/SD cards

Further information can be found in the Beckhoff Information System in the "Operating Systems" documentation (Embedded PC > Operating Systems > CE).

Run the CAB file on the Windows CE device

After transferring the CAB file to the Windows CE device, double-click the file there. Confirm the installation dialog with **OK**. Then restart the Windows CE device.

After restarting the device, the files of the TwinCAT 3 function (TFxxxx) are automatically loaded in the background and are then available.

The software is installed in the following directory on the Windows CE device:
\Hard Disk\TwinCAT\Functions\TFxxxx

Software upgrade

If an older version of the TwinCAT 3 function is already installed on the Windows CE device, carry out the following steps on the Windows CE device to upgrade to a new version:

1. Open the CE Explorer by clicking **Start > Run** and entering "Explorer".
2. Navigate to *\Hard Disk\TwinCAT\Functions\TFxxx\xxxx*.
3. Rename the file *Tc*.exe* to *Tc*.old*.
4. Restart the Windows CE device.
5. Transfer the new CAB file to the Windows CE device.
6. Run the CAB file on the Windows CE device and install the new version.
7. Delete the file *Tc*.old*.
8. Restart the Windows CE device.

⇨ The new version is active after the restart.

3.5 Installation TwinCAT/BSD

Detailed instructions on how to install the product under TwinCAT/BSD can be found in the TwinCAT/BSD documentation.

3.6 Licensing

The TwinCAT 3 function can be activated as a full version or as a 7-day test version. Both license types can be activated via the TwinCAT 3 development environment (XAE).

Licensing the full version of a TwinCAT 3 Function

A description of the procedure to license a full version can be found in the Beckhoff Information System in the documentation "TwinCAT 3 Licensing".

Licensing the 7-day test version of a TwinCAT 3 Function

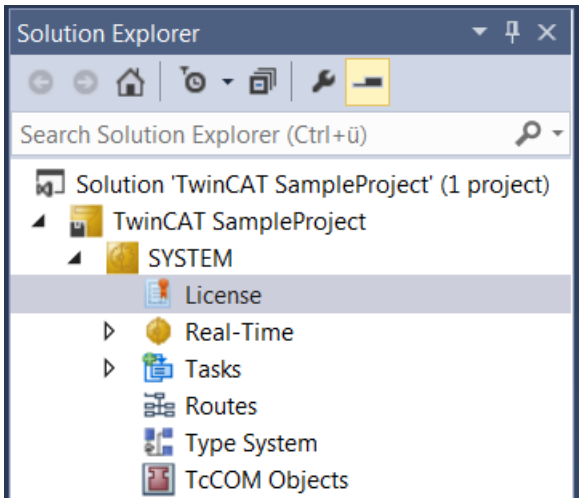


A 7-day test version cannot be enabled for a TwinCAT 3 license dongle.

1. Start the TwinCAT 3 development environment (XAE).
2. Open an existing TwinCAT 3 project or create a new project.
3. If you want to activate the license for a remote device, set the desired target system. To do this, select the target system from the **Choose Target System** drop-down list in the toolbar.

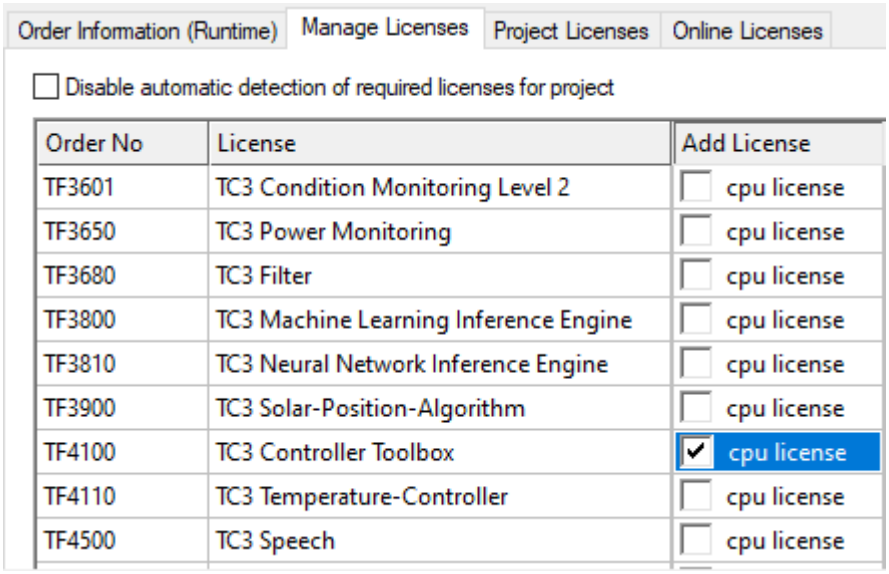
   ⇨ The licensing settings always refer to the selected target system. When the project is activated on the target system, the corresponding TwinCAT 3 licenses are automatically copied to this system.

4. In the **Solution Explorer**, double-click **License** in the **SYSTEM** subtree.



⇨ The TwinCAT 3 license manager opens.

5. Open the **Manage Licenses** tab. In the **Add License** column, check the check box for the license you want to add to your project (e.g. "TF4100 TC3 Controller Toolbox").

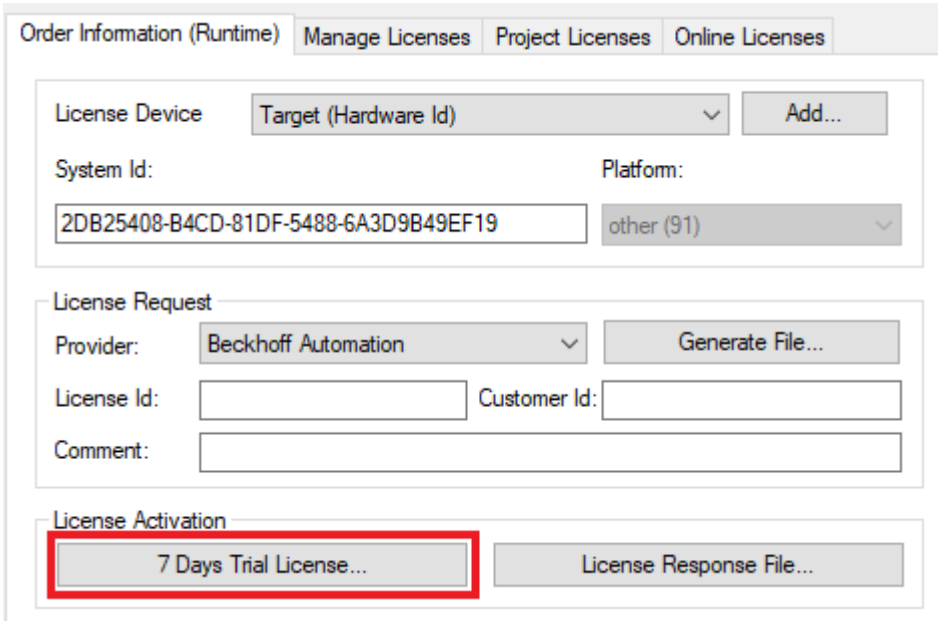


Order No	License	Add License
TF3601	TC3 Condition Monitoring Level 2	cpu license
TF3650	TC3 Power Monitoring	cpu license
TF3680	TC3 Filter	cpu license
TF3800	TC3 Machine Learning Inference Engine	cpu license
TF3810	TC3 Neural Network Inference Engine	cpu license
TF3900	TC3 Solar-Position-Algorithm	cpu license
TF4100	TC3 Controller Toolbox	cpu license
TF4110	TC3 Temperature-Controller	cpu license
TF4500	TC3 Speech	cpu license

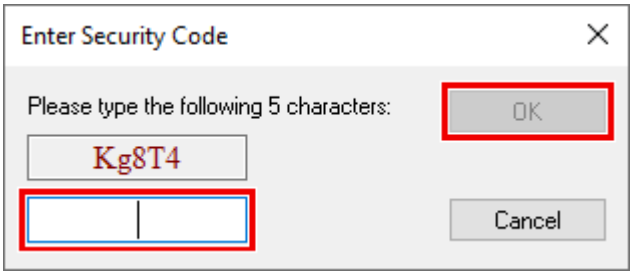
6. Open the **Order Information (Runtime)** tab.

⇨ In the tabular overview of licenses, the previously selected license is displayed with the status “missing”.

7. Click **7-Day Trial License...** to activate the 7-day trial license.



⇨ A dialog box opens, prompting you to enter the security code displayed in the dialog.



8. Enter the code exactly as it is displayed and confirm the entry.
9. Confirm the subsequent dialog, which indicates the successful activation.
   ⇨ In the tabular overview of licenses, the license status now indicates the expiry date of the license.
10. Restart the TwinCAT system.

⇨ The 7-day trial version is enabled.

4 Configuration

4.1 Tutorial

This tutorial guides the user through the complete implementation of a serial communication. The following tasks are explained step by step:

- Adding the required PLC library
- Implementation of a small PLC application that sends and receives data
- Configuring the PLC background communication to ensure the data exchange with the process image
- Task configuration
- Adding the hardware component and linking with the PLC process image

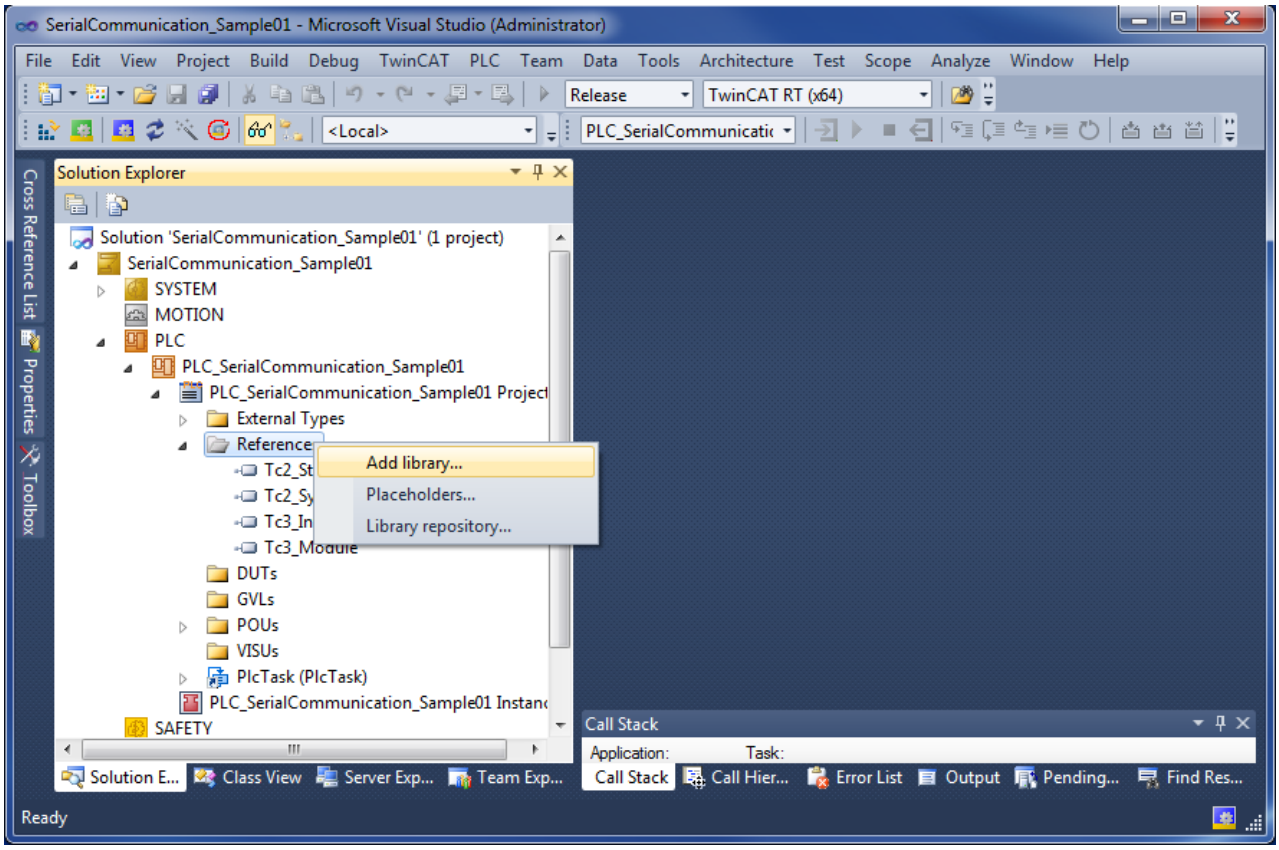
The tutorial is suitable for all hardware interfaces: PC COM port, EL6xxx or KL6xxx Terminal.

Further examples and a download of the TwinCAT project described here can be found in the chapter Examples [▶ 74].

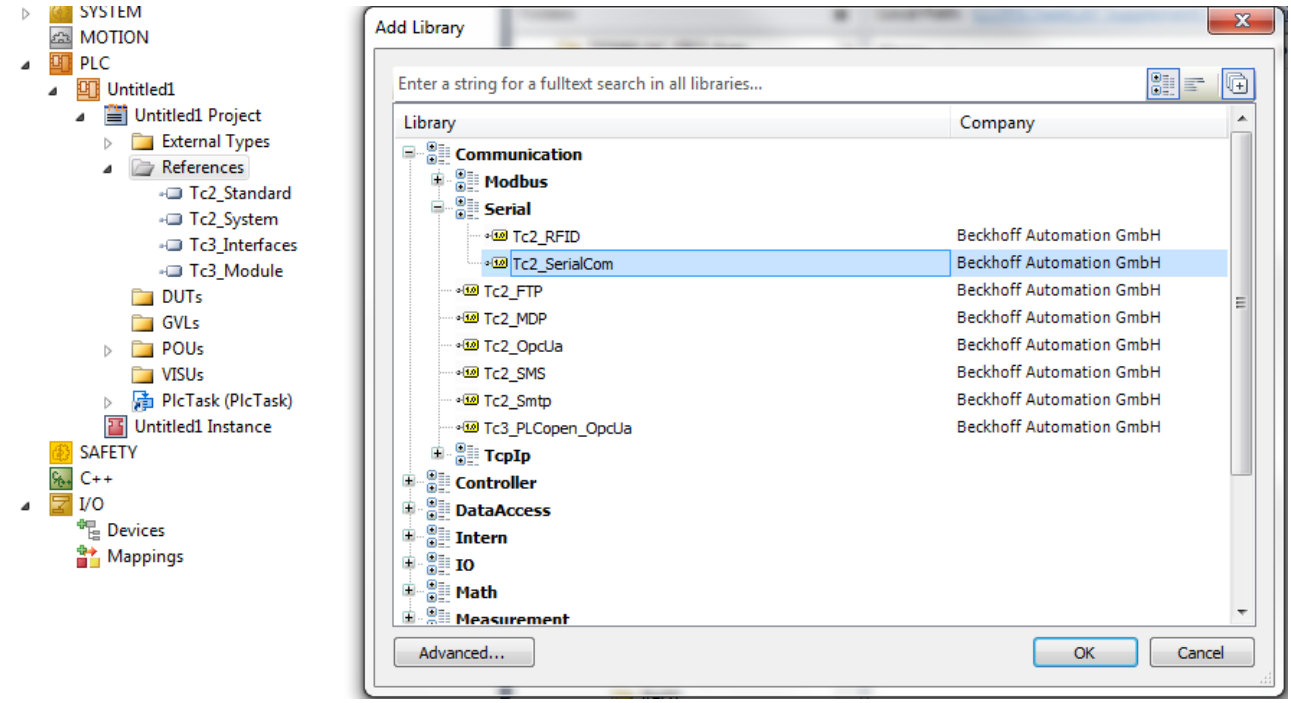
4.1.1 Add library to PLC project

Create a new PLC project to start integration of the library for the demo implementation.

In your PLC project select "**Add Library**" from the References node.



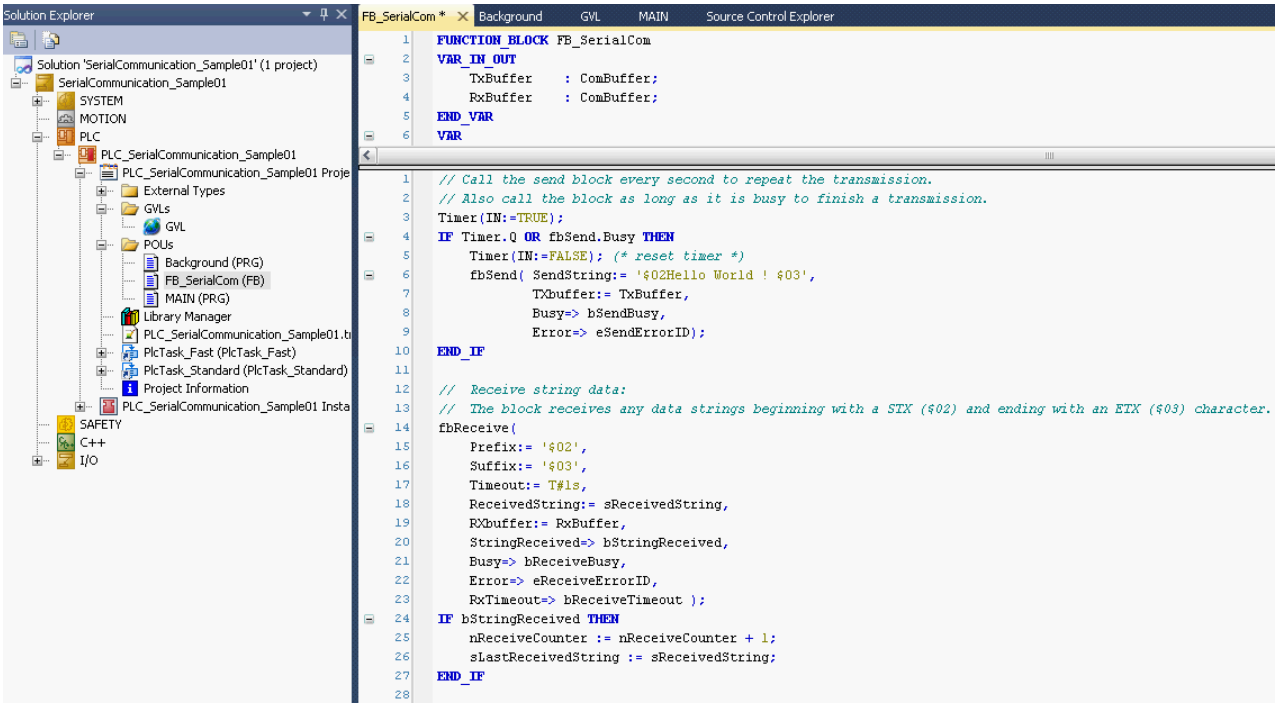
Navigate to the category Communication/Serial and select the library Tc2_SerialCom:



4.1.2 Sending and Receiving

Data is sent and received from the standard task.

The example program included sends data by way of different serial hardware interfaces.
At the same time data with correct prefix and suffix is received.
If a loop back adapter is connected to the serial hardware interfaces, the sent characters are received again and again.



Many other use cases exist. For example data can be sent by way of the serial PC interface to a printer. Or a bar code from a scanner that is connected to a serial bus terminal can be received.

Possible errors

More than one character may be transmitted during one PLC cycle, provided they can be accepted by the send buffer. If the send buffer overflows, the busy output of the send block will remain TRUE after it has been called. In that case the last character is not sent, and the block must be called again with the same input data in the next PLC cycle. How full a buffer is can be determined at any time (e.g. TxBuffer.Count or TxBuffer.FreeByte).

4.1.3 Background Communication

Depending on the requirements, communication between the serial hardware and the ComBuffer [▶ 64] data buffers is handled in either the standard task or a separate fast task.

A separate fast task is necessary when using high baud rates or KL6001 Terminals, which have a small process image (only 3 or 5 bytes). See also the Communication Principle [▶ 31].

The tutorial uses the following three hardware interfaces:

Hardware interface	Background communication
PC COM port	In the standard task
EL6001	In the separate fast task
KL6001 (3 bytes)	In the separate fast task

Data structures

Four data structures are required to address a serial interface.

There are two different types of data structures:
- Hardware-dependent structures establish the connection to the hardware in the send and receive directions.
- In addition, two data buffers are required as intermediate storage.

PC COM port:

```
PROGRAM MAIN
VAR
    (* I/O variables for a PC-COM port *)
    stIn_PcCom AT %I*  : PcComInData; (* linked to the port in the TwinCAT System Manager *)
    stOut_PcCom AT %Q*  : PcComOutData; (* linked to the port in the TwinCAT System Manager *)
    RxBufferPcCom       : ComBuffer; (* Receive data buffer; used with all receive function blocks
*)
    TxBufferPcCom       : ComBuffer; (* Transmit data buffer; used with all receive function blocks
*)
END_VAR
```

EL6xxx and KL6xxx:

```
VAR_GLOBAL
    RxBufferEL : ComBuffer; (* Receive data buffer; used with all receive function blocks *)
    TxBufferEL : ComBuffer; (* Transmit data buffer; used with all receive function blocks *)

    RxBufferKL : ComBuffer; (* Receive data buffer; used with all receive function blocks *)
    TxBufferKL : ComBuffer; (* Transmit data buffer; used with all receive function blocks *)
END_VAR
```

```
PROGRAM Background
VAR
    (* I/O variables for a EL6001 terminal*)
    stIn_EL6001 AT %I*    : EL6inData22B; (* linked to the EL6001 in the TwinCAT System Manager *)
    stOut_EL6001 AT %Q*    : EL6outData22B;(* linked to the EL6001 in the TwinCAT System Manager *)
     (* I/O variables for a KL6001 terminal*)
    stIn_KL6001 AT %I*    : KL6inData; (* linked to the KL6001 in the TwinCAT System Manager *)
    stOut_KL6001 AT %Q*   : KL6outData; (* linked to the KL6001 in the TwinCAT System Manager *)
END_VAR
```

SerialLineControl

The SerialLineControl function block must be called in every PLC cycle.
It communicates with the serial hardware device and transmits and receives data.
The function block can be called both from the standard task and from the separate fast task.

Called from the standard task, PC COM port:

```
PROGRAM MAIN
VAR
    (* background communication with the PC COM port device *)
    fbPcComCtrl       : SerialLineControl;
    bPcComCtrlError   : BOOL;
    ePcComCtrlErrorID : ComError_t;
END_VAR
```

```
(* background communication with the PC COM port device *)
fbPcComCtrl(
    Mode      := SERIALLINEMODE_PC_COM_PORT,
    pComIn    := ADR(stIn_PcCom),
    pComOut   := ADR(stOut_PcCom),
    SizeComIn := SIZEOF(stIn_PcCom),
    Error      => bPcComCtrlError,
    ErrorID    => ePcComCtrlErrorID,
    TxBuffer  := TxBufferPcCom,
    RxBuffer  := RxBufferPcCom );
```

Called from the separate fast task, EL6xxx and KL6xxx:

```
PROGRAM Background
VAR
    (* background communication with the EL6001 terminal *)
    fbEL6001Ctrl       : SerialLineControl;
    bEL6001CtrlError   : BOOL;
    eEL6001CtrlErrorID : ComError_t;

    (* background communication with the KL6001 terminal (3byte) *)
    fbKL6001Ctrl         : SerialLineControl;
    bKL6001CtrlError     : BOOL;
    eKL6001CtrlErrorID   : ComError_t;
    fbKL6001Config       : KL6configuration;
    bKL6001ConfigError   : BOOL;
    eKL6001ConfigErrorID : ComError_t;
    bKL6001ConfigExe     : BOOL := TRUE;
END_VAR
```

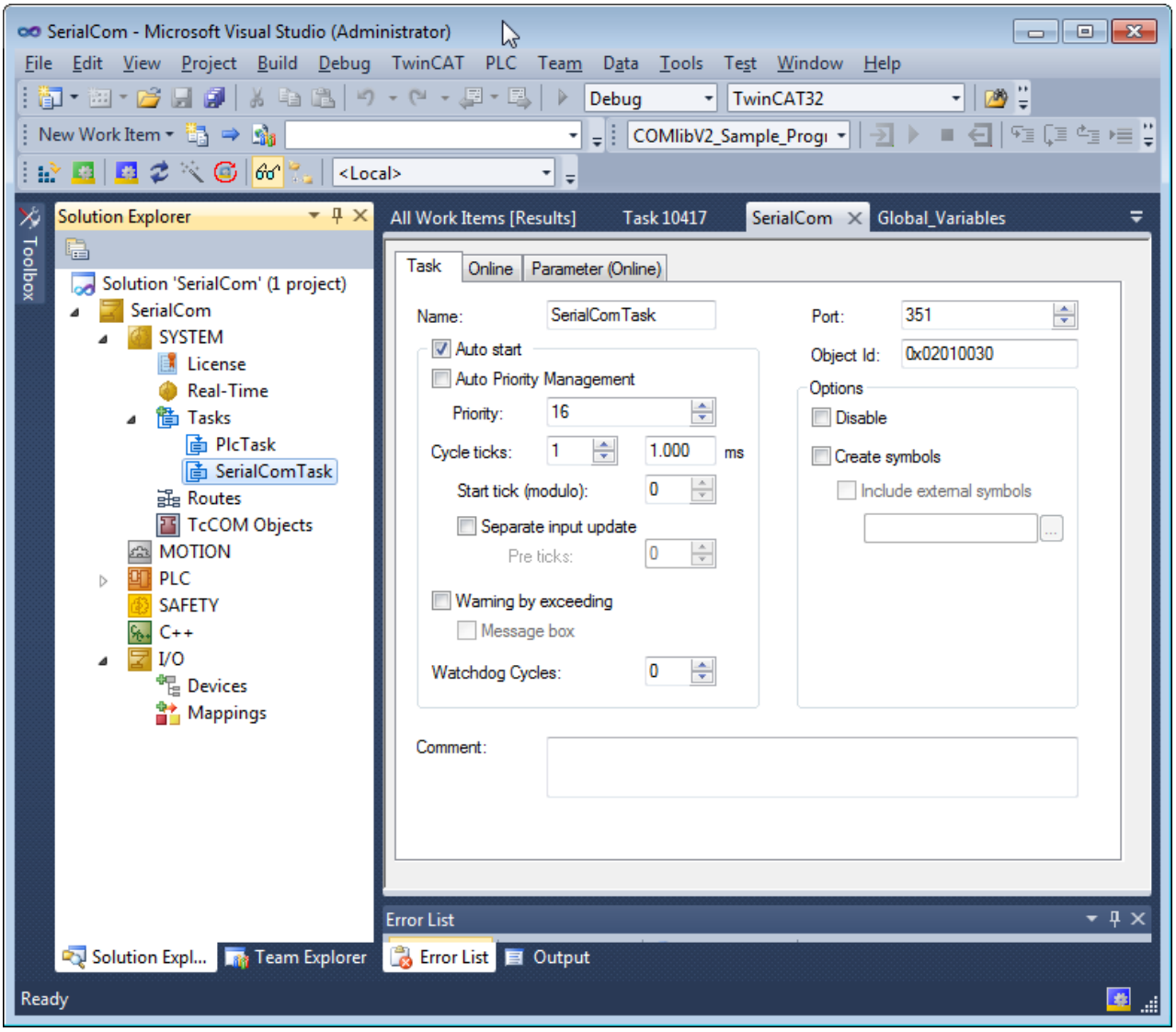
```
(* background communication with the EL6001 terminal *)
fbEL6001Ctrl(
    Mode:= SERIALLINEMODE_EL6_22B,
    pComIn:= ADR(stIn_EL6001),
    pComOut:= ADR(stOut_EL6001),
    SizeComIn:= SIZEOF(stIn_EL6001),
    Error=> bEL6001CtrlError,
    ErrorID=> eEL6001CtrlErrorID,
    TxBuffer:= TxBufferEL,
    RxBuffer:= RxBufferEL );

(* background communication with the KL6001 terminal (3byte) *)
fbKL6001Config(
    Execute:= bKL6001ConfigExe,
    Mode:= SERIALLINEMODE_KL6_3B_ALTERNATIVE,
    Baudrate:= 9600,
    NoDatabits:= 8,
    Parity:= 0,
    Stopbits:= 1,
    Handshake:= HANDSHAKE_NONE,
    ContinousMode:= FALSE,
    pComIn:= ADR(stIn_KL6001),
    pComOut:= ADR(stOut_KL6001),
    SizeComIn:= SIZEOF(stIn_KL6001),
    Done=> ,
    Busy=> ,
    Error=> bKL6001ConfigError,
    ErrorId=> eKL6001ConfigErrorID );
IF NOT fbKL6001Config.Busy AND NOT bKL6001ConfigError THEN
    bKL6001ConfigExe := FALSE;
    fbKL6001Ctrl(
        Mode:= SERIALLINEMODE_KL6_3B_ALTERNATIVE,
        pComIn:= ADR(stIn_KL6001),
        pComOut:= ADR(stOut_KL6001),
        SizeComIn:= SIZEOF(stIn_KL6001),
        Error=> bKL6001CtrlError,
        ErrorID=> eKL6001CtrlErrorID,
        TxBuffer:= TxBufferKL,
        RxBuffer:= RxBufferKL );
END_IF
```

4.1.4 Task Configuration

The speed of the serial interfaces must be considered for the task configuration (see the section on Supported Hardware [▶ 29] and the Communication Principle [▶ 31]).

For example, in order that, with 9600 bps at the serial bus terminal, the data can all actually be processed at this speed, the associated communication block must be active at least once per millisecond. The task that operates the function block must have a correspondingly fast setting. The simplest case is when the entire PLC program runs in this fast task. If the task is set slower, then as long as the interface operates with a hardware handshake, the communication will function at reduced speed. Without handshake, data to be received can be lost.



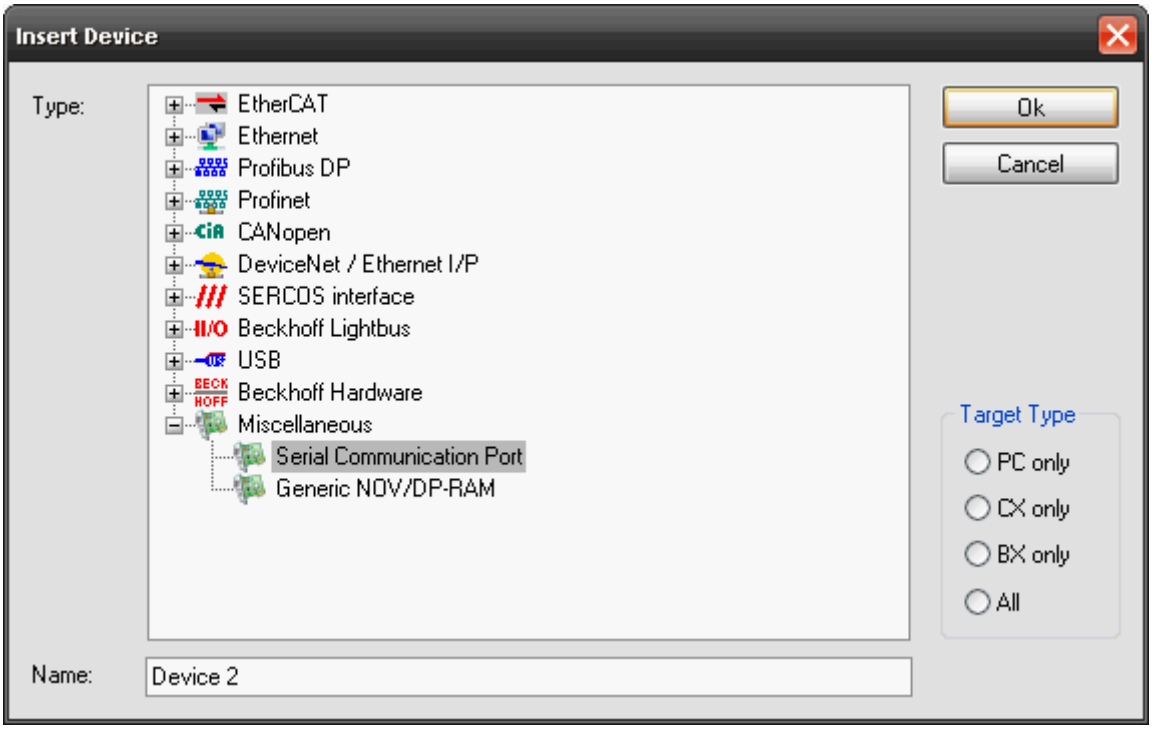
NOTICE

Data loss possible

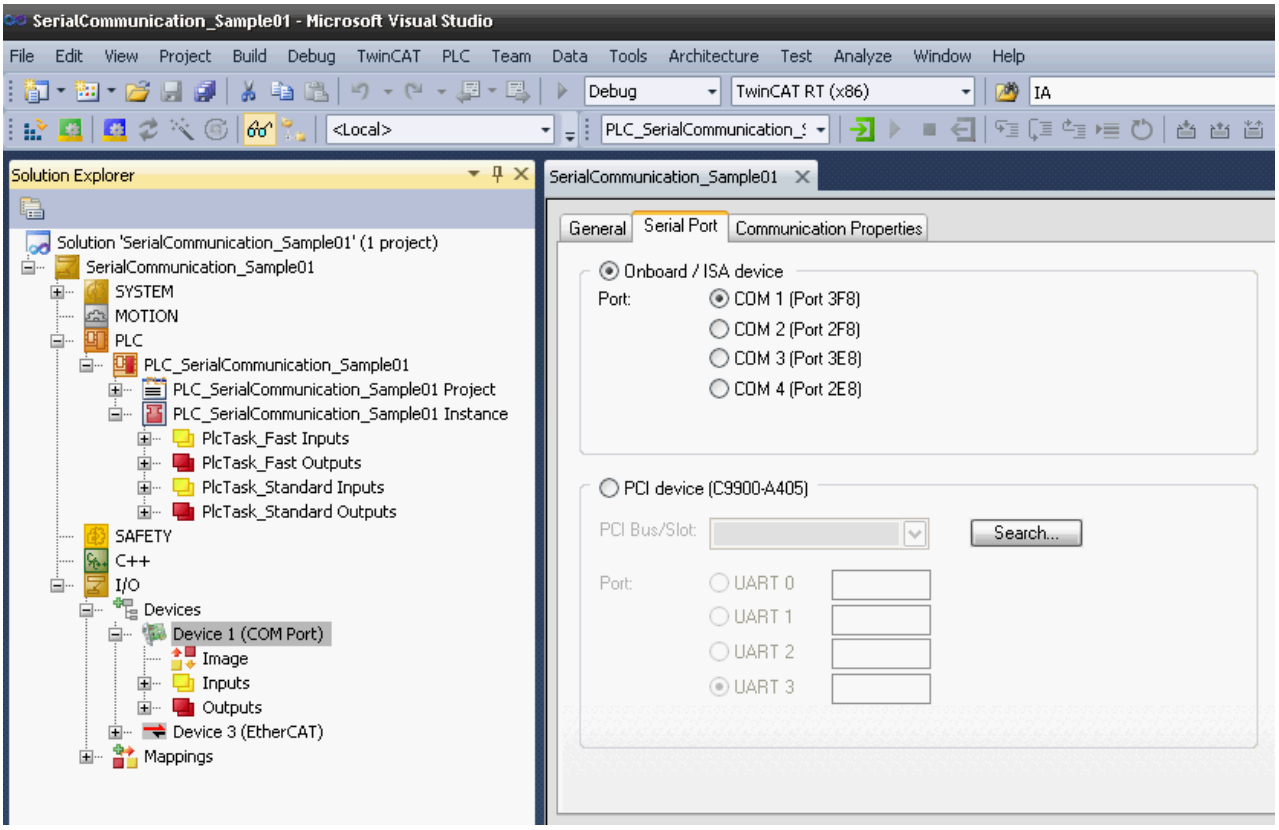
When using KL6xxx Bus Terminals on BKxxxx Bus Couplers, please note that the K-bus update time must be below the cycle time of the task. The K-bus update time can be read in the TwinCAT System Manager after clicking on the bus coupler below the I/O configuration. A reserve of 10 % to 20 % should be taken into account. If there are many bus terminals on one bus coupler, the **cycle time of the task** may have to be set to **at least 2 ms**.

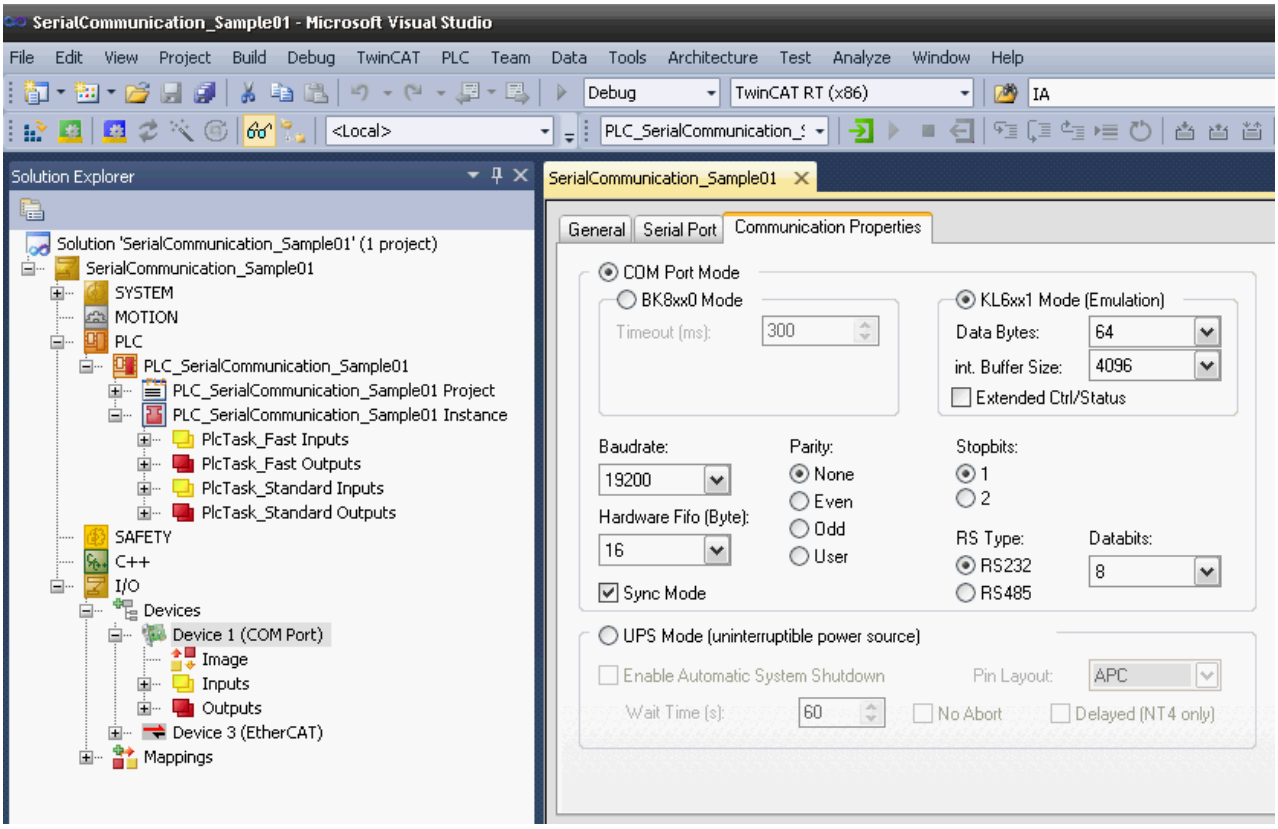
4.1.5 Serial PC Interface

The PC's standard serial interface is entered into the I/O configuration as a new I/O device.



After this the interface is configured:





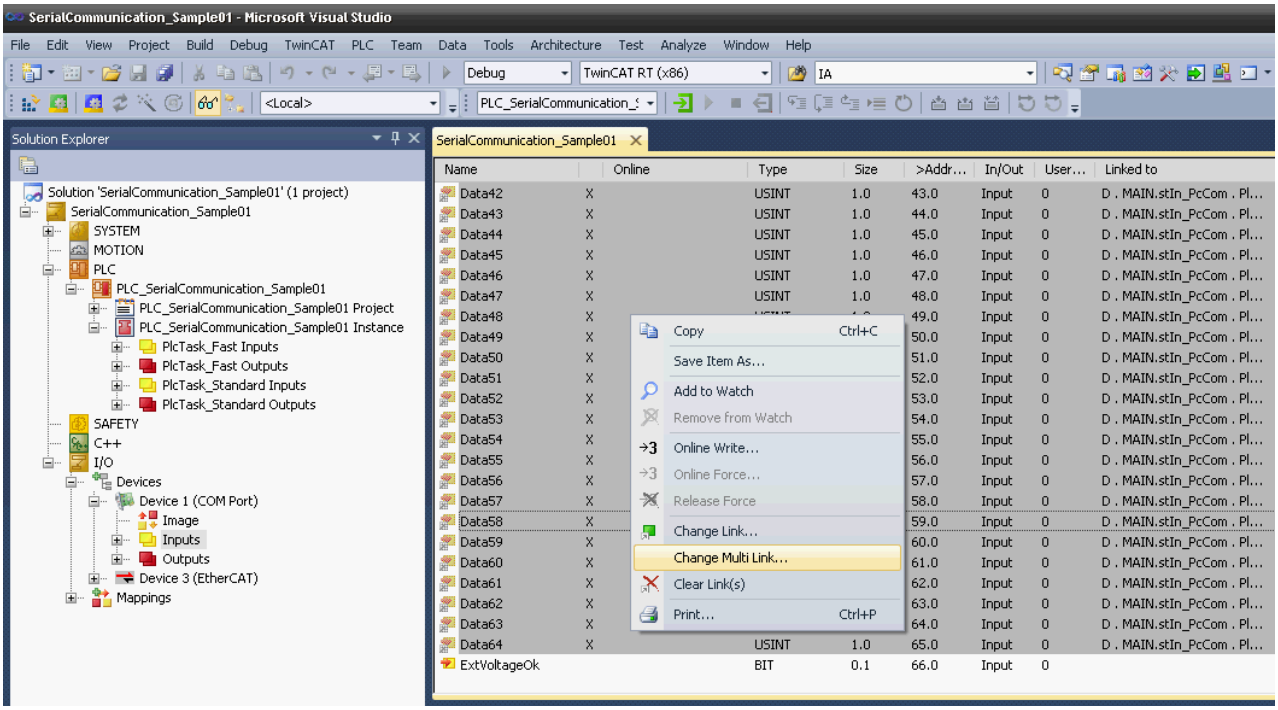
Only the KL6xx1 emulation operation is supported. **Data bytes** must be set to **64 bytes**. The interface parameters are set appropriately in the application.

Sync mode: In *Sync mode*, communication with the interface hardware is synchronised with the communication task. This setting usually offers benefits at high baud rates, as long the cycle time of the communication task is short enough. At 115 kBaud, for example, 12 characters are received each millisecond. The interface therefore has to be operated with a maximum cycle time of 1 ms, in order to avoid overflow of the 16-byte hardware FIFO. If the cycle times are too long, there is a risk of buffer overflow.

If *Sync mode* is switched off, the interface is served via the Windows timer interrupt every millisecond, irrespective of the task cycle time. This mode is not real-time capable, and with high computer utilisation longer operating intervals may be experienced. In this case, with very high baud rates there is also a risk of buffer overflow.

It is recommended to activate *Sync mode* and to adjust the cycle time of the communication task to the baud rate in such a way that overflow of the 16-byte hardware buffer is avoided. For smaller baud rates and with a slower communication task, *Sync mode* may perhaps be deactivated.

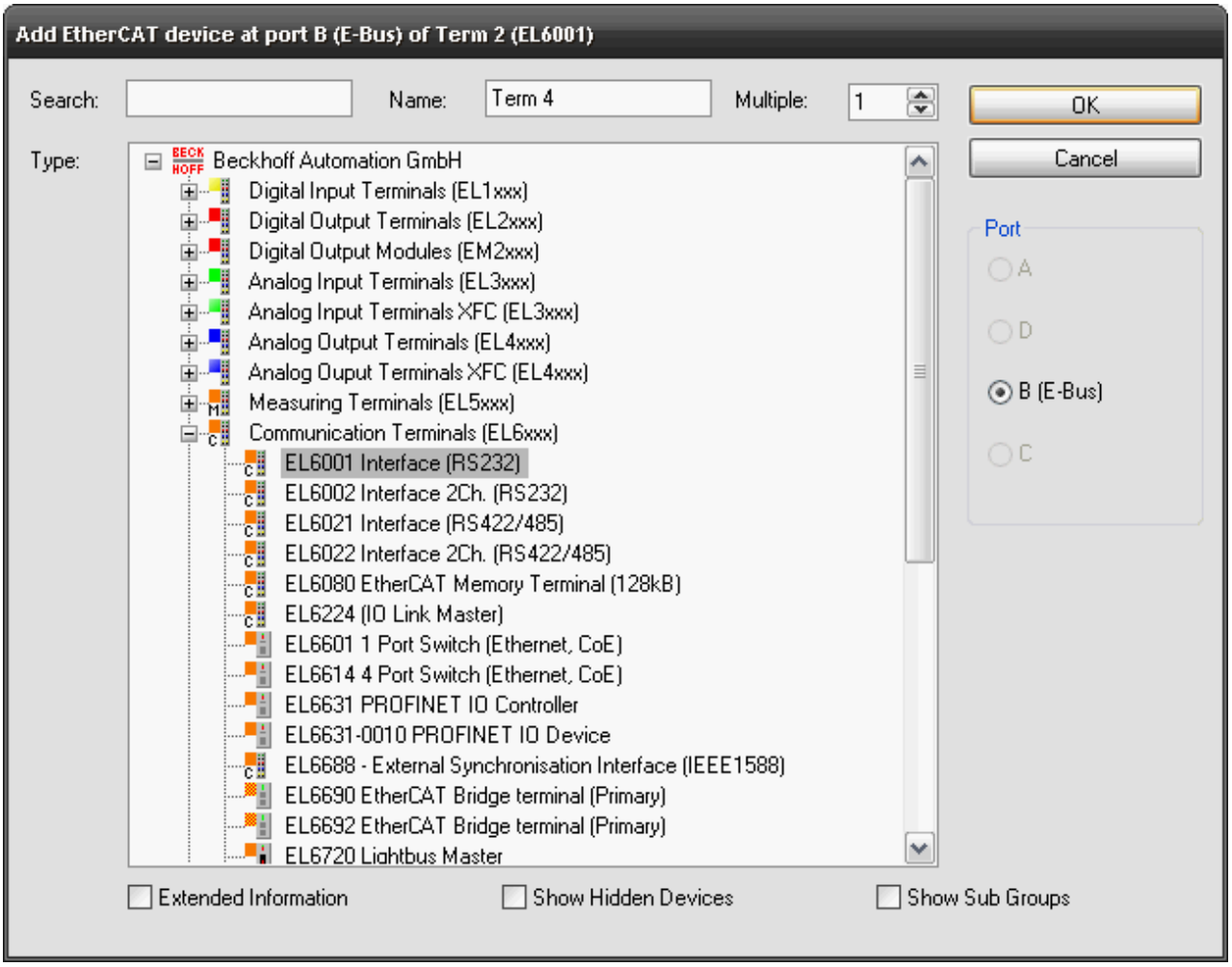
The next step is to link the inputs and outputs to the corresponding data structures in the PLC (types PcComInData [▶ 69] and PcComOutData [▶ 69]) by means of multiple linking.



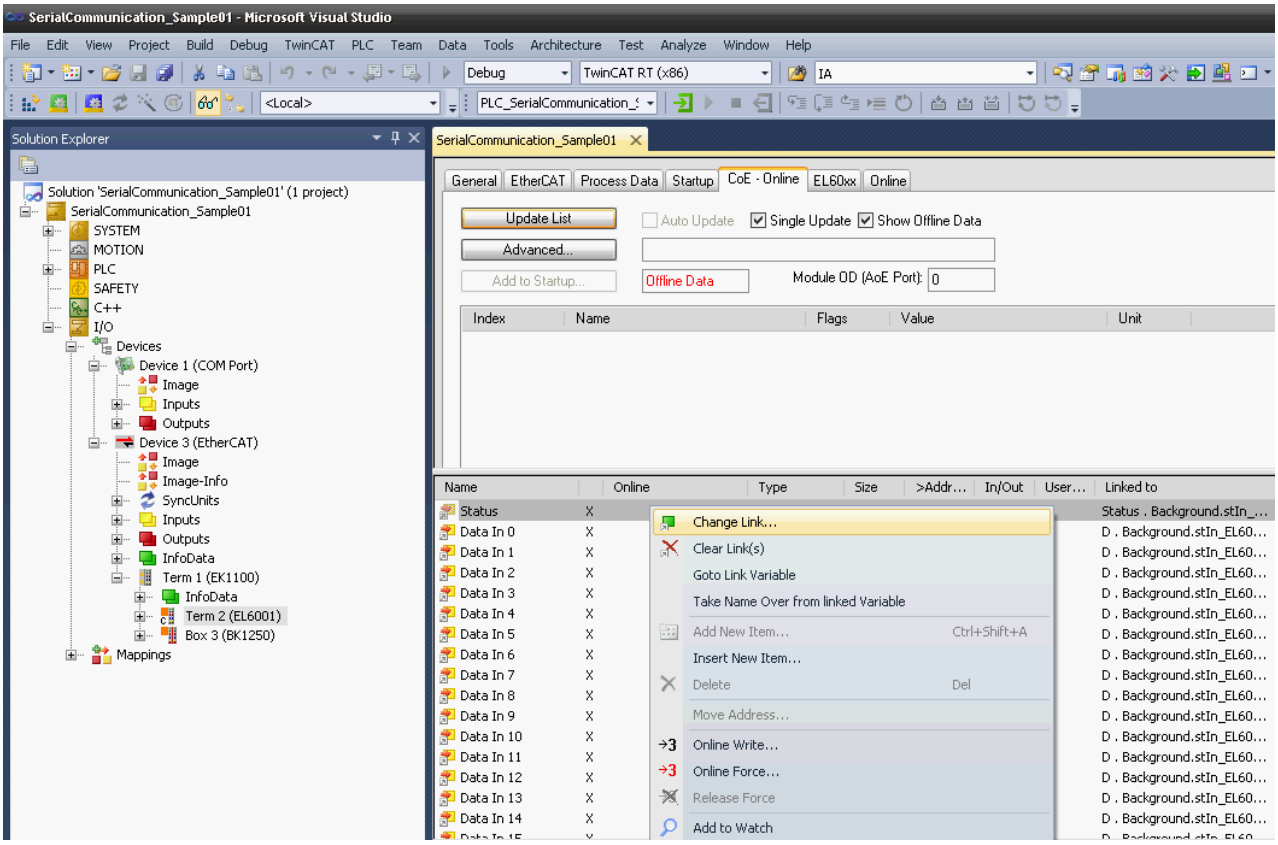
The new configuration is activated, and the system is restarted.

4.1.6 Serial EtherCAT Terminal

The serial EtherCAT terminal is entered into the system under a EtherCAT coupler.



Then the input and output data is linked with the corresponding PLC variables (of types EL6inData22B [▶ 69] bzw. EL6outData22B [▶ 69]).



The new configuration is activated, and the system is restarted.

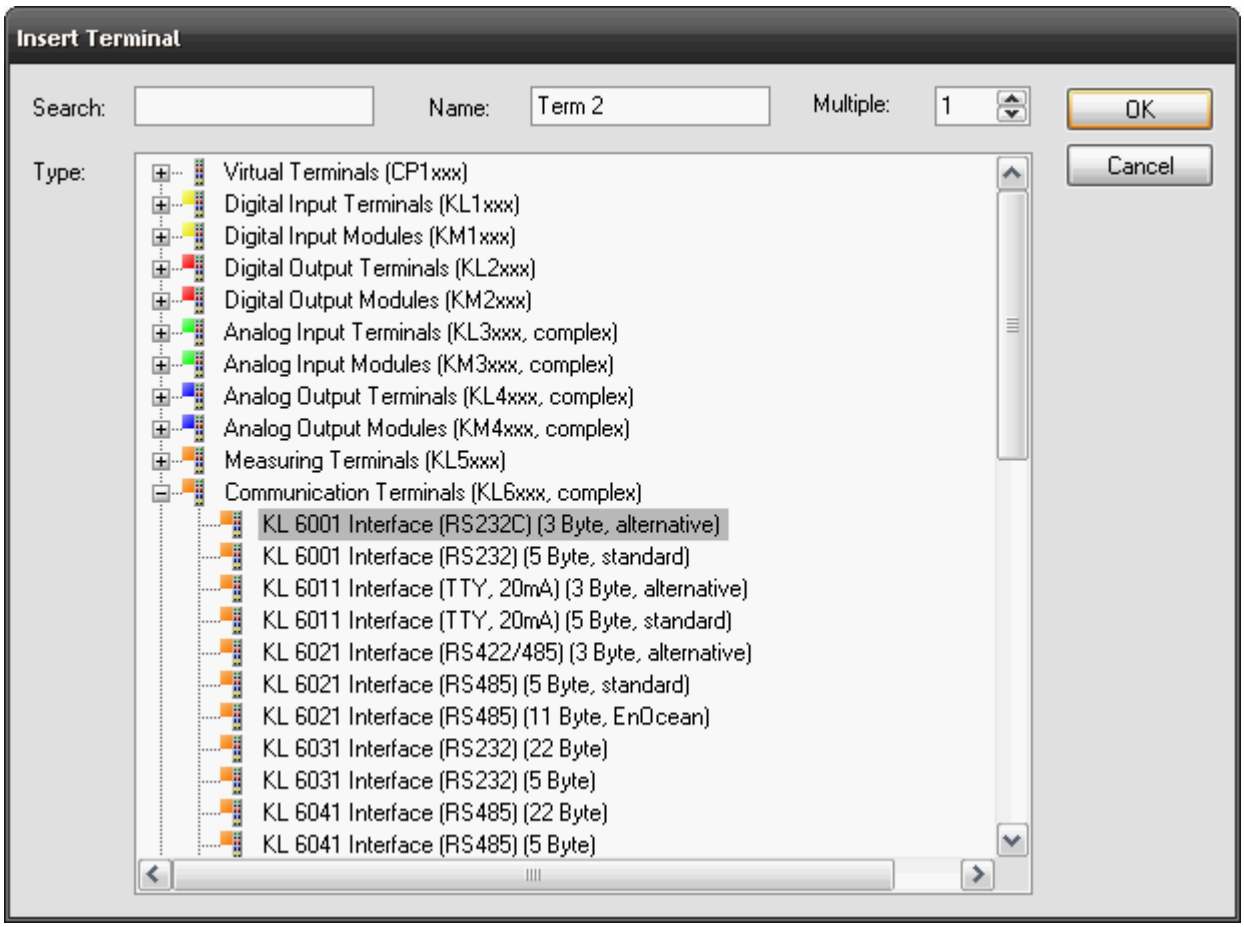
The serial settings are typically already set in the system configuration in the CoE of the EtherCAT terminal. Recommended is the insertion of these values into the startup-list to facilitate a hardware exchange.

The serial settings can be configured via CoE at run time too.

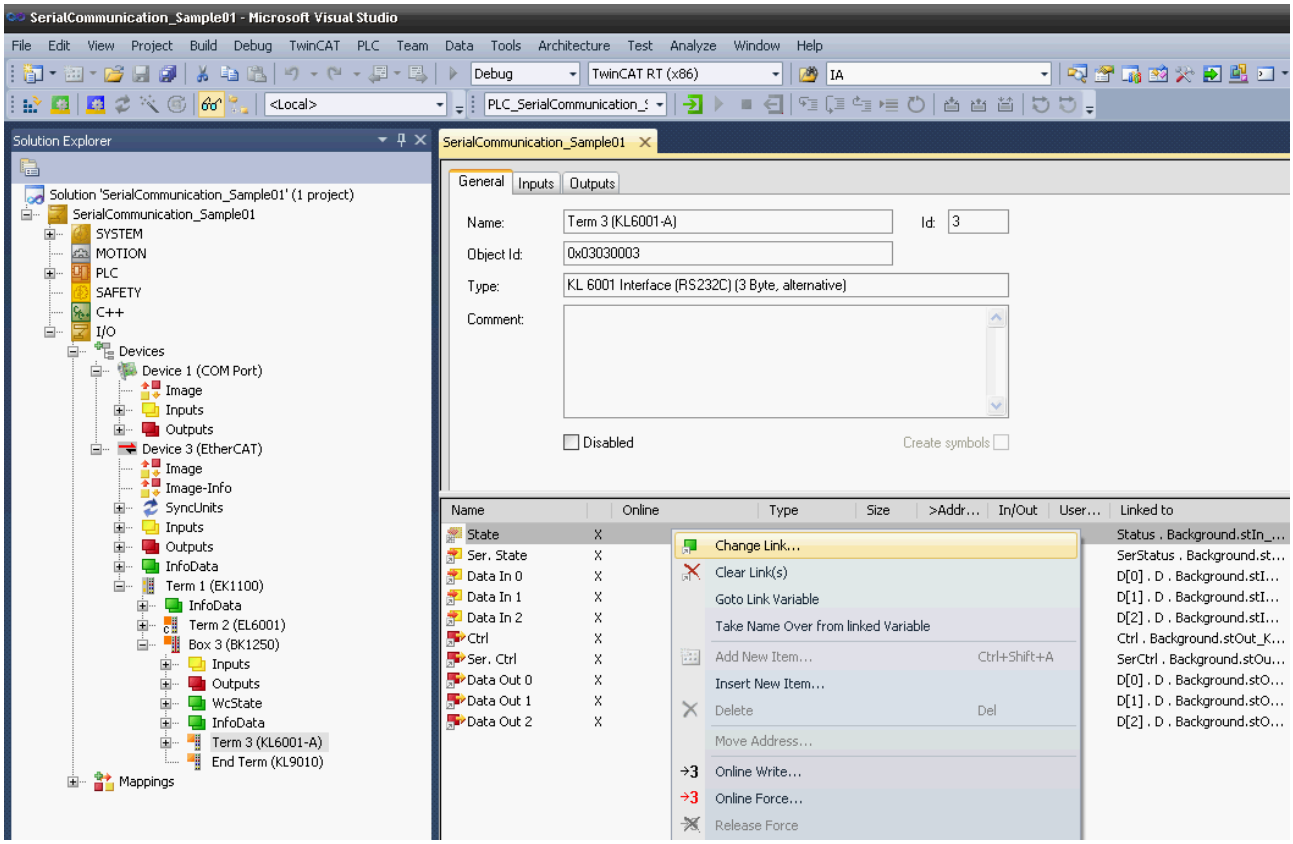
4.1.7 Serial Bus Terminal

KL6xxx in 3-Byte Mode

The serial bus terminal is entered into the system under a bus coupler.



Then the input and output data is linked with the corresponding PLC variables (of types KL6inData [▶ 67] and KL6outData [▶ 67]).

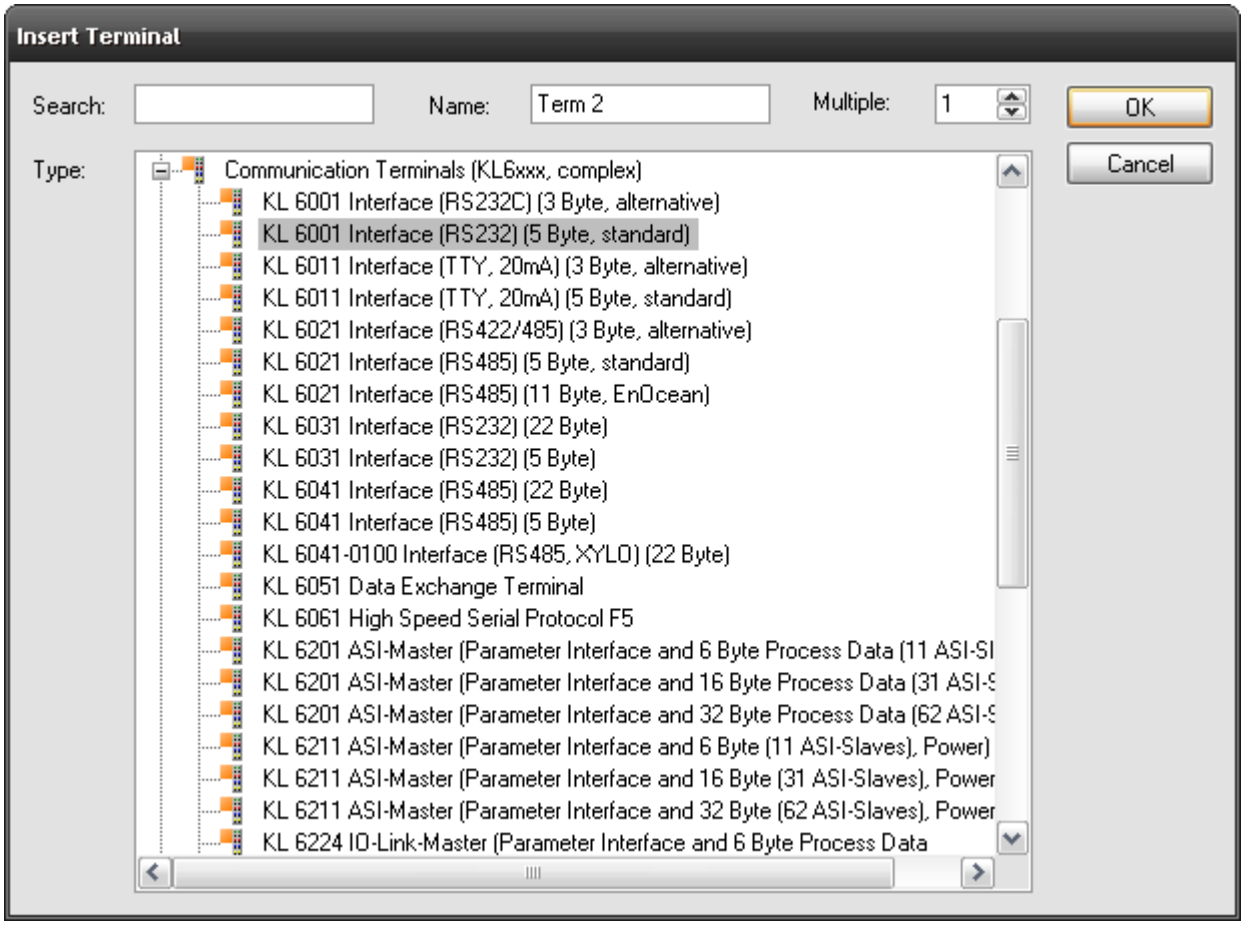


The new configuration is activated, and the system is restarted.

KL6xxx in 5-Byte Mode

Before a KL6xxx bus terminal can be used in 5-byte mode, it must be appropriately reconfigured. This can not be done through ComLib while running, but must be performed with the Beckhoff KS2000 configuration program. The terminal is then permanently set for 5-byte mode.

The serial bus terminal is now entered into the system under a bus coupler.



Then the input and output data are individually linked to the corresponding PLC variables (of types KL6inData5B [▶ 68] and KL6outData5B [▶ 68]).

The new configuration is activated, and the system is restarted.

4.2 Supported Hardware

The maximum effective data transfer rate (Bps) depends on the cycle time (T) of the PLC and the number of bits per transferred data byte (LB = 1 start bit + n data bits + p parity bits + m stop bits).
The maximum effective data transfer rate is limited upwards by the physical baud rate programmed in the bus terminal.

Example 1: When using an EL6001 terminal and a baud rate of 9600 baud, a cycle time of maximum 6 ms is necessary.
Example 2: When using a PC COM port and a baud rate of 115200 baud, a cycle time of maximum 2 ms is necessary.

Serial EtherCAT Terminals

EL60xx in 22-byte mode (EP60xx im 22-byte mode)

The serial EtherCAT Terminal is operated in 22-byte mode, so that 22 data bytes can be transferred to and from the terminal. 3 PLC cycles are still necessary for each exchange.

Bps = (LB * 22/3) / T

The terminal is parameterized via the CoE Online tab in the TwinCAT System Manager (double-click the corresponding object).

Serial PC Interface

The serial physical PC interface (COM1, COM2, etc.) is handled by the TwinCAT system similarly to the serial bus terminal and EtherCAT Terminal and uses larger data transfer buffers than the serial Bus Terminal. The library uses a 64-byte buffer, so that up to 64 data bytes can be transferred simultaneously between the PLC and the interface driver. 3 PLC cycles are again needed for the exchange of a data block with the serial PC interface.

Bps = (LB * 64/3) / T

Virtual serial COM port

The TwinCAT system also supports a virtual serial COM port (COM1, ..., COM255), which is available in Windows. In the TwinCAT/BSD operating system the COM port must register as `ttyU0`...`ttyU255` to be supported. In the Beckhoff RT Linux® operating system, the COM port must register as `ttyUSB0`...`ttyUSB255` or `ttyACM0`...`ttyACM255` in order to be supported.

No configuration of the process image in the TwinCAT System Manager is required. The parameterization takes place directly in the PLC using the function blocks provided.

This communication connection is not real-time capable.

The baud rate can be set between 150 baud and 128000 baud. Typical, frequently used baud rates are 9600 or 115200 baud.

One port per target system

The product is designed for use with a single virtual COM port per target system. However, in principle it is possible to use of several virtual COM ports on one system, provided function tests are carried out.

Serial bus terminal

KL6xxx in 3-byte mode

The standard version of the serial Beckhoff Bus Terminal is operated in 3-byte mode. In other words, a bus telegram can transmit or receive 3 data bytes to or from the terminal. Since every data exchange between the PLC and the bus terminal requires 3 PLC cycles, the effective transfer rate is one byte per cycle.

Bps = LB / T

In the case of bus terminals, the K-bus update time of the bus coupler must be considered when selecting the cycle time (see Task configuration [▶ 22]).

KL6xxx in 5-byte mode

The serial bus terminal can be reprogrammed offline by means of a configuration program (Beckhoff KS2000), so that, in 5-byte mode, 5 data bytes can be transferred to or from the terminal. 3 PLC cycles are still necessary for each exchange. The effective data rate for a given cycle time of the PLC is thus 5/3 greater than in 3-byte mode.

Bps = (LB * 5/3) / T

The bus terminals cannot be re-programmed while the PLC is running, since the 3-byte and 5-byte modes differ in the register mapping and in the TwinCAT System Manager configuration.

In the case of bus terminals, the K-bus update time of the bus coupler must be considered when selecting the cycle time (see Task configuration [▶ 22]).

KL6xxx in 22-byte mode

The serial bus terminal can be supplied with a 24-byte process image as a special type, so that 22 data bytes can be transferred to and from each terminal. 3 PLC cycles are still necessary for each exchange.

Bps = (LB * 22/3) / T



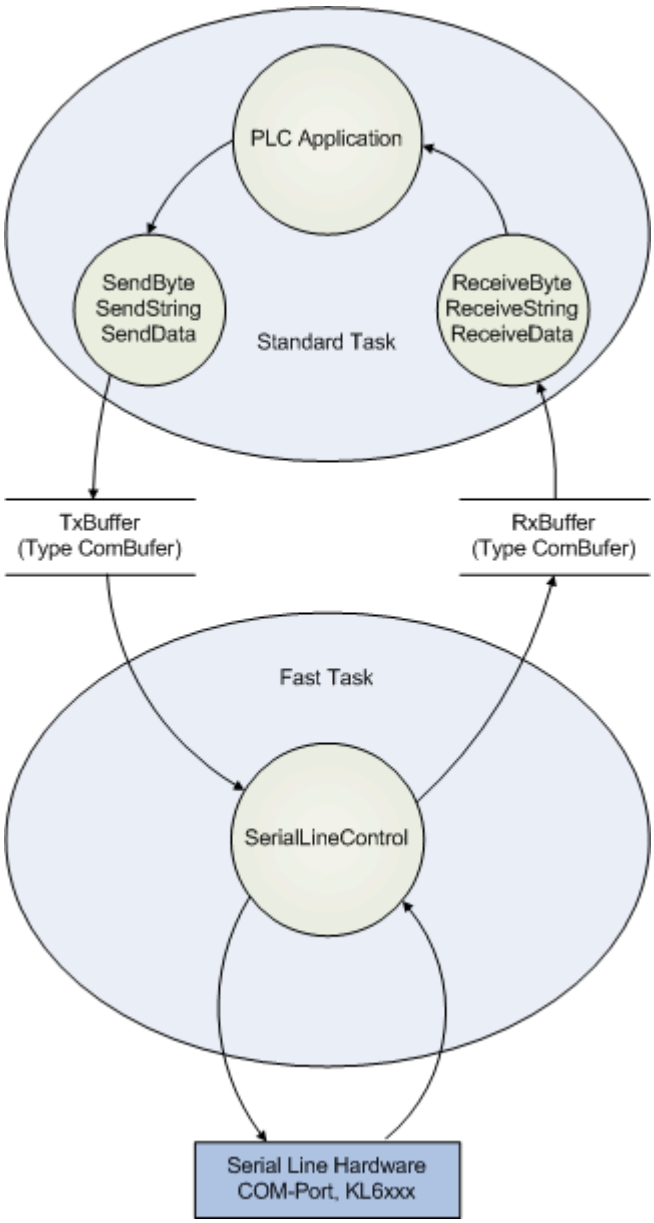
In the case of bus terminals, the K-bus update time of the bus coupler must be considered when selecting the cycle time (see Task configuration [▶ 22]).

4.3 Communication Principle

Background Communication

As described in the section on Supported Hardware [▶ 29], the maximum effective data transfer rate depends in part on the PLC cycle time. So, for example, for communication with the serial bus terminal at an effective rate of 9600 bps, a cycle time of 1 ms is required. In many larger applications such a short cycle time for the whole PLC would heavily load the control computer.

Since for most applications longer cycle times of, for instance, 10 ms are more than adequate, it is possible with the aid of this library to decouple the data traffic between the PLC and the hardware from the rest of the PLC application. Two tasks are created in the PLC program for this purpose. The standard task runs with the conveniently long PLC cycle time of, for example, 10 ms, while a second communication task runs with a faster cycle taking, for example, 2 ms.



Data buffers of type ComBuffer [▶ 64] are used to decouple the different speeds of the fast communication task and the standard task. They are written and read asynchronously.

The function blocks described later for receiving and sending data (SendByte [▶ 40], SendString [▶ 42], SendData [▶ 41] etc.) make use of only an additional data buffer for data exchange, and are thus independent of the hardware being used. In all cases, a communication block SerialLineControl [▶ 51] is called in the fast task, as well as the send and receive blocks. This handles the data traffic between the data buffer and the hardware with maximum speed in the background. If a COM port or terminal with 22 byte data interface is used a second task is not needed for low baud rates. Then the communication block SerialLineControl [▶ 51] can be called in the standard task.

The communication with virtual COM ports via SerialLineControlADS [▶ 52] uses an ADS server. Data exchange is handled asynchronously via ADS and is managed in intermediate buffers. The server itselfs receives the incoming data of the virtual COM port independent of the PLC. So the maximal effective data transfer don't depend on the PLC task cycle time.
Only the reaction time for incoming data would be decreased by a faster task cycle time. The full delay can't be defined because the virtual-com-port-drivers and the ADS server do not run in realtime.
The communication block *SerialLineControlADS* usually is called in the standard task. A second task is not needed.

5 PLC API

5.1 Function blocks

5.1.1 Send + Receive

5.1.1.1 ReceiveByte



The function block ReceiveByte receives a single character from the interface corresponding to the input variable RxBuffer.

Inputs/outputs

```
VAR_IN_OUT
  RXBuffer          : ComBuffer;
END_VAR
```

Name	Type	Description
RxBuffer	ComBuffer [▶ 64]	Receive data buffer corresponding to the interface in use.

Outputs

```
VAR_OUTPUT
  ByteReceived       : BOOL;
  ReceivedByte       : BYTE;
  Error              : ComError_t;
END_VAR
```

Name	Type	Description
ByteReceived	BOOL	If ByteReceived=TRUE after the call, then the data byte received is available in the output variable ReceivedByte. Otherwise no data has been received.
ReceivedByte	BYTE	If ByteReceived=TRUE after the call, then the data byte received is available in the output variable ReceivedByte. Otherwise no data has been received.
Error	ComError_t [▶ 75]	If a fault occurs, Error will contain an error code.

Sample

Whenever a the function block ReceiveByte is processed in a PLC task that is running slower than the communication with the hardware, it must be observed that more than one character can be made available in each PLC cycle. The characters received should therefore be read out within a loop:

```
REPEAT
Receive(RXbuffer:=RXbuffer);
IF Receive.ByteReceived THEN
(* Zeichen auswerten *)
END_IF
UNTIL NOT Receive.ByteReceived
END_REPEAT
```

The number of passes through the loop is inevitably limited by the size of the receive data buffer (presently 300 bytes), so that an infinite loop need not be feared.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.2 ReceiveData



ReceiveData receives data of any type from the interface corresponding to the input variable **RxBuffer**, storing it in the ReceiveData variable. The start and end of the data stream are recognized by various mechanisms, which can be combined with one another:

- **Prefix**

  If a variable is passed to the input variable prefix, the first characters of the received data must be the same as this prefix. Other characters are discarded. If no prefix is supplied (null), the receive data starts with the first received character.

- **Suffix**
  If an input variable Suffix is supplied, the input data is read until the end of the receive data agrees with the suffix. If the received data reach the maximum length SizeReceiveData, a COMERROR_DATASIZEOVERRUN error is generated.

- **Block size**
  If no suffix is specified, characters are received up to SizeReceiveData.

- **Timeout**
  If a timeout is passed to the function block, characters are received until a correspondingly large time gap follows a character. The receive data consists of the characters received up to that point. If timeout is 0, characters are received up to SizeReceiveData without time monitoring.

- **Suffix and timeout**
  If both a suffix and a timeout are passed, the input data is read until:
  - the end of the receive data matches the suffix. (DataReceived=TRUE)
  - the received data reaches the maximum length SizeReceiveData. (DataReceived=TRUE, Error=COMERROR_DATASIZEOVERRUN)
  - a character is followed by a correspondingly large time gap. The receive data consists of the characters received up to that point. (DataReceived=TRUE, RxTimeout=TRUE)

As soon as the output **DataReceived** becomes TRUE, the receive data is ready in the ReceiveData variable. The number of characters received is given in **LenReceiveData**.

Inputs

```
VAR_INPUT
  pPrefix         : POINTER TO BYTE;
  LenPrefix       : BYTE;
  pSuffix         : POINTER TO BYTE;
  LenSuffix       : BYTE;
  pReceiveData    : POINTER TO BYTE;
  SizeReceiveData : DINT;
  Timeout         : TIME;
  Reset           : BOOL;
END_VAR
```

Name	Type	Description
pPrefix	POINTER TO BYTE	pPrefix is the address of any kind of data structure that is passed to the function block using ADR(variable name). LenPrefix indicates the number of data bytes in the prefix.
LenPrefix	BYTE	LenPrefix indicates the number of data bytes in the prefix.
pSuffix	POINTER TO BYTE	pSuffix is the address of any kind of data structure that is passed to the function block using ADR(variable name).
LenSuffix	BYTE	LenSuffix indicates the number of data bytes in the suffix.
pReceiveData	POINTER TO BYTE	pReceiveData is the address of the receive data, and is found by means of ADR(receive data). The receive data is placed in the variables to which pReceiveData points.
SizeReceiveData	UDINT	SizeReceiveData is found by means of SIZEOF(receive data), and indicates the maximum size of the receive data.
Timeout	TIME	Timeout defines the maximum interval between two received characters. Timeout monitoring becomes effective after the first character. This means that timeout cannot be used to detect whether an expected telegram arrives or not. This is monitored externally.
Reset	BOOL	Setting the Reset input will reset the function block from the receive state into the initial state. Resetting is only necessary in exceptional cases, if, for example, the expected data could not be received and the function block remains busy.

Inputs/outputs

```
VAR_IN_OUT
  RXBuffer          : ComBuffer;
END_VAR
```

Name	Type	Description
RxBuffer	ComBuffer [▶ 64]	Receive data buffer corresponding to the interface in use.

Outputs

```
VAR_OUTPUT
  DataReceived    : BOOL;
  busy            : BOOL;
  Error           : ComError_t;
  RxTimeout       : BOOL;
  LenReceiveData  : UDINT;
END_VAR
```

Name	Type	Description
DataReceived	BOOL	DataReceived becomes TRUE as soon as the receive data is valid. The output remains TRUE for precisely one cycle, which means that it is necessary to evaluate the received data immediately.
Busy	BOOL	Busy becomes TRUE after the first character has been received, and goes FALSE as soon as the data has been received or an error or timeout has occurred.
Error	ComError_t [▶ 75]	If a fault occurs, Error will contain an error code.
RxTimeout	BOOL	RxTimeout becomes TRUE if the maximum interval between two received characters is exceeded. This causes data reception to be aborted, and the characters received up to this point are available. If a suffix is not being used, then detection of a timeout does not represent a fault, but indicates the normal end of the receive data. If, on the other hand, a suffix was being used, it was not possible to receive this. The timeout is not output as an error, but is only signaled via this output. In such a case DataReceived is nevertheless TRUE and LenReceivedData indicates the number of data received until the timeout. To evaluate only valid and complete receive data (incl. suffix), a query should check RxTimeout=FALSE and Error=COMERROR_NOERROR in addition to DataReceived=TRUE.
LenReceiveData	UDINT	LenReceiveData indicates the actual number of data bytes received, and can be less than or equal to SizeReceiveData. If prefix or suffix are used, they are also included in the receive data and LenReceiveData thus indicates the total number of received data bytes including prefix and suffix.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.3 ReceiveString



The function block ReceiveString receives a string of characters from the interface corresponding to the input variable **RxBuffer**, storing it in the output variable **ReceivedString**. The start and end of the character string are recognized by various mechanisms, which can be combined with one another.

Alternative

ReceivedString has a standard length of 80 characters. For some applications this length may be too short. In this case the function block ReceiveString255 [▶ 38] can be used. The only difference is a string length of 255 characters for the ReceivedString.

Inputs

```
VAR_INPUT
  Prefix          : STRING;
  Suffix          : STRING;
  Timeout         : TIME;
  Reset           : BOOL;
END_VAR
```

Name	Type	Description
Prefix	STRING	If a string is supplied to the input variable Prefix, the first characters must correspond to this prefix. Other characters are discarded. If no prefix is supplied (an empty string), the received string starts with the first received character.
Suffix	STRING	If a string is supplied to the input variable Suffix, the input data is read until the end of the received string corresponds to the suffix. If during this process the received data reach the maximum length of the receive string, a COMERROR_STRINGOVERRUN error is generated. If an empty string is supplied as the suffix, a timeout must be defined instead, since otherwise the end of the character string cannot be recognized.
Timeout	TIME	If a timeout is supplied to the function block, then characters will be received until a correspondingly long interval has elapsed after reception of a character. The received string consists of the characters received up to that point. Suffix and timeout may be combined. If a suffix is supplied, the timeout may be 0.
Reset	BOOL	Setting the Reset input will reset the function block from the receive state into the initial state. Resetting is only necessary in exceptional cases, for example if the expected string could not be received and the function block remains busy.

Inputs/outputs

```
VAR_IN_OUT
  ReceivedString   : STRING;
  RXBuffer         : ComBuffer;
END_VAR
```

Name	Type	Description
ReceivedString	STRING	As soon as the StringReceived output becomes TRUE, the received character string is available in the ReceivedString variable.
RxBuffer	ComBuffer [▶ 64]	Receive data buffer corresponding to the interface in use.

Outputs

```
VAR_OUTPUT
  StringReceived  : BOOL
  busy            : BOOL;
  Error           : ComError_t;
  RxTimeout       : BOOL;
END_VAR
```

Name	Type	Description
StringReceived	BOOL	As soon as the StringReceived output becomes TRUE, the received character string is available in the ReceivedString variable.
busy	BOOL	Busy becomes TRUE after the first character has been received, and goes FALSE as soon as the data has been received or an error or timeout has occurred.
Error	ComError_t [▶ 75]	If a fault occurs, Error will contain an error code.
RxTimeout	BOOL	RxTimeout becomes TRUE if the maximum interval between two received characters is exceeded. This causes data reception to be aborted, and the characters received up to this point are available. If a suffix is not being used, then detection of a timeout does not represent a fault, but indicates the normal end of the receive data. If, on the other hand, a suffix was being used, it was not possible to receive this. The timeout is not output as an error, but is only signaled via this output. In such a case DataReceived is nevertheless TRUE and LenReceivedData indicates the number of data received until the timeout. To evaluate only valid and complete receive data (incl. suffix), a query should check RxTimeout=FALSE and Error=COMERROR_NOERROR in addition to DataReceived=TRUE.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.4 ReceiveString255



The function block **ReceiveString** receives a string of characters from the interface corresponding to the input variable **RxBuffer**, storing it in the output variable **ReceivedString**. The start and end of the character string are recognized by various mechanisms, which can be combined with one another.

Inputs

```
VAR_INPUT
  Prefix          : STRING;
  Suffix          : STRING;
  Timeout         : TIME;
  Reset           : BOOL;
END_VAR
```

Name	Type	Description
Prefix	STRING	If a string is supplied to the input variable Prefix, the first characters must correspond to this prefix. Other characters are discarded. If no prefix is supplied (an empty string), the received string starts with the first received character.
Suffix	STRING	If a string is supplied to the input variable Suffix, the input data is read until the end of the received string corresponds to the suffix. If during this process the received data reach the maximum length of the receive string, a COMERROR_STRINGOVERRUN error is generated. If an empty string is supplied as the suffix, a timeout must be defined instead, since otherwise the end of the character string cannot be recognized.
Timeout	TIME	If a timeout is supplied to the function block, then characters will be received until a correspondingly long interval has elapsed after reception of a character. The received string consists of the characters received up to that point. Suffix and timeout may be combined. If a suffix is supplied, the timeout may be 0.
Reset	BOOL	Setting the Reset input will reset the function block from the receive state into the initial state. Resetting is only necessary in exceptional cases, for example if the expected string could not be received and the function block remains busy.

Inputs/outputs

```
VAR_IN_OUT
  ReceivedString   : STRING(255);
  RXBuffer         : ComBuffer;
END_VAR
```

Name	Type	Description
ReceivedString	STRING (255)	As soon as the StringReceived output becomes TRUE, the received character string is available in the ReceivedString variable.
RxBuffer	ComBuffer [▶ 64]	Receive data buffer corresponding to the interface in use.

Outputs

```
VAR_OUTPUT
  StringReceived  : BOOL
  busy            : BOOL;
  Error           : ComError_t;
  RxTimeout       : BOOL;
END_VAR
```

Name	Type	Description
StringReceived	BOOL	As soon as the StringReceived output becomes TRUE, the received character string is available in the ReceivedString variable.
busy	BOOL	Busy becomes TRUE after the first character has been received, and goes FALSE as soon as the data has been received or an error or timeout has occurred.
Error	ComError_t [▶ 75]	If a fault occurs, Error will contain an error code.
RxTimeout	BOOL	RxTimeout becomes TRUE if the maximum interval between two received characters is exceeded. This causes data reception to be aborted, and the characters received up to this point are available. If a suffix is not being used, then detection of a timeout does not represent a fault, but indicates the normal end of the receive data. If, on the other hand, a suffix was being used, it was not possible to receive this. The timeout is not output as an error, but is only signaled via this output. In such a case DataReceived is nevertheless TRUE and LenReceivedData indicates the number of data received until the timeout. To evaluate only valid and complete receive data (incl. suffix), a query should check RxTimeout=FALSE and Error=COMERROR_NOERROR in addition to DataReceived=TRUE.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.5 SendByte



`SendByte` sends a single character to the interface that corresponds to the input variable `TxBuffer` (of type ComBuffer [▶ 64]).

As long as the send data buffer can still accept data, more than one character can be sent in a single PLC cycle. This is, however, only worthwhile if the buffered characters will be transmitted to the hardware by a faster communication task.

Inputs

```
VAR_INPUT
  SendByte          : BYTE;
END_VAR
```

Name	Type	Description
SendByte	BYTE	Das zu sendende Zeichen/Byte.

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer         : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	Send data buffer that corresponds to the interface used.

Outputs

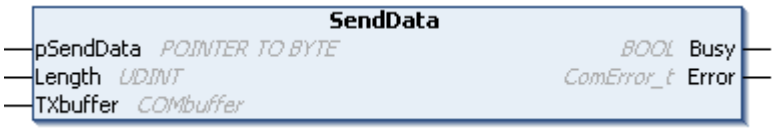
```
VAR_OUTPUT
  Busy            : BOOL;
  Error           : ComError_t;
END_VAR
```

Name	Type	Description
Busy	BOOL	For as long as the output `Busy=TRUE`, the transmission is not completed. The character was successfully sent when `Busy=FALSE` and Error=0. The output `Busy` does not become TRUE, if the character could already be sent with the first call.
Error	ComError_t [▶ 75]	If a fault occurs, `Error` will contain an error code.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.6 SendData



SendData sends the content of a variable of any type to the interface that corresponds to the input variable **TxBuffer** (of type ComBuffer [▶ 64]).

Inputs

```
VAR_INPUT
  pSendData          : POINTER TO BYTE;
  Length             : UDINT;
END_VAR
```

Name	Type	Description
pSendData	POINTER TO BYTE	pSendData is the address of the send data, and is determined by means of ADR(send data). The send data may not be changed as long as Busy=TRUE and the data has not yet been sent completely.
Length	UDINT	Length is the number of data bytes to be sent, and can be smaller than or equal to the size of the data structure being used. If the entire contents of a variable are to be sent, then the length can be determined using SIZEOF(send data).

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer        : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	Send data buffer that corresponds to the interface used.

Outputs

```
VAR_OUTPUT
  Busy            : BOOL;
  Error           : ComError_t;
END_VAR
```

Name	Type	Description
Busy	BOOL	For as long as the output `Busy=TRUE`, the transmission is not completed. The data has successfully been sent when `Busy=FALSE` and `Error=0`. The output Busy does not become TRUE, if the data could already be sent with the first call. `Busy` becomes FALSE as soon as the data has been sent or an error or timeout has occurred.
Error	ComError_t [▶ 75]	If a fault occurs, `Error` will contain an error code.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.7 SendString



SendString sends a character string to the interface that corresponds to the input variable **TxBuffer** (of type ComBuffer [▶ 64]).

Alternative

SendString has a standard length of 80 characters. For some applications a longer string is desirable. In this case the function block SendString255 [▶ 43] can be used. The only difference is a string length of 255 characters compared to SendString.

Inputs

```
VAR_INPUT
  SendString        : STRING;
END_VAR
```

Name	Type	Description
SendString	STRING	The character string to be sent.

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer          : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	Send data buffer that corresponds to the interface used.

Outputs

```
VAR_OUTPUT
  Busy            : BOOL;
  Error           : ComError_t;
END_VAR
```

Name	Type	Description
Busy	BOOL	For as long as the output `Busy=TRUE`, the transmission is not completed. The data has successfully been sent when `Busy=FALSE` and `Error=0`. The output Busy does not become TRUE, if the data could already be sent with the first call. `Busy` becomes FALSE as soon as the data has been sent or an error or timeout has occurred.
Error	ComError_t [▶ 75]	If a fault occurs, `Error` will contain an error code.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.8 SendString255



SendString sends a character string to the interface that corresponds to the input variable **TxBuffer** (of type ComBuffer [▶ 64]).

Inputs

```
VAR_INPUT
  SendString         : STRING(255);
END_VAR
```

Name	Type	Description
SendString	STRING (255)	The character string to be sent.

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer         : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	Send data buffer that corresponds to the interface used.

Outputs

```
VAR_OUTPUT
  Busy             : BOOL;
  Error            : ComError_t;
END_VAR
```

Name	Type	Description
Busy	BOOL	For as long as the output `Busy=TRUE`, the transmission is not completed. The data has successfully been sent when `Busy=FALSE` and `Error=0`. The output Busy does not become TRUE, if the data could already be sent with the first call. `Busy` becomes FALSE as soon as the data has been sent or an error or timeout has occurred.
Error	ComError_t [▶ 75]	If a fault occurs, `Error` will contain an error code.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.1.9 ClearComBuffer



The internal PLC communication **Buffer** (of type ComBuffer [▶ 64]) is cleared.

Inputs/outputs

```
VAR_IN_OUT
  Buffer         : ComBuffer;
END_VAR
```

Name	Type	Description
Buffer	ComBuffer [▶ 64]	The internal PLC communication buffer to be cleared.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.2 Configuration

5.1.2.1 ComReset



ComReset resets the connected serial hardware. This clears the internal hardware send and receive buffers. The function block supports a variety of serial hardware, such as the serial PC interface and the serial Bus Terminals KL6xxx.

The function block does not clear the data buffer of type ComBuffer [▶ 64] internal to the PLC. For initialization purposes, this can be separately cleared with the function block ClearComBuffer [▶ 44].

Inputs

```
VAR_INPUT
  Execute          : BOOL
  pComIn           : POINTER TO BYTE;
  pComOut          : POINTER TO BYTE;
  SizeComIn        : UINT;
END_VAR
```

Name	Type	Description
Execute	BOOL	A rising edge at the Execute input resets the connected serial hardware.
pComIn	POINTER TO BYTE	Universal pointer to the input variable of the process data for the serial hardware (data types KL6inData [▶ 67], KL6inData5b [▶ 67], PcComInData [▶ 69]). The pointer is assigned with the *ADR*() function.
pComOut	POINTER TO BYTE	Universal pointer to the output variable of the process data for the serial hardware (data types: KL6outData [▶ 67], KL6outData5b [▶ 67], PcComOutData [▶ 69]). The pointer is assigned with the *ADR*() function.
SizeComIn	UINT	Size of the input process image of the serial hardware being used. The size is determined and assigned with the *SIZEOF*() function.

Outputs

```
VAR_OUTPUT
  Done        : BOOL;
  Busy        : BOOL;
  Error       : BOOL;
  ErrorID     : ComError_t;
END_VAR
```

Name	Type	Description
Done	BOOL	The Done output becomes TRUE when the function has been carried out without error.
Busy	BOOL	The Busy output becomes TRUE in response to rising edge at Execute, and remains TRUE for as long as the function block is performing its function.
Error	BOOL	This output *Error* goes TRUE as soon as an error occurs.
ErrorID	ComError_t [▶ 70]	The *ErrorID* output provides an error code when an error occurs.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.2.2 KL6Configuration



The function block KL6Configuration initializes and configures a serial Bus Terminal KL6xxx.

The function block uses the standard register communication for KL Terminals for the configuration. For EtherCAT Terminals EL this register communication is not available. EL Terminals can be configured with function blocks from the EtherCAT library (FB_EcCoeSdoWrite).

Inputs

```
VAR_INPUT
  Execute          : BOOL;
  Mode             : ComSerialLineMode_t;
  Baudrate         : UDINT;
  NoDatabits       : BYTE;
  Parity           : ComParity_t;
  Stopbits         : BYTE;
  Handshake        : ComHandshake_t;
  ContinousMode    : BOOL;
  pComIn           : POINTER TO BYTE;
  pComOut          : POINTER TO BYTE;
  SizeComIn        : UINT
END_VAR
```

Name	Type	Description
Execute	BOOL	A rising edge at the Execute input resets the connected serial hardware.
Mode	ComSerialLineMode_t [▶ 72]	The Mode input specifies unambiguously which serial hardware is being used.
Baud rate	UDINT	The baud rate, provided it is supported by the serial hardware. `115200, 57600, 38400, 19200, 9600, 4800, 2400, 1200`
NoDatabits	BYTE	The number of user data bits in one data byte. `7 or 8`
Parity	ComParity_t [▶ 71]	The type of the parity bit in a data byte. `PARITY_NONE=0, PARITY_EVEN=1, PARITY_ODD=2`
Stop bits	BYTE	The number of stop bits per data byte. `1 or 2`
Handshake	ComHandshake_t [▶ 71]	The type of handshake used, provided it is supported by the serial hardware. `HANDSHAKE_NONE=0, HANDSHAKE_RTSCTS=1, HANDSHAKE_XONXOFF=2`
ContinousMode	BOOL	Switches on continuous transmission, provided this is supported by the serial hardware. If ContinousMode is TRUE, transmitted data is not sent out by the serial hardware until the hardware transmit buffer is full. This means that there are no time gaps in the transmission, provided the quantity of data is similar in size to the hardware transmit buffer. Continuous mode is only necessary in special cases in which the end device reacts to time gaps with a time-out.
pComIn	POINTER TO BYTE	Universal pointer to the input variable of the process data for the serial hardware (data types: KL6inData [▶ 67], KL6inData5b [▶ 68], KL6inData22b [▶ 68], PcComInData [▶ 69]). The pointer is assigned with the *ADR*() function.
pComOut	POINTER TO BYTE	Universal pointer to the output variable of the process data for the serial hardware (data types: KL6outData [▶ 67], KL6outData5b [▶ 68], KL6outData22b [▶ 68], PcComOutData [▶ 69]). The pointer is assigned with the *ADR*() function.
SizeComIn	UINT	Size of the input process image of the serial hardware being used. The size is determined and assigned with the SIZEOF() function.

Outputs

```
VAR_OUTPUT
  Done       : BOOL;
  Busy       : BOOL;
  Error      : BOOL;
  ErrorID    : ComError_t;
END_VAR
```

Name	Type	Description
Done	BOOL	The Done output becomes TRUE when the function has been carried out without error.
Busy	BOOL	The Busy output becomes TRUE in response to rising edge at Execute, and remains TRUE for as long as the function block is performing its function.
Error	BOOL	This output *Error* goes TRUE as soon as an error occurs.
ErrorID	ComError_t [▶ 70]	The *ErrorID* output provides an error code when an error occurs.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.2.3 KL6ReadRegisters



The function block KL6ReadRegisters reads one or several registers of a serial Bus Terminal KL6xxx.

Inputs

```
VAR_INPUT
  Execute          : BOOL;
  FirstRegister    : UINT;
  RegisterCount    : UINT;
  Mode             : ComSerialLineMode_t;
  pComIn           : POINTER TO BYTE;
  pComOut          : POINTER TO BYTE;
  SizeComIn        : UINT;
  pRegisterList    : POINTER TO ARRAY[0..63] OF ComRegisterData_t;
  SizeRegisterList : UINT;
END_VAR
```

Name	Type	Description
Execute	BOOL	A rising edge at the Execute input starts the read process.
FirstRegister	UINT	Specifies the first register to be read. From this register number (which may range between 1 and 64), *RegisterCount* data are read and stored in the register list of type ComRegisterData_t [▶ 65]. If no coherent register range is to be read, the value 16#FFFF can be stored in *FirstRegister*. In this case the user has to initialize the register numbers to be read in the register list before the function block is triggered. In this case *RegisterCount* is not used.
RegisterCount	UINT	Specifies the number of registers to be read. The function block reads a coherent register range from FirstRegister and stores the data in the register list.
Mode	ComSerialLineMode_t [▶ 70]	The Mode input specifies unambiguously which serial hardware is being used.
pComIn	POINTER TO BYTE	Universal pointer to the input variable of the process data for the serial hardware (data types: KL6inData [▶ 67], KL6inData5b [▶ 68], KL6inData22b [▶ 68], PcComInData [▶ 69]). The pointer is assigned with the *ADR*() function.
pComOut	POINTER TO BYTE	Universal pointer to the output variable of the process data for the serial hardware (data types: KL6outData [▶ 67], KL6outData5b [▶ 68], KL6outData22b [▶ 68], PcComOutData [▶ 69]). The pointer is assigned with the *ADR*() function.
SizeComIn	UINT	Size of the input process image of the serial hardware being used. The size is determined and assigned with the *SIZEOF*() function.
pRegisterList	POINTER TO ARRAY[0..63] OF ComRegisterData_t [▶ 65]	Start address of a register list. The start address can be determined with ADR(register list).
SizeRegisterList	UINT	Size of the register list in bytes. The size can be determined via SIZEOF (register list). The list may have between 1 and 64 entries.

Outputs

```
VAR_OUTPUT
  Done       : BOOL;
  Busy       : BOOL;
  Error      : BOOL;
  ErrorID    : ComError_t;
END_VAR
```

Name	Type	Description
Done	BOOL	The Done output becomes TRUE when the function has been carried out without error.
Busy	BOOL	The Busy output becomes TRUE in response to rising edge at Execute, and remains TRUE for as long as the function block is performing its function.
Error	BOOL	This output *Error* goes TRUE as soon as an error occurs.
ErrorID	ComError_t [▶ 70]	The *ErrorID* output provides an error code when an error occurs.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.2.4 KL6WriteRegisters



The function block KL6WriteRegisters writes data to one or several registers of a serial Bus Terminal KL6xxx.

Inputs

```
VAR_INPUT
  Execute          : BOOL;
  Mode             : ComSerialLineMode_t;
  pComIn           : POINTER TO BYTE;
  pComOut          : POINTER TO BYTE;
  SizeComIn        : UINT;
  pRegisterList    : POINTER TO ARRAY[0..63] OF ComRegisterData_t;
  SizeRegisterList : UINT;
END_VAR
```

Name	Type	Description
Execute	BOOL	A rising edge at the Execute input starts the read process. The *register list* must be initialized before the function block is triggered. This means the register numbers and register content must be entered in the list.
Mode	ComSerialLineMode_t [▶ 70]	The Mode input specifies unambiguously which serial hardware is being used.
pComIn	POINTER TO BYTE	Universal pointer to the input variable of the process data for the serial hardware (data types: KL6inData [▶ 67], KL6inData5b [▶ 68], KL6inData22b [▶ 68], PcComInData [▶ 69]). The pointer is assigned with the *ADR*() function.
pComOut	POINTER TO BYTE	Universal pointer to the output variable of the process data for the serial hardware (data types: KL6outData [▶ 67], KL6outData5b [▶ 68], KL6outData22b [▶ 68], PcComOutData [▶ 69]). The pointer is assigned with the *ADR*() function.
SizeComIn	UINT	Size of the input process image of the serial hardware being used. The size is determined and assigned with the *SIZEOF*() function.
pRegisterList	POINTER TO ARRAY[0..63] OF ComRegisterData_t [▶ 65]	Start address of a register list. The start address can be determined with ADR(register list). The register list must be initialized before the function block is triggered. This means the register numbers and register content must be entered in the list.
SizeRegisterList	UINT	Size of the register list in bytes. The size can be determined via SIZEOF (register list). The list may have between 1 and 64 entries.

Outputs

```
VAR_OUTPUT
  Done       : BOOL;
  Busy       : BOOL;
  Error      : BOOL;
  ErrorID    : ComError_t;
END_VAR
```

Name	Type	Description
Done	BOOL	The Done output becomes TRUE when the function has been carried out without error.
Busy	BOOL	The Busy output becomes TRUE in response to rising edge at Execute, and remains TRUE for as long as the function block is performing its function.
Error	BOOL	This output *Error* goes TRUE as soon as an error occurs.
ErrorID	ComError_t [▶ 70]	The *ErrorID* output provides an error code when an error occurs.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.3 Background Communication

5.1.3.1 SerialLineControl



The SerialLineControl function block looks after the communication between a serial interface (KL60xx, EL60xx or COM interface) and the PLC. The function block is called cyclically, and places received data into the *RxBuffer*. Data made available in the *TxBuffer* transmit buffer is sent to the interface at the same time.

Because the function operates independently of the application, it is referred to as background communication and can, particularly in the case of serial bus terminals, also operate in a fast task (see Communication concept [▶ 31] and Supported hardware [▶ 29]).

Inputs

```
VAR_INPUT
  Mode             : ComSerialLineMode_t;
  pComIn           : POINTER TO BYTE;
  pComOut          : POINTER TO BYTE;
  SizeComIn        : INT;
END_VAR
```

Name	Type	Description
Mode	ComSerialLineMode_t [▶ 72]	The Mode input specifies unambiguously which serial hardware is being used.
pComIn	POINTER TO BYTE	Universal pointer to the input variable of the process data for the serial hardware (data types: PcComInData [▶ 69], EL6inData22b [▶ 69], KL6inData [▶ 67], KL6inData5b [▶ 68], KL6inData22b [▶ 68]). The pointer is assigned with the *ADR*() function.
pComOut	POINTER TO BYTE	Universal pointer to the output variable of the process data for the serial hardware (data types: PcComOutData [▶ 69], EL6outData22b [▶ 69], KL6outData [▶ 67], KL6outData5b [▶ 68], KL6outData22b [▶ 68]). The pointer is assigned with the *ADR*() function.
SizeComIn	INT	Size of the input process image of the serial hardware being used. The size is determined and assigned with the *SIZEOF*() function.

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer          : ComBuffer;
  RxBuffer          : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	Send data buffer that corresponds to the interface used. The buffer is filled by functions such as SendByte [▶ 40], SendData [▶ 41] or SendString [▶ 42].
RxBuffer	ComBuffer [▶ 64]	Receive data buffer corresponding to the interface in use. The buffer is read by functions such as ReceiveByte [▶ 33], ReceiveData [▶ 34] and ReceiveString [▶ 36].

Outputs

```
VAR_OUTPUT
  Error      : BOOL;
  ErrorID    : ComError_t;
END_VAR
```

Name	Type	Description
Error	BOOL	This output *Error* goes TRUE as soon as an error occurs.
ErrorID	ComError_t [▶ 70]	The *ErrorID* output provides an error code when an error occurs.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.3.2 SerialLineControlADS



The function block `SerialLineControlADS` handles the communication between a virtual serial interface and the PLC. The function block is called cyclically, and places received data into the `RxBuffer`. Data made available in the transmit buffer `TxBuffer` is sent to the interface at the same time.

Since the function is handled independent of the application, it is referred to as background communication. Just like the function block `SerialLineControl`, it can also be handled in a fast task. Normally, however, the function block can be called in the standard task and a separate second, faster task can be dispensed with. (see communication concept [▶ 31] and assisted hardware [▶ 29]).

When the function block is called cyclically and the input `Connect` is set, the parameterized serial COM port is opened automatically.
This means that this COM port is blocked for other applications. To enable the COM port for access from another application, you can reset the input *Connect*. The current port is then closed. If a different COM port or a different parameterization is selected in the input structure SerialCfg [▶ 65], the previous port is closed automatically and the new port is opened.

Inputs

```
VAR_INPUT
  Connect    : BOOL;   (* connect to serial port [TRUE=connect, FALSE=disconnect] *)
  SerialCfg  : ComSerialConfig;
  NetId      : T_AmsNetId := '';            (* host NetId *)
  Timeout    : TIME := DEFAULT_ADS_TIMEOUT; (* Timeout for ADS calls *)
END_VAR
```

Name	Type	Description
Connect	BOOL	To initialize a connection to a serial port, *Connect* TRUE must be applied to the function block. If *Connect* is FALSE, an opened port is closed again. INFO: If a change of this input variable is executed, it can take a maximum of 6 times the timespan specified at Timeout until the action has been completely executed. Therefore, the application must pay attention to the *PortOpened* output and wait until it assumes the desired state.
SerialCfg	ComSerialConfig [▶ 65]	This input structure defines which COM port is to be used and opened with which parameters.
NetId	T_AmsNetId	To execute the query on the local device, it is not necessary to specify this input variable. Alternatively, an empty string can be specified. To direct the request to another TwinCAT target device, the corresponding AMS Net Id can be specified here.
Timeout	TIME	Specifies a maximum duration of time for the execution of the function block. The default value is 5 seconds. (A value of at least 1000 ms should be specified)

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer          : ComBuffer;
  RxBuffer          : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	Buffer with send data for the serial interface being used. The transmit buffer is filled by functions such as SendByte [▶ 40], SendData [▶ 41] or SendString [▶ 42].
RxBuffer	ComBuffer [▶ 64]	Buffer into which received data is placed. The receive buffer is read by functions such as ReceiveByte [▶ 33], ReceiveData [▶ 34] or ReceiveString [▶ 36].

Outputs

```
VAR_OUTPUT
  PortOpened : BOOL;   (* Indicates if selected serial port is opened *)
  Error      : BOOL;   (* 'TRUE' if an error occurred *)
  ErrorID    : UDINT;  (* Displays the error code; 0 = no error *)
  Busy       : BOOL;   (* 'TRUE' if internal ADS communication is busy *)
  TxBufCount : UDINT;  (* number of bytes in internal Tx buffer *)
  RxBufCount : UDINT;  (* number of bytes in internal Rx buffer *)
END_VAR
```

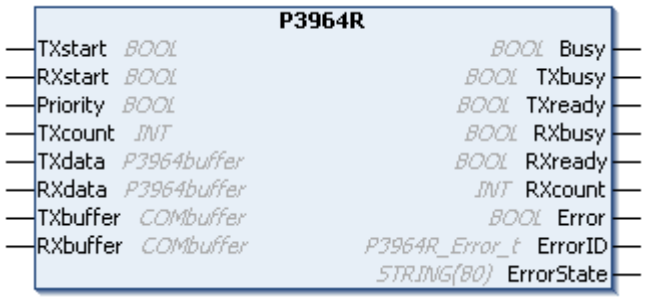
Name	Type	Description
PortOpened	BOOL	This output indicates whether the selected serial port is opened and linked.
Error	BOOL	This output *Error* goes TRUE as soon as an error occurs.
ErrorID	UDINT	The *ErrorID* output provides an error code when an error occurs. A list of possible values and notes on troubleshooting can be found in section Error codes [▶ 76].
Busy	BOOL	This output is TRUE as long as the internal ADS communication of the function block is active.
TxBufCount	UDINT	The output *TxBufCount* indicates whether the internal PLC buffer still contains data bytes that have not yet been sent.
RxBufCount	UDINT	The output *RxBufCount* can be used to determine whether there are still received data bytes in the internal PLC buffer that have not yet been transferred to the *RxBuffer*. The application must ensure that the received data is read out of the *RxBuffer* fast enough.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4016	PC or CX (x86, x64)	Tc2_SerialCom

5.1.4 3964R + RK512 protocols

5.1.4.1 3964R



The function block `P3964R` handles the 3964R protocol. The background communication, which is handled by a separate function block SerialLineControl [▶ 51] decides on the hardware interface used. The associated data buffers `TxBuffer` and `RxBuffer` (of type ComBuffer [▶ 64]) are transferred to the function block P3964R.

Sending

Send data are entered into the send data buffer `TXdata` by the PLC. The number of data bytes entered is passed on in `TXcount`, and then `TXstart` is set to TRUE. While sending, `TXbusy=TRUE`. Once the data has been successfully transferred, `TXready=TRUE`.

Receiving

`RXstart` is set to TRUE to receive data. After a complete data set has been received, the `RXready` output goes TRUE and `RXcount` data bytes are ready in the receive data buffer `RXdata`. While receiving, `RXbusy=TRUE`.

Interrupt reception

The function block `P3964R` can be used in either send or receive mode. It is worthwhile switching the function block to receive when transmission is not taking place. As long as the function block is in receive mode, but no start character has been received from the remote terminal, a rising edge at `TXstart` can interrupt the reception and initiate the sending of data. After the transfer the function block goes into its initial state (`Busy=FALSE`), and is only switched over to receive by a new edge at `RXstart`.

Priority

In a 3964R data connection, each remote terminal may send at any time. If both ends attempt to send at the same time, there is a collision. In that case, the end with the lower priority goes into receive mode, while the end with the higher priority sends again. For this reason, when priority is low the output `RXready=TRUE`, even though data are to be sent. The data in `RXdata` may then require evaluation. The setting of the priority at the two ends is to be agreed.

Inputs

```
VAR_INPUT
  TXstart  : BOOL;    (* start signal, edge-triggered *)
  RXstart  : BOOL;    (* start signal, edge-triggered *)
  Priority : BOOL;    (* 3964 priority, TRUE=high, FALSE=low *)
  TXcount  : INT;     (* number of data bytes in TxData *)
END_VAR
```

Name	Type	Description
TXstart	BOOL	`TXstart` is edge-triggered, so that before a new attempt to send is made, the function block must be called with `TXstart=FALSE`. If `TXstart` is then set to TRUE, this starts the transmission attempt.
RXstart	BOOL	`RXstart` is edge-triggered. `RXstart` is set to TRUE to receive data.
Priority	BOOL	In a 3964R data connection, each remote terminal may send at any time. If both ends attempt to send at the same time, there is a collision. In that case, the end with the lower priority goes into receive mode, while the end with the higher priority sends again. For this reason, when priority is low the output `RXready=TRUE`, even though data are to be sent. The data in `RXdata` may then require evaluation. The setting of the priority at the two ends is to be agreed.
TXcount	INT	The entered number of data bytes is transferred to `TXcount`.

Inputs/outputs

```
VAR_IN_OUT
  TXdata          : P3964buffer;  (* application data (to send)*)
  RXdata          : P3964buffer;  (* application data (received)*)
  TxBuffer        : ComBuffer;    (* buffer between protocol software and terminal *)
  RxBuffer        : ComBuffer;    (* buffer between protocol software and terminal *)
END_VAR
```

Name	Type	Description
TXdata	P3964buffer [▶ 70]	Send data are entered into the send data buffer `TXdata` by the PLC.
RXdata	P3964buffer [▶ 70]	`RXcount` data bytes are available in the receive data buffer `RXdata`.
TxBuffer	ComBuffer	Buffer with send data for the serial hardware being used.
RxBuffer	ComBuffer	Buffer into which received data is placed.

Outputs

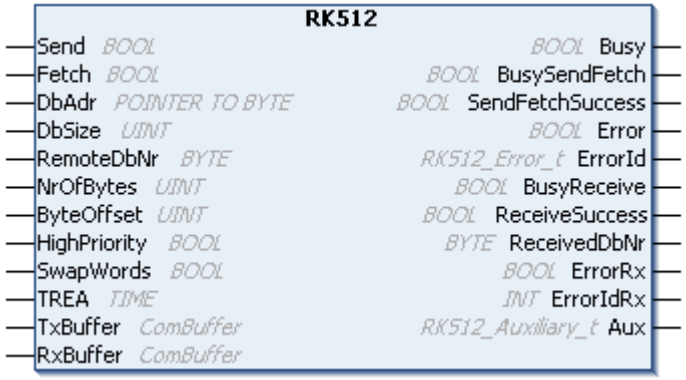
```
VAR_OUTPUT
  Busy       : BOOL;           (* block is active *)
  TXbusy     : BOOL;           (* send state *)
  TXready    : BOOL;           (* send completed, data were transferred *)
  RXbusy     : BOOL;           (* receive state *)
  RXready    : BOOL;           (* receive completed, data were transferred *)
  RXcount    : INT;            (* number of data bytes in RxData *)
  Error      : BOOL;           (* error *)
  ErrorID    : P3964R_Error_t; (* error id *)
  ErrorState : STRING(80);     (* internal error state *)
END_VAR
```

Name	Type	Description
Busy	BOOL	After the transfer, the function block switches to the basic state (`Busy=FALSE`).
TXbusy	BOOL	While sending, `TXbusy=TRUE`.
TXready	BOOL	Once the data has been successfully transferred, `TXready=TRUE`.
RXbusy	BOOL	While receiving, `RXbusy=TRUE`.
RXready	BOOL	After a complete data set has been received, the output is `RXready=TRUE`.
RXcount	INT	`RXcount` data bytes are available in the receive data buffer `RXdata`.
Error	BOOL	In the event of an error, the output is `Error=TRUE` and the function block goes into the initial state (`Busy=FALSE`).
ErrorID	P3964R_Error_t	The `ErrorID` returns the error code [▶ 81].
ErrorState	STRING	`ErrorState` provides information about the state in which the error occurred when the internal protocol structure is known.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.1.4.2 RK512



The function block RK512 basically distinguishes two operation modes, passive and active operation.

In the passive mode the function block waits for and answers data telegrams from the communication partner. The communication partner can send the data blocks to the local controller, or can fetch data from it. In order for the function block RK512 to be able to accept data blocks or to return data that has been requested, it must previously be configured for passive operation by DBconfig() [▶ 59].

In active mode, the RK512 function block either sends data blocks to the communication partner (SEND) or fetches them from it (FETCH).

As long as neither of the function block's *Send* or *Fetch* inputs switch it into active operation it waits for telegrams from communication partners, changing when appropriate into passive mode. The two operation modes can be mixed. In that case the RK512 function block attempts to synchronize the telegram traffic. Since mixed mode operation can introduce delays into the data traffic, it should be avoided if possible.

One instance of the RK512 function block serves just one serial interface. It is not possible for multiple instances to handle data traffic over the same serial interface at the same time.

Inputs

```
VAR_INPUT
  Send         : BOOL;  (* SEND command *)
  Fetch        : BOOL;  (* FETCH command *)
  DbAdr        : POINTER TO BYTE; (* ADR(DB), SEND=source, FETCH=target *)
  DbSize       : UINT;  (* SIZEOF(DB), size in byte for Send or Fetch *)
  RemoteDbNr   : BYTE;  (* SEND=target, FETCH=source *)
  NrOfBytes    : UINT;  (* number of bytes to send or fetch *)
  ByteOffset   : UINT;  (* byte offset in remote DB *)
  HighPriority : BOOL;  (* 3964R priority *)
  SwapWords    : BOOL;  (* swaps every two bytes in the data stream before/after transmission *)
  TREA         : TIME;  (* Timeout for answer *)

END_VAR
```

Name	Type	Description
Send	BOOL	With a positive edge at the *Send* input, data from the variable at the *DbAdr* input is sent to the communication partner where it is saved in the data block whose number is given at *RemoteDbNr*. Send and fetch cannot be executed at the same time.
Fetch	BOOL	With a positive edge at the *Fetch* input, data from the data block *RemoteDbNr* is requested from the communication partner and stored in the variable at input *DbAdr*. Send and fetch cannot be executed at the same time.
DbAdr	POINTER TO BYTE	*DbAdr* is the memory address of a PLC variable determined by the ADR function. e.g.: `DbAdr := ADR( PLCvar );` The PLC variable can be of any type. An ARRAY OF WORD, for example, or a STRUCT data structure would be suitable. Data from this variable is transmitted to the communication partner with a send command, and is fetched and stored in this variable with a fetch command.
DbSize	UINT	DbSize is the size of the PLC variable at *DbAdr* in bytes, determined by the SIZEOF() function. e.g.: `DbSize := SIZEOF( PLCvar );`
RemoteDbNr	BYTE	RemoteDbNr contains the number of the data block at the communication partner to which the data is to be sent or from which it is to be fetched.
NrOfBytes	UINT	NrOfBytes contains the number of data bytes to be transferred. The number can be less than or equal to the variable size *DbSize*.
ByteOffset	UINT	The *ByteOffset* indicated the data byte within the communication partner's data block from where the data is to be fetched or where it is to be stored.
HighPriority	BOOL	The priority is relevant to the 3964R protocol. The two communication partners should have different priorities. If it happens that the two partners transmit at the same time, there is a collision. This collision is resolved by the partner with the lower priority switching to receive mode, allowing the higher priority partner to transmit again.
SwapWords	BOOL	Data blocks are usually organized by words. Depending on how the data words are stored in the memory, it may be necessary to swap data bytes within the transmitted words. If *SwapWords* is TRUE, the data bytes of each word in all the data telegrams are swapped.
TREA	TIME	Each telegram from a communication partner is acknowledged with an answer telegram. The time required for this acknowledgement is monitored with respect to the *TREA* timeout period. *TREA* might be about 15 seconds.

Inputs/outputs

```
VAR_IN_OUT
  TxBuffer          : ComBuffer;
  RxBuffer          : ComBuffer;
END_VAR
```

Name	Type	Description
TxBuffer	ComBuffer [▶ 64]	The send data buffer `TxBuffer` is used by the function block RK512, and is not changed by the user.
RxBuffer	ComBuffer [▶ 64]	The receive data buffer `RxBuffer` is used by the function block RK512, and is not changed by the user.

Outputs

```
VAR_OUTPUT
  Busy             : BOOL;   (* FB is busy *)
   (* send or fetch (active) mode *)
  BusySendFetch    : BOOL;   (* FB is with SendFetchCommand busy *)
  SendFetchSuccess : BOOL;   (* Send or Fetch successfully finished *)
  Error            : BOOL;   (* RK512 error *)
  ErrorId          : RK512_Error_t;    (* RK512 error id *)
   (* receive (passive) mode only *)
  BusyReceive      : BOOL;   (* FB is busy with remote request *)
  ReceiveSuccess   : BOOL;   (* DB has been received from the remote PLC *)
  ReceivedDbNr     : BYTE;   (* Number of the DB that has been received *)
  ErrorRx          : BOOL;   (* RK512 error. For receive mode only *)
  ErrorIdRx        : RK512_Error_t;    (* RK512 error id. For receive mode only *)
  Aux              : RK512_Auxiliary_t;  (* Additional errors for debugging *)
END_VAR
```

Name	Type	Description
Busy	BOOL	Busy becomes TRUE as soon as the function block switches into either active or passive mode, i.e. as soon as it leaves the idle state. It cannot accept a new command as long as *Busy* remains TRUE.
BusySendFetch	BOOL	BusySendFetch becomes TRUE as soon as a positive edge at the *Send* or *Fetch* input switches the function block into active mode. Once *BusySendFetch* has become FALSE the transmission has been completed, and either the *SendFetchSuccess* or the *Error* output is set.
SendFetchSuccess	BOOL	SendFetchSuccess indicates that a data transmission triggered by Send or Fetch has been successfully completed.
Error	BOOL	Error becomes TRUE if an error occurs during a data transmission triggered by *Send* or *Fetch*.
ErrorId	RK512_Error_t	ErrorId provides an error number [▶ 82] if an error occurs.
BusyReceive	BOOL	BusyReceive indicates that the RK512 function block is in receive mode, i.e. in the passive operation mode. The function block changes automatically into passive mode from the idle state (*Busy* is FALSE) as soon as a telegram is received from the communication partner. With falling edge at *BusyReceive* either *ReceiveSuccess* or *ErrorRx* is set.
ReceiveSuccess	BOOL	*ReceiveSuccess* is set to TRUE after a data block has been successfully received from the communication partner. This signal is only relevant to passive operation. In other words, *ReceiveSuccess* is not set to TRUE if a data block has been actively fetched from the communication partner with *Fetch*.
ReceivedDbNr	BYTE	As soon as ReceiveSuccess becomes TRUE, *ReceivedDbNr* indicates the number of the data block that has been received.
ErrorRx	BOOL	The *ErrorRx* signal indicates that an error has occurred during data reception in passive mode.
ErrorIdRx	RK512_Error_t	If an error occurs in passive mode, ErrorIdRx indicates the error number [▶ 82].
Aux	RK512_Auxiliary_t	Aux is a data structure containing additional error messages for diagnostic purposes.

DBconfig()- Method for data block configuration

The RK512 function block has two operating modes. In passive mode it receives data and request telegrams from a communication partner who is addressing data blocks by means of its data block number. Numbered data blocks are not known to IEC-1131, and therefore initially also not to TwinCAT. In TwinCAT, data blocks are variables of various types such as arrays or data structures (STRUCT).

In order to define a numbered data block, the method DBconfig belonging to the RK512 function block as called with all the necessary parameters during the initialisation phase. The method is called once for each data block that is to be addressed by communication partners. This configuration is not needed for the active operating mode (send and fetch).

In the active operating mode variable contents can be sent to or fetched from communication partners, independently of this data block configuration. In active mode the data block number refers to the partner device, and only needs to be known there.

Parameter

Name	Description
DbAdr	*DbAdr* is the memory address of a PLC variable that is to be defined as a data block. The address is determined using the ADR function. e. g.: DbAdr := ADR(PLCvar); The PLC variable can be of any type. An ARRAY OF WORD, for example, or a STRUCT data structure would be suitable.
DbSize	DbSize is the size of the PLC variable at *DbAdr* in bytes, determined by the SIZEOF function. e. g. DbSize := SIZEOF(PLCvar);
RemoteDbNr	RemoteDbNr contains the number of the data block at the communication partner.
TxBuffer	The send data buffer *TxBuffer* is of type COMbuffer. This parameter is not needed by the configuration, but must however be passed as an IN_OUT parameter.
RxBuffer	The receive data buffer *RxBuffer* is of type COMbuffer. This parameter is not needed by the configuration, but must however be passed as an IN_OUT parameter.

Sample

```
VAR
  (* declare some DB
  (* the type of data doesn't matter but the
  (* size shouldn't be larger than 128 bytes *)
  DB1 : ARRAY[1..64] OF WORD; (* exemplary type of db *)
  DB5 : ARRAY[1..64] OF WORD; (* exemplary type of db *)
  DB10 : ARRAY[1..64] OF WORD; (* exemplary type of db *)

  (* input and output data for the RK512 function block *)
  RK512com : RK512;

  initialized : BOOL;
END_VAR


IF NOT initialized THEN
  RK512com.DBconfig( RemoteDbNr:=5, DbAdr:=ADR(DB5), DbSize:=SIZEOF(DB5), TxBuffer:=TxBuffer,
RxBuffer:=RxBuffer );
  RK512com.DBconfig( RemoteDbNr:=10, DbAdr:=ADR(DB10), DbSize:=SIZEOF(DB10), TxBuffer:=TxBuffer,
RxBuffer:=RxBuffer );
   initialized := TRUE;
END_IF
```

The initialization in this sample has the effect that the communication partner may read or write data blocks 5 and 10. Any attempt to access another data block is considered as an error and is refused.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.2 Functions

5.2.1 Help Functions

5.2.1.1 ASC



The function Asc returns the ASCII code of the first character of the input sting as one byte.

Interface

```
FUNCTION ASC : BYTE
VAR_INPUT
   str : STRING;
END_VAR
```

Background:

Send data is often available as a string of characters. If it is to be sent, the individual characters are required as bytes.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.2.1.2 CHR



The function Chr returns the character corresponding to the ASCII code in the input variable c to a string.

Interface

```
FUNCTION CHR : STRING
VAR_INPUT
   c : BYTE;
END_VAR
```

Background:

Received characters arrive as bytes at the PLC system, and must often be further processed in the form of strings.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.2.2 Conversion functions

5.2.2.1 ComError_TO_TcEventEntry



The ComError_TO_TcEventEntry function converts errors that can occur at various function blocks(SerialLineControl [▶ 51], SendData [▶ 41], ReceiveData [▶ 34], ...) into an event definition.

The event definition (of type TcEventEntry) can be used to create an event with the Tc3_EventLogger PLC library and send it if required. The event text can also be queried for this event. This allows an error code to be converted into a plain text description, which often exists in several languages.

Return value

Name	Type	Description
ComError_TO_TcEventEntry	BOOL	If the conversion is successful, the function returns TRUE.

Inputs

```
VAR_INPUT
  eErrorId      : ComError_t;
  stEventEntry  : REFERENCE TO TcEventEntry;
END_VAR
```

Name	Type	Description
eErrorId	ComError_t [▶ 70]	Error code to be converted.
stEventEntry	REFERENCE TO TcEventEntry	Event definition as a result of the conversion

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4024	PC or CX (x86, x64, Arm®)	Tc2_SerialCom v3.3.7.0

5.2.2.2 P3964RError_TO_TcEventEntry



The P3964RError_TO_TcEventEntry function converts errors that can occur at the P3964R [▶ 54] function block to an event definition.

The event definition (of type TcEventEntry) can be used to create an event with the Tc3_EventLogger PLC library and send it if required. The event text can also be queried for this event. This allows an error code to be converted into a plain text description, which often exists in several languages.

Return value

Name	Type	Description
P3964RError_TO_TcEventEntry	BOOL	If the conversion is successful, the function returns TRUE.

Inputs

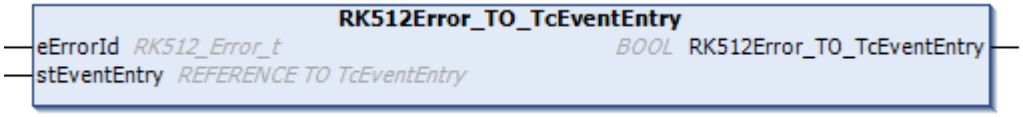
```
VAR_INPUT
  eErrorId      : P3964R_Error_t;
  stEventEntry  : REFERENCE TO TcEventEntry;
END_VAR
```

Name	Type	Description
eErrorId	P3964R_Error_t	Error code to be converted.
stEventEntry	REFERENCE TO TcEventEntry	Event definition as a result of the conversion

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4024	PC or CX (x86, x64, Arm®)	Tc2_SerialCom v3.3.10.0

5.2.2.3 RK512Error_TO_TcEventEntry



The RK512Error_TO_TcEventEntry function converts errors that can occur in the RK512 [▶ 57] function block to an event definition.

The event definition (of type TcEventEntry) can be used to create an event with the Tc3_EventLogger PLC library and send it if required. The event text can also be queried for this event. This allows an error code to be converted into a plain text description, which often exists in several languages.

Return value

Name	Type	Description
RK512Error_TO_TcEventEntry	BOOL	If the conversion is successful, the function returns TRUE.

Inputs

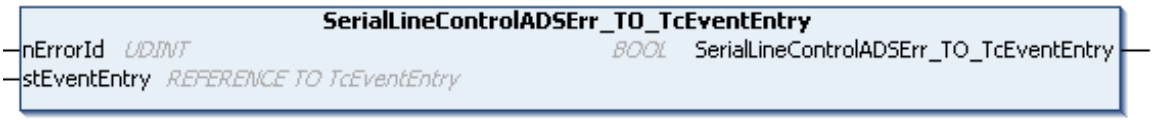
```
VAR_INPUT
  eErrorId      : RK512_Error_t;
  stEventEntry  : REFERENCE TO TcEventEntry;
END_VAR
```

Name	Type	Description
eErrorId	RK512_Error_t	Error code to be converted.
stEventEntry	REFERENCE TO TcEventEntry	Event definition as a result of the conversion

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4024	PC or CX (x86, x64, Arm®)	Tc2_SerialCom v3.3.10.0

5.2.2.4 SerialLineControlADSErr_TO_TcEventEntry



The SerialLineControlADSErr_TO_TcEventEntry function converts errors that can occur in the SerialLineControlADS [▶ 52] function block to an event definition.

The event definition (of type TcEventEntry) can be used to create an event with the Tc3_EventLogger PLC library and send it if required. The event text can also be queried for this event. This allows an error code to be converted into a plain text description, which often exists in several languages.

Return value

Name	Type	Description
SerialLineControlADSErr_TO_TcEventEntry	BOOL	If the conversion is successful, the function returns TRUE.

Inputs

```
VAR_INPUT
  nErrorId      : UDINT;
  stEventEntry  : REFERENCE TO TcEventEntry;
END_VAR
```

Name	Type	Description
nErrorId	UDINT	Error code to be converted.
stEventEntry	REFERENCE TO TcEventEntry	Event definition as a result of the conversion

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4024	PC or CX (x86, x64, Arm®)	Tc2_SerialCom v3.3.7.0

5.3 Data Types

5.3.1 Structures

5.3.1.1 ComBuffer

The data structure **ComBuffer** is a data buffer for decoupling the hardware-dependent communication blocks from the hardware-independent blocks (see also Communication concept [▶ 31]). At the same time this decouples a fast communication task from the standard task. Data buffers of type ComBuffer are never directly written or read by the user, but are merely used as intermediate storage for the communication blocks.

```
TYPE ComBuffer
STRUCT
    Buffer   : ARRAY[0..300] OF BYTE; (* ringbuffer *)
    RdIdx    : INT;      (* first valid byte in ringbuffer *)
    WrIdx    : INT;      (* first invalid byte in ringbuffer *)
    Count    : INT;      (* number of bytes in ringbuffer *)
    FreeByte : INT;      (* number of free bytes in ringbuffer *)
    Error    : INT;      (* error code of serial line interface *)
    blocked  : BOOL;     (* semaphore for task synchronization *)
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.2 ComRegisterList_t, ComRegisterData_t

Data structures of the register list

Data type *ComRegisterList_t* has been defined for reading and writing of registers of a serial Bus Terminal. Each entry of the *register list* contains the register number and the register content.

ComRegisterList_t

```
TYPE ComRegisterList_t : ARRAY[0..63] OF ComRegisterData_t;
END_TYPE
```

ComRegisterData_t

```
TYPE ComRegisterData_t :
STRUCT
Register : BYTE;
Value : WORD;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.3 ComSerialConfig

This input structure defines which COM port is to be used and opened with which parameters.

If a parameter is changed during cyclic calls of SerialLineControlADS [▶ 52], the existing COM port connection is closed automatically, and the serial COM port is opened with the new parameter. It is not necessary to close the port explicitly by resetting the input *Connect*.

```
(* contains the configuration parameters of the com port to be opened. *)
TYPE ComSerialConfig :
STRUCT
    ComPort  : UDINT :=1;          (* Serial port number [1..255] *)
    Baudrate : UDINT :=9600;
    Parity   : ComParity_t :=PARITY_NONE;
    DataBits : INT :=8;            (* [4..8] *)
    StopBits : ComStopBits_t :=STOPBITS_ONE;

    DTR      : ComDTRCtrl_t :=DTR_CTRL_HANDSHAKE; (* 'Data Terminal Ready' signal *)
    RTS      : ComRTSCtrl_t :=RTS_CTRL_HANDSHAKE; (* 'Request to Send' signal (= RFR 'Ready for Rece
iving') *)
    CTS      : BOOL :=FALSE;       (* 'Clear to Send' signal *)
    DSR      : BOOL :=FALSE;       (* 'Dataset Ready' signal *)

    TraceLevel : BYTE     :=0;     (* None=0;Error=1,Warning=2,Info=3,Verbose=4,Noise=5 *)

    Reserved1  : BYTE;
    Reserved2  : BYTE;
    Reserved3  : BYTE;
END_STRUCT
END_TYPE
```

Name	Description
ComPort	Windows operating system: Any COM port (COM1, ..., COM255) can be selected. The Windows hardware device manager indicates which number a driver (e.g. a USB-to-virtual-COM-port driver) has assigned. TwinCAT/BSD® operating system: Serial ports with the device names 'ttyU0' (or 'ttyu0') to 'ttyU255' (or 'ttyu255') can be selected. The number assigned to a driver (e.g. a USB-To-Virtual-Com-Port driver) can be found in the /dev/ folder. A device name 'ttyU2' (USB device) is preferred over 'ttyu2' (serial HW port). TwinCAT RT Linux® operating system: Serial ports with the device names `ttyUSB0` to `ttyUSB255` or `ttyACM0` to `ttyACM255` as well as `ttyS0` to `ttyS255` can be selected. The number assigned to a driver (e.g. a USB-To-Virtual-Com-Port driver) can be found in the /dev/ folder. A device name ‘ttyUSB2’ (USB device) is preferred over ‘ttyS2’ (serial HW port).
Baud rate	All standard baud rates can be set, from 150 baud up to 128000 baud. The default is 9600 baud. 115200 baud is also a common transfer rate.
Parity	The parity check for the serial data transmission is set here. Possible values are summarized in the enumeration ComParity_t [▶ 70].
DataBits	The number of data bits for the serial data transmission is set here. Possible values are 4, 5, 6, 7 and 8. Even if the value is less than 8 bits, complete data bytes are transferred to the PLC buffer. However, not all 8 bits of a byte are transferred via the serial interface. The most significant bits are truncated before transmission, which reduces the amount of bits per byte of data to be transmitted. This setting was mainly useful in earlier times if you knew that the most significant bits in each byte would never be used and you wanted to increase the data transfer rate. Nowadays it is rarely used, so that it is recommended to leave the number of data bits at 8 [default].
StopBits	The number of stop bits for the serial data transmission is set here. Possible values are summarized in the enumeration ComStopBits_t [▶ 72].
RTS	The 'Request to Send' signal (= RFR 'Ready for Receiving') for the serial data transmission is set here. Possible values are summarized in the enumeration ComRTSCtrl_t [▶ 71].
DTR	The 'Data Terminal Ready' signal for the serial data transmission is set here. Possible values are summarized in the enumeration ComDTRCtrl_t [▶ 70].
CTS	The 'Clear to Send' signal for the serial data transmission is set here. If the value is TRUE, no data are sent if the CTS input signal for the data transmission is not set.
DSR	The 'Dataset Ready' signal for the serial data transmission is set here. If the value is TRUE, no data are sent if the DSR input signal for the data transmission is not set. If *DSR* is TRUE, received data bytes are ignored, if the DSR input signal for the data transmission is not set.

Name	Description
TraceLevel	This input can be used to configure the output of messages (debug traces) by the TcAdsSerialCommServer. This does not affect the error messages at the output of the PLC function block SerialLineControlADS. This is therefore an additional diagnostic option. The following trace levels are possible: None: 0 (default) Error: 1 Warning: 2 Info: 3 Verbose: 4 Noise: 5 All messages with a level less than or equal to the specified level are output. If level 'None' is selected, no messages are output. With level 'Noise', even data received at the serial port and data sent to the serial port are output in the messages. This option requires considerable system resources and should therefore only be selected for temporary testing purposes. Debug traces are used as output. Under Big Windows operating systems, error/warning/information messages are also output as log events (application log). Note: If the DebugView Windows tool (from SysInternals) is used, the setting CaptureGlobalWin32 must be active in order to receive the messages. Under TwinCAT/BSD operating systems the messages are stored in /var/log/messages. Under TwinCAT RT Linux® operating systems, the messages are made available via the "journalctl" command.

Invalid parameterization

Not all parameter settings for serial data transmission may be available in all cases. Some settings or combinations are not supported by the operating system (Windows, TwinCAT/BSD) or by COM port drivers or the hardware.

Example: In some cases the 1.5 stop bits or the 4 data bits options, or the combination of 5 data bits & 2 stop bits are not supported. Or the baud rate may be limited to a maximum of 115200 baud. Please also check the interface description of the respective embedded PC / IPC (e.g. Interface description of the CX52x0).

Further information on the parameters of a serial data transmission under Windows can be found in the Microsoft MSDN description of the DCB structure.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4016	PC or CX (x86, x64)	Tc2_SerialCom

5.3.1.4 KL6inData, KL6outData

Data structures for the KL6xxx serial bus terminal in 3-byte mode

For data exchange by way of the I/O bus, every serial bus terminal needs variables of type KL6inData and KL6outData. These variables are placed at a fixed address in the memory map, and are linked to the hardware with the TwinCAT System Manager.

KL6inData

```
TYPE KL6inData
STRUCT
Status: BYTE;
SerStatus: BYTE;
D: ARRAY[0..2] OF BYTE;
END_STRUCT
END_TYPE
```

KL6outData

```
TYPE KL6outData
STRUCT
Ctrl: BYTE;
SerCtrl: BYTE;
D: ARRAY[0..2] OF BYTE;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.5 KL6inData5B, KL6outData5B

Data structures for the KL6xxx serial bus terminal in 5-byte mode

For data exchange by way of the I/O bus, every serial bus terminal needs variables of type KL6inData5B and KL6outData5B. These variables are placed at a fixed address in the memory map, and are linked to the hardware with the TwinCAT System Manager.

KL6inData5B

```
TYPE KL6inData5B
STRUCT
Status: BYTE;
D: ARRAY[0..4] OF BYTE;
END_STRUCT
END_TYPE
```

KL6outData5B

```
TYPE KL6outData5B
STRUCT
Ctrl: BYTE;
D: ARRAY[0..4] OF BYTE;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.6 KL6inData22B, KL6outData22B

Data structures for the KL6xxx serial bus terminal in 22-byte mode

For data exchange by way of the I/O bus, every serial bus terminal needs variables of type KL6inData22B and KL6outData22B. These variables are placed at a fixed address in the memory map, and are linked to the hardware with the TwinCAT System Manager.

KL6inData22B

```
TYPE KL6inData22B
STRUCT
Status : WORD;
```

```
D : ARRAY[0..21] OF BYTE;
END_STRUCT
END_TYPE
```

KL6outData22B

```
TYPE KL6outData22B
STRUCT
Ctrl : WORD;
D : ARRAY[0..21] OF BYTE;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.7 EL6inData22B, EL6outData22B

Data structures for serial EtherCAT Terminal EL60xx in 22-byte mode

For data exchange via the I/O bus each serial EtherCAT Terminal requires a variable of type EL6inData22B and a variable of type EL6outData22B. These variables are placed at a fixed address in the memory map, and are linked to the hardware with the TwinCAT System Manager.

EL6inData22B

```
TYPE EL6inData22B
STRUCT
Status : WORD;
D : ARRAY[0..21] OF BYTE;
END_STRUCT
END_TYPE
```

EL6outData22B

```
TYPE EL6outData22B
STRUCT
Ctrl : WORD;
D : ARRAY[0..21] OF BYTE;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.8 PcComInData, PcComOutData

Data structures for the COM serial PC interfaces

Every serial PC interface needs a variable of type PcComInData and one of type PcComOutData for data exchange. These variables are placed at a fixed address in the memory map, and are linked to the hardware with the TwinCAT System Manager.

PcComInData

```
TYPE PcComInData
STRUCT
SerStatus: WORD;
D: ARRAY[0..63] OF BYTE;
END_STRUCT
END_TYPE
```

PcComOutData

```
TYPE PcComOutData
STRUCT
SerCtrl: WORD;
D: ARRAY[0..63] OF BYTE;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.1.9 P3694buffer

Data buffers of type P3964buffer are used in association with the function block P3964R [▶ 54]. These buffers are written and read by the user.

```
TYPE P3964buffer
STRUCT
D : ARRAY [0..16#0FFF] OF BYTE;
END_STRUCT
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2 Enumerations

5.3.2.1 ComDTRCtrl_t

```
TYPE ComDTRCtrl_t :
(
DTR_CTRL_DISABLE,
DTR_CTRL_ENABLE,
DTR_CTRL_HANDSHAKE
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2.2 ComError_t

Error codes of type ComError_t are listed below.
A complete list of all possible error codes [▶ 75] can be found in the appendix.

ComError_t

```
TYPE ComError_t :
(
COMERROR_NOERROR                := 0,
COMERROR_PARAMETERCHANGED       := 1, (* input parameters changed during reception *)
COMERROR_TXBUFFOVERRUN          := 2, (* string > transmit buffer *)
COMERROR_STRINGOVERRUN          := 10, (* end of string *)
COMERROR_ZEROCHARINVALID        := 11, (* string cannot receive zero characters *)
COMERROR_INVALIDPOINTER         := 20, (* invalid data pointer, e. g. zero *)
COMERROR_INVALIDRXPOINTER       := 21, (* invalid data pointer for ReceiveData *)
COMERROR_INVALIDRXLENGTH        := 22, (* invalid length for ReceiveData, e. g. zero *)
COMERROR_DATASIZEOVERRUN        := 23, (* end of data block *)
COMERROR_INVALIDPROCESSDATASIZE := 24,
COMERROR_MODENOTSUPPORTED       := 16#0101, (* mode not supported (3-Byte Terminals connected to bus
```

```
controllers) *)
COMERROR_INVALIDCHANNELNUMBER   := 16#0102,
COMERROR_INVALIDBAUDRATE        := 16#1001,
COMERROR_INVALIDNUMDATABITS     := 16#1002,
COMERROR_INVALIDNUMSTOPBITS     := 16#1003,
COMERROR_INVALIDPARITY          := 16#1004,
COMERROR_INVALIDHANDSHAKE       := 16#1005,
COMERROR_INVALIDNUMREGISTERS    := 16#1006,
COMERROR_INVALIDREGISTER        := 16#1007,
COMERROR_TIMEOUT                := 16#1008
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2.3 ComHandshake_t

```
TYPE ComHandshake_t :
(
HANDSHAKE_NONE,
HANDSHAKE_RTSCTS,
HANDSHAKE_XONXOFF,
RS485_FULLDUPLEX,
RS485_HALFDUPLEX,
RS485_FULLDUPLEX_XONXOFF,
RS485_HALFDUPLEX_XONXOFF
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2.4 ComParity_t

```
TYPE ComParity_t :
(
PARITY_NONE,
PARITY_EVEN,
PARITY_ODD,
PARITY_MARK, (* only available with SerialLineControlADS *)
PARITY_SPACE (* only available with SerialLineControlADS *)
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2.5 ComRTSCtrl_t

```
TYPE ComRTSCtrl_t :
(
RTS_CTRL_DISABLE,
RTS_CTRL_ENABLE,
RTS_CTRL_HANDSHAKE,
RTS_CTRL_TOGGLE
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2.6 ComSerialLineMode_t

The enumeration type ComSerialLineMode_t fixes the type of serial hardware used for various hardware-dependent function blocks of the serial communication library.

```
TYPE ComSerialLineMode_t :
(
SERIALLINEMODE_DEFAULT,
SERIALLINEMODE_KL6_3B_ALTERNATIVE,
SERIALLINEMODE_KL6_5B_STANDARD,
SERIALLINEMODE_KL6_22B_STANDARD,
SERIALLINEMODE_PC_COM_PORT,
SERIALLINEMODE_EL6_22B,
SERIALLINEMODE_IE6_11B
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.3.2.7 ComStopBits_t

```
TYPE ComStopBits_t :
(
STOPBITS_ONE := 1,
STOPBITS_TWO := 2,
STOPBITS_ONE5 := 3
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

5.4 Global constants

5.4.1 Library version

All libraries have a certain version. This version is displayed in the repository of the PLC library.
The version number of the library is stored in a global constant.

Global_Version

```
VAR_GLOBAL CONSTANT
    stLibVersion_Tc2_SerialCom : ST_LibVersion;
END_VAR
```

Name	Type	Description
stLibVersion_Tc2_SerialCom	ST_LibVersion	Version number of the Tc2_SerialCom library

The F_CmpLibVersion function (in the Tc2_System library) is used to compare the existing and required version.

Compatibility with TwinCAT 2

Query options for TwinCAT 2 libraries are no longer available.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

6 Examples

The following examples were developed with different hardware.

Example 1 - Tutorial

The application of the library blocks is explained in the form of a Tutorial [▶ 18], including the sections 'Integration in a PLC program' and 'Configuration in the TwinCAT System Manager'. Reference is also made to the use of different hardware.

Project https://infosys.beckhoff.com/content/1033/TF6340_Tc3_Serial_Communication/Resources/392132619.zip

Example 2 - Application of virtual Com ports

This example can be used for different applications with virtual Com ports.
Any data can be sent or received.

This is not really an example but a test program for testing the communication connection to the USB device. Nevertheless, as a first step it is advisable to use a Windows terminal program to test the functionality of the VirtualComPort driver of your device.

In an application that uses a virtual Com port only the call of SerialLineControlADS [▶ 52] is specific. The other serial communication calls, such as send and receive data, are identical to actual serial ports.

Linking in the TwinCAT System Manager is not required.
The example can be used for convenient commissioning and testing of the device. The example features a visualization.

Project https://infosys.beckhoff.com/content/1033/TF6340_Tc3_Serial_Communication/Resources/1494421387.zip

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4016	PC or CX (x86, x64)	Tc2_SerialCom

7 Appendix

7.1 Error codes overview

Not all function blocks of the TwinCAT PLC library Tc2_SerialCom return the same error codes. Three function blocks have their own error lists.

Most function blocks indicate a possible error via a ComError_t [▶ 75] return value.

The following three function blocks are exceptions:

- **SerialLineControlADS** : The function block only returns possible error values from its specific error list [▶ 76].
- **P3964R** : The function block only returns possible error values from its specific error list [▶ 81].
- **RK512** : The function block only returns possible error values from its specific error list [▶ 82].

7.2 Error Codes ComError_t

ComError_t

```
TYPE ComError_t :
(
COMERROR_NOERROR                := 0,
COMERROR_PARAMETERCHANGED       := 1, (* input parameters changed during reception *)
COMERROR_TXBUFFOVERRUN          := 2, (* string > transmit buffer *)
COMERROR_STRINGOVERRUN          := 10, (* end of string *)
COMERROR_ZEROCHARINVALID        := 11, (* string cannot receive zero characters *)
COMERROR_INVALIDPOINTER         := 20, (* invalid data pointer, e. g. zero *)
COMERROR_INVALIDRXPOINTER       := 21, (* invalid data pointer for ReceiveData *)
COMERROR_INVALIDRXLENGTH        := 22, (* invalid length for ReceiveData, e. g. zero *)
COMERROR_DATASIZEOVERRUN        := 23, (* end of data block *)
COMERROR_INVALIDPROCESSDATASIZE := 24,
COMERROR_MODENOTSUPPORTED       := 16#0101, (* mode not supported (3-Byte Terminals connected to bus
controllers) *)
COMERROR_INVALIDCHANNELNUMBER   := 16#0102,
COMERROR_INVALIDBAUDRATE        := 16#1001,
COMERROR_INVALIDNUMDATABITS     := 16#1002,
COMERROR_INVALIDNUMSTOPBITS     := 16#1003,
COMERROR_INVALIDPARITY          := 16#1004,
COMERROR_INVALIDHANDSHAKE       := 16#1005,
COMERROR_INVALIDNUMREGISTERS    := 16#1006,
COMERROR_INVALIDREGISTER        := 16#1007,
COMERROR_TIMEOUT                := 16#1008
);
END_TYPE
```

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

7.3 Error Codes SerialLineControlADS

Overview

Offset + error code	Range	Description
0x00000000 + TwinCAT System Error [▶ 84]	0x00000000-0x00007800	TwinCAT system error (including ADS error codes)
0x00000000 + TcAdsSerialCommServer error	0x00009000-0x000091FF	Error in the TwinCAT ADS Serial Comm Server
0x3D090000 + Win32 System Error Code [▶ 88]	0x3D090000-0x3D09FFFF	Win32 system error
0x7A120000 + FreeBSD®/Linux® system error	0x7A120000-0x7A12FFFF	FreeBSD®/Linux® system error

Error codes of the type *ComError_t* are not used by this function block.

Debugging

For more detailed error analysis additional debug outputs can be configured in the TcAdsSerialCommServer. Use the variable *TraceLevel* in the input structure SerialCfg [▶ 65] for this purpose.

Additional information on the most important TwinCAT system errors

Code (hex)	Code (dec)	Description	Additional information
0x00000006	6	The system cannot find the destination port. ADS Server may not have started.	The TwinCAT function, including ADS server, must be installed on the system on which the virtual COM port is located.

TcAdsSerialCommServer error

Code (hex)	Code (dec)	Description	Symbolic name
0x00009001	36865	The specified COM port is invalid. Valid value range: 1 .. 255	COMERRORADS_INVALID_COMPORT
0x00009002	36866	The command for the TcAdsSerialCommServer is invalid.	COMERRORADS_INVALID_CMD
0x00009003	36867	Internal error	COMERRORADS_INVALID_DATAPOINTER
0x00009011	36881	The parameter structure passed is unknown to the TcAdsSerialCommServer.	COMERRORADS_INVALID_CFGSTLEN
0x00009012	36882	The parameter structure passed is unknown to the TcAdsSerialCommServer.	COMERRORADS_INVALID_CFGSTVER
0x00009013	36883	The trace level (variable *TraceLevel* in the input structure SerialCfg [▶ 65]) for the output of messages is invalid.	COMERRORADS_INVALID_TL
0x00009021	36897	The specified baud rate is not supported.	COMERRORADS_INVALID_BAUDRATE
0x00009022	36898	The specified parity is invalid.	COMERRORADS_INVALID_PARITY
0x00009023	36899	The specified number of data bits is invalid.	COMERRORADS_INVALID_BYTESIZE
0x00009024	36900	The specified number of stop bits is invalid.	COMERRORADS_INVALID_STOPBIT
0x00009025	36901	Dtr control is invalid.	COMERRORADS_INVALID_DTR_CTRL
0x00009026	36902	Rts control is invalid.	COMERRORADS_INVALID_RTS_CTRL
0x00009027	36903	Cts is invalid	COMERRORADS_INVALID_CTS_OUTCTRL
0x00009028	36904	Dsr is invalid	COMERRORADS_INVALID_DSR_OUTCTRL
0x00009029	36905	Dsr is invalid	COMERRORADS_INVALID_DSR_SENS
0x00009031	36913	Internal error	COMERRORADS_NOT_INIT
0x00009032	36914	The receive buffer in the TcAdsSerialCommServer has overflowed. Incoming data is lost. Received data must be queried immediately. It must be ensured that no data accumulates in the PLC function block SerialLineControlADS [▶ 52]. This can be monitored with the output *RxBufCount*. With a stable communication connection, this value does not rise above 1000.	COMERRORADS_RD_BUFFER_OVERRUN
0x00009033	36915	The COM port is already open. *SerialLineControlADS* will automatically try to close the port and reopen it with the specified parameters. If no errors are present at the output in the following cycles and the output *PortOpened* = TRUE, an opening of the COM port has been successfully completed.	COMERRORADS_PORT_CONNECTED

Code (hex)	Code (dec)	Description	Symbolic name
0x00009034	36916	Interaction with the COM port is not possible because the COM port has not yet been opened by the TcAdsSerialCommServer. *SerialLineControlADS* will automatically try to reopen the port with the specified parameters. If no errors are present at the output in the following cycles and the output *PortOpened* = TRUE, an opening of the COM port has been successfully completed.	COMERRORADS_PORT_NOT_CONNECTED
0x00009035	36917	The COM port could not be closed correctly.	COMERRORADS_RD_THREAD_TIMEOUT
0x00009036	36918	The COM port could not be closed correctly.	COMERRORADS_WR_THREAD_TIMEOUT
0x00009037	36919	During an existing communication connection, this error may occur if the USB device is disconnected. Before disconnecting the USB device the input *bConnect* must be set to FALSE and thus the COM port is closed. Also a read error can be the trigger. Details can be output using the *TraceLevel* variable in the SerialCfg [▶ 65] input structure. *SerialLineControlADS* has closed the port and will automatically try to reopen it with the specified parameters. If no errors are present at the output in the following cycles and the output *PortOpened* = TRUE, an opening of the COM port has been successfully completed.	COMERRORADS_RD_FAILURE
0x00009038	36920	A write error can be the trigger for this error code. Details can be output with the help of the variable *TraceLevel* in the input structure SerialCfg [▶ 65]. It is possible that data has not been transferred. There is no automatic repetition of the write attempt.	COMERRORADS_WR_FAILURE
0x000090E0 - 0x000090FF	37088 - 37119	Internal errors	
0x00009101	37121	The version of the TcAdsSerialCommServer is incompatible. An official product installation fixes the error.	COMERRORADS_SERVER_INCOMPATIBLE

Additional information on the most important Win32 system errors

Code (hex)	Code (dec)	Description	Additional information	Symbolic name
0x3D090002	1024000002	The system cannot find the specified file.	This error can occur if the specified COM port is not available. Make sure the value for the COM port and the other parameters in ComSerialConfig [▶ 65] are specified correctly.	ERROR_FILE_NOT_FOUND
0x3D090005	1024000005	Access is denied.	Check whether the respective serial COM port was already occupied/opened by another program. In this case you have to enable the port from the other program, in order to enable communication.	ERROR_ACCESS_DENIED
0x3D090057	1024000087	The parameter is incorrect.	This error occurs if an input parameter for serial data transmission is invalid (see ComSerialConfig [▶ 65]). Not all parameter settings for serial data transmission may be available in all cases. Some settings or combinations are not supported by Windows or the COM port drivers. In this case you should check whether the communication works with a different parameter setting.	ERROR_INVALID_PARAMETER

Additional information on the most important FreeBSD® system errors and Beckhoff RT Linux® system errors

Code (hex)	Code (dec)	Description	Additional information
0x7A120002	2048000002	The system cannot find the specified file.	This error can occur if the specified COM port is not available. Make sure the value for the COM port and the other parameters in ComSerialConfig [▶ 65] are specified correctly.
0x7A120005	2048000005	An input/output error has occurred.	This error can occur if the specified COM port is already in use by another app. Because the specified COM port number is attempted to be opened both as a virtual COM port and as a hardware COM port, the error code may refer to the latter attempt. Details can be output using the *TraceLevel* variable in the SerialCfg [▶ 65] input structure.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4016	PC or CX (x86, x64)	Tc2_SerialCom

7.4 Error Codes 3964R

Code (dec)	Code (hex)	Error constant	Description
4	16#04	P3964ERR_ZVZ	The character delay time was exceeded. ZVZ = 220 ms. The character delay time is the maximum time interval between the transmission of two succeeding characters.
5	16#05	P3964ERR_QVZ	The acknowledgement delay time was exceeded. The other device sent an acknowledgement character (DLE = 10H) twice as the telegram was being handled. QVZ = 2 sec. The first acknowledgement is expected at the start of the transfer. The output *ErrorState* is "Wait_DLE_TXstart" in case of an error. The cause might lie with a faulty physical connection or an incorrect interface parameter. The second acknowledgement is expected after the user data has been transmitted. If an error occurs, the *ErrorState* is "Wait_DLE_TXend". In this case the cause might, for instance, be data loss, data corruption or data bytes of a data word that have become swapped (see the *SwapWords* input).
6	16#06	P3964ERR_WVZ	The repeat delay time was exceeded. WVZ = 4 sec. In the event of an error a telegram is repeated. If the telegram is not repeated by the other device, the 3964R function block reports this error.
7	16#07	P3964ERR_WRONGBCC	Checksum error during data reception. Each telegram is provided with a checksum. When the data is received, the calculated checksum is compared with the checksum that has been received.
9	16#09	P3964ERR_COMERRTX	Interface error when transmitting
10	16#0A	P3964ERR_COMERRRX	Interface error when receiving
11	16#0B	P3964ERR_NOTXDATA	Parameterization error. The number of bytes that are to be sent, *TxCount*, is zero.
20	16#14	P3964ERR_NAK	A telegram was refused by the other device with a negative acknowledgement (NAK). The error may occur in the following transmission states (*ErrorState*):*Wait_DLE_TXstart*: The local PLC initiates a telegram with a start character. The other device refuses the telegram with NAK.*Wait_DLE_TXend*: The other device refuses the telegram with NAK after the user data has been transmitted. In this case the cause can, for example, be a checksum error at the other device.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

7.5 Error Codes RK512

Code (dec)	Code (hex)	Error constant	Description
4	16#04	RK512ERR_P3964ERR_ZVZ	The character delay time was exceeded. ZVZ = 220 ms. The character delay time is the maximum time interval between the transmission of two succeeding characters.
5	16#05	RK512ERR_P3964ERR_QVZ	The acknowledgement delay time was exceeded. The other device sent an acknowledgement character (DLE = 10H) twice as the telegram was being handled. QVZ = 2 sec. The first acknowledgement is expected at the start of the transfer. The output *ErrorState* is "Wait_DLE_TXstart" in case of an error. The cause might lie with a faulty physical connection or an incorrect interface parameter. The second acknowledgement is expected after the user data has been transmitted. If an error occurs, the *ErrorState* is "Wait_DLE_TXend". In this case the cause might, for instance, be data loss, data corruption or data bytes of a data word that have become swapped (see the *SwapWords* input).
6	16#06	RK512ERR_P3964ERR_WVZ	The repeat delay time was exceeded. WVZ = 4 sec. In the event of an error a telegram is repeated. If the telegram is not repeated by the other device, the 3964R function block reports this error.
7	16#07	RK512ERR_P3964ERR_WRONGBCC	Checksum error during data reception. Each telegram is provided with a checksum. When the data is received, the calculated checksum is compared with the checksum that has been received.
9	16#09	RK512ERR_P3964ERR_COMERRTX	Interface error when transmitting
10	16#0A	RK512ERR_P3964ERR_COMERRRX	Interface error when receiving
11	16#0B	RK512ERR_P3964ERR_NOTXDATA	Parameterization error. The number of bytes that are to be sent, *TxCount*, is zero.
120	16#78	RK512ERR_P3964ERR_NAK	A telegram was refused by the other device with a negative acknowledgement (NAK). The error may occur in the following transmission states (*ErrorState*):*Wait_DLE_TXstart*: The local PLC initiates a telegram with a start character. The other device refuses the telegram with NAK.*Wait_DLE_TXend*: The other device refuses the telegram with NAK after the user data has been transmitted. In this case the cause can, for example, be a checksum error at the other device.
12	16#0C	RK512ERR_INVALIDDATATYPE	Invalid data type A telegram with unsupported data type ID was received. Only data blocks with the identifier 'D' can be handled.
16	16#10	RK512ERR_ERRORPROTOCOLHEADER	Wrong protocol header The header of a data telegram does not match the RK512 specification
20	16#14	RK512ERR_DBNOTAVAILIBLE	Data block not available. A data block that is not available has been transmitted or requested. Data blocks that are accessed by the partner device must first be registered for this purpose with the DBconfig method.

Code (dec)	Code (hex)	Error constant	Description
22	16#16	RK512ERR_INVALIDCOMMAND	Invalid command A telegram with invalid command ID (SEND / FETCH) was received.
52	16#34	RK512ERR_INVALIDSIZE	Either the *DbSize* or the *NrOfBytes* parameter is invalid, or a data telegram that is too long has been received.
53	16#35	RK512ERR_INVALIDDBADR	Invalid data block address The data block address *DbAdr* is invalid.
54	16#36	RK512ERR_SYNCERROR	Synchronization error A can occur if both communication partners start to transmit at the same time.
257	16#101	RK512ERR_TIMEOUT	Timeout at RK512 telegram level An expected response telegram was not received within the waiting time *TREA*.
258	16#102	RK512ERR_ERRORREMOTEREATEL	Error in the response telegram The response telegram from the communication partner contains an error message. The error number can be read from the additional error information in *AUX*.
259	16#103	RK512ERR_INVALIDSIZEREMOTEREATEL	The communication partner's reaction telegram has an incorrect length
260	16#104	RK512ERR_TIMEOUTREAPEATSENDFETCH	Timeout during sending A Send or Fetch telegram could not be sent, despite several attempts
261	16#105	RK512ERR_3964ERROR	Error on the 3964R protocol level. Predictable errors on this level are not reported as a general RK512ERR_3964ERROR error, but with a detailed error number.
262	16#106	RK512ERR_3964NOTBUSYNOTREADY	The transmission of a telegram has been halted without having been successfully completed.

Requirements

Development environment	Target platform	PLC libraries to include
TwinCAT v3.1.4012	PC or CX (x86, x64, Arm®)	Tc2_SerialCom

7.6 ADS Return Codes

Grouping of error codes:
Global error codes: 0x0000 [▶ 84]... (0x9811_0000 ...)
Router error codes: 0x500 [▶ 85]... (0x9811_0500 ...)
General ADS errors: 0x700 [▶ 85]... (0x9811_0700 ...)
RTime error codes: 0x1000 [▶ 87]... (0x9811_1000 ...)

Global error codes

Hex	Dec	HRESULT	Name	Description
0x0	0	0x98110000	ERR_NOERROR	No error.
0x1	1	0x98110001	ERR_INTERNAL	Internal error.
0x2	2	0x98110002	ERR_NORTIME	No real time.
0x3	3	0x98110003	ERR_ALLOCLOCKEDMEM	Allocation locked – memory error.
0x4	4	0x98110004	ERR_INSERTMAILBOX	Mailbox full – the ADS message could not be sent. Reducing the number of ADS messages per cycle will help.
0x5	5	0x98110005	ERR_WRONGRECEIVEHMSG	Wrong HMSG.
0x6	6	0x98110006	ERR_TARGETPORTNOTFOUND	Target port not found – ADS server is not started, not reachable or not installed.
0x7	7	0x98110007	ERR_TARGETMACHINENOTFOUND	Target computer not found – AMS route was not found.
0x8	8	0x98110008	ERR_UNKNOWNCMDID	Unknown command ID.
0x9	9	0x98110009	ERR_BADTASKID	Invalid task ID.
0xA	10	0x9811000A	ERR_NOIO	No IO.
0xB	11	0x9811000B	ERR_UNKNOWNAMSCMD	Unknown AMS command.
0xC	12	0x9811000C	ERR_WIN32ERROR	Win32 error.
0xD	13	0x9811000D	ERR_PORTNOTCONNECTED	Port not connected.
0xE	14	0x9811000E	ERR_INVALIDAMSLENGTH	Invalid AMS length.
0xF	15	0x9811000F	ERR_INVALIDAMSNETID	Invalid AMS Net ID.
0x10	16	0x98110010	ERR_LOWINSTLEVEL	Installation level is too low –TwinCAT 2 license error.
0x11	17	0x98110011	ERR_NODEBUGINTAVAILABLE	No debugging available.
0x12	18	0x98110012	ERR_PORTDISABLED	Port disabled – TwinCAT system service not started.
0x13	19	0x98110013	ERR_PORTALREADYCONNECTED	Port already connected.
0x14	20	0x98110014	ERR_AMSSYNC_W32ERROR	AMS Sync Win32 error.
0x15	21	0x98110015	ERR_AMSSYNC_TIMEOUT	AMS Sync Timeout.
0x16	22	0x98110016	ERR_AMSSYNC_AMSERROR	AMS Sync error.
0x17	23	0x98110017	ERR_AMSSYNC_NOINDEXINMAP	No index map for AMS Sync available.
0x18	24	0x98110018	ERR_INVALIDAMSPORT	Invalid AMS port.
0x19	25	0x98110019	ERR_NOMEMORY	No memory.
0x1A	26	0x9811001A	ERR_TCPSEND	TCP send error.
0x1B	27	0x9811001B	ERR_HOSTUNREACHABLE	Host unreachable.
0x1C	28	0x9811001C	ERR_INVALIDAMSFRAGMENT	Invalid AMS fragment.
0x1D	29	0x9811001D	ERR_TLSSEND	TLS send error – secure ADS connection failed.
0x1E	30	0x9811001E	ERR_ACCESSDENIED	Access denied – secure ADS access denied.

Router error codes

Hex	Dec	HRESULT	Name	Description
0x500	1280	0x98110500	ROUTERERR_NOLOCKEDMEMORY	Locked memory cannot be allocated.
0x501	1281	0x98110501	ROUTERERR_RESIZEMEMORY	The router memory size could not be changed.
0x502	1282	0x98110502	ROUTERERR_MAILBOXFULL	The mailbox has reached the maximum number of possible messages.
0x503	1283	0x98110503	ROUTERERR_DEBUGBOXFULL	The Debug mailbox has reached the maximum number of possible messages.
0x504	1284	0x98110504	ROUTERERR_UNKNOWNPORTTYPE	The port type is unknown.
0x505	1285	0x98110505	ROUTERERR_NOTINITIALIZED	The router is not initialized.
0x506	1286	0x98110506	ROUTERERR_PORTALREADYINUSE	The port number is already assigned.
0x507	1287	0x98110507	ROUTERERR_NOTREGISTERED	The port is not registered.
0x508	1288	0x98110508	ROUTERERR_NOMOREQUEUES	The maximum number of ports has been reached.
0x509	1289	0x98110509	ROUTERERR_INVALIDPORT	The port is invalid.
0x50A	1290	0x9811050A	ROUTERERR_NOTACTIVATED	The router is not active.
0x50B	1291	0x9811050B	ROUTERERR_FRAGMENTBOXFULL	The mailbox has reached the maximum number for fragmented messages.
0x50C	1292	0x9811050C	ROUTERERR_FRAGMENTTIMEOUT	A fragment timeout has occurred.
0x50D	1293	0x9811050D	ROUTERERR_TOBEREMOVED	The port is removed.

General ADS error codes

Hex	Dec	HRESULT	Name	Description
0x700	1792	0x98110700	ADSERR_DEVICE_ERROR	General device error.
0x701	1793	0x98110701	ADSERR_DEVICE_SRVNOTSUPP	Service is not supported by the server.
0x702	1794	0x98110702	ADSERR_DEVICE_INVALIDGRP	Invalid index group.
0x703	1795	0x98110703	ADSERR_DEVICE_INVALIDOFFSET	Invalid index offset.
0x704	1796	0x98110704	ADSERR_DEVICE_INVALIDACCESS	Reading or writing not permitted. Several causes are possible. For example, an incorrect password was entered when creating routes.
0x705	1797	0x98110705	ADSERR_DEVICE_INVALIDSIZE	Parameter size not correct.
0x706	1798	0x98110706	ADSERR_DEVICE_INVALIDDATA	Invalid data values.
0x707	1799	0x98110707	ADSERR_DEVICE_NOTREADY	Device is not ready to operate.
0x708	1800	0x98110708	ADSERR_DEVICE_BUSY	Device is busy.
0x709	1801	0x98110709	ADSERR_DEVICE_INVALIDCONTEXT	Invalid operating system context. This can result from use of ADS blocks in different tasks. It may be possible to resolve this through multitasking synchronization in the PLC.
0x70A	1802	0x9811070A	ADSERR_DEVICE_NOMEMORY	Insufficient memory.
0x70B	1803	0x9811070B	ADSERR_DEVICE_INVALIDPARM	Invalid parameter values.
0x70C	1804	0x9811070C	ADSERR_DEVICE_NOTFOUND	Not found (files, ...).
0x70D	1805	0x9811070D	ADSERR_DEVICE_SYNTAX	Syntax error in file or command.
0x70E	1806	0x9811070E	ADSERR_DEVICE_INCOMPATIBLE	Objects do not match.
0x70F	1807	0x9811070F	ADSERR_DEVICE_EXISTS	Object already exists.
0x710	1808	0x98110710	ADSERR_DEVICE_SYMBOLNOTFOUND	Symbol not found.
0x711	1809	0x98110711	ADSERR_DEVICE_SYMBOLVERSIONINVALID	Invalid symbol version. This can occur due to an online change. Create a new handle.
0x712	1810	0x98110712	ADSERR_DEVICE_INVALIDSTATE	Device (server) is in invalid state.
0x713	1811	0x98110713	ADSERR_DEVICE_TRANSMODENOTSUPP	AdsTransMode not supported.
0x714	1812	0x98110714	ADSERR_DEVICE_NOTIFYHNDINVALID	Notification handle is invalid.
0x715	1813	0x98110715	ADSERR_DEVICE_CLIENTUNKNOWN	Notification client not registered.
0x716	1814	0x98110716	ADSERR_DEVICE_NOMOREHDLS	No further handle available.
0x717	1815	0x98110717	ADSERR_DEVICE_INVALIDWATCHSIZE	Notification size too large.
0x718	1816	0x98110718	ADSERR_DEVICE_NOTINIT	Device not initialized.
0x719	1817	0x98110719	ADSERR_DEVICE_TIMEOUT	Device has a timeout.
0x71A	1818	0x9811071A	ADSERR_DEVICE_NOINTERFACE	Interface query failed.
0x71B	1819	0x9811071B	ADSERR_DEVICE_INVALIDINTERFACE	Wrong interface requested.
0x71C	1820	0x9811071C	ADSERR_DEVICE_INVALIDCLSID	Class ID is invalid.
0x71D	1821	0x9811071D	ADSERR_DEVICE_INVALIDOBJID	Object ID is invalid.
0x71E	1822	0x9811071E	ADSERR_DEVICE_PENDING	Request pending.
0x71F	1823	0x9811071F	ADSERR_DEVICE_ABORTED	Request is aborted.
0x720	1824	0x98110720	ADSERR_DEVICE_WARNING	Signal warning.
0x721	1825	0x98110721	ADSERR_DEVICE_INVALIDARRAYIDX	Invalid array index.
0x722	1826	0x98110722	ADSERR_DEVICE_SYMBOLNOTACTIVE	Symbol not active.
0x723	1827	0x98110723	ADSERR_DEVICE_ACCESSDENIED	Access denied. Several causes are possible. For example, a unidirectional ADS route is used in the opposite direction.
0x724	1828	0x98110724	ADSERR_DEVICE_LICENSENOTFOUND	Missing license.
0x725	1829	0x98110725	ADSERR_DEVICE_LICENSEEXPIRED	License expired.
0x726	1830	0x98110726	ADSERR_DEVICE_LICENSEEXCEEDED	License exceeded.
0x727	1831	0x98110727	ADSERR_DEVICE_LICENSEINVALID	Invalid license.
0x728	1832	0x98110728	ADSERR_DEVICE_LICENSESYSTEMID	License problem: System ID is invalid.
0x729	1833	0x98110729	ADSERR_DEVICE_LICENSENOTIMELIMIT	License not limited in time.
0x72A	1834	0x9811072A	ADSERR_DEVICE_LICENSEFUTUREISSUE	Licensing problem: time in the future.
0x72B	1835	0x9811072B	ADSERR_DEVICE_LICENSETIMETOLONG	License period too long.
0x72C	1836	0x9811072C	ADSERR_DEVICE_EXCEPTION	Exception at system startup.
0x72D	1837	0x9811072D	ADSERR_DEVICE_LICENSEDUPLICATED	License file read twice.
0x72E	1838	0x9811072E	ADSERR_DEVICE_SIGNATUREINVALID	Invalid signature.
0x72F	1839	0x9811072F	ADSERR_DEVICE_CERTIFICATEINVALID	Invalid certificate.
0x730	1840	0x98110730	ADSERR_DEVICE_LICENSEOEMNOTFOUND	Public key not known from OEM.
0x731	1841	0x98110731	ADSERR_DEVICE_LICENSERESTRICTED	License not valid for this system ID.

Hex	Dec	HRESULT	Name	Description
0x732	1842	0x98110732	ADSERR_DEVICE_LICENSEDEMODENIED	Demo license prohibited.
0x733	1843	0x98110733	ADSERR_DEVICE_INVALIDFNCID	Invalid function ID.
0x734	1844	0x98110734	ADSERR_DEVICE_OUTOFRANGE	Outside the valid range.
0x735	1845	0x98110735	ADSERR_DEVICE_INVALIDALIGNMENT	Invalid alignment.
0x736	1846	0x98110736	ADSERR_DEVICE_LICENSEPLATFORM	Invalid platform level.
0x737	1847	0x98110737	ADSERR_DEVICE_FORWARD_PL	Context – forward to passive level.
0x738	1848	0x98110738	ADSERR_DEVICE_FORWARD_DL	Context – forward to dispatch level.
0x739	1849	0x98110739	ADSERR_DEVICE_FORWARD_RT	Context – forward to real-time.
0x740	1856	0x98110740	ADSERR_CLIENT_ERROR	Client error.
0x741	1857	0x98110741	ADSERR_CLIENT_INVALIDPARM	Service contains an invalid parameter.
0x742	1858	0x98110742	ADSERR_CLIENT_LISTEMPTY	Polling list is empty.
0x743	1859	0x98110743	ADSERR_CLIENT_VARUSED	Var connection already in use.
0x744	1860	0x98110744	ADSERR_CLIENT_DUPLINVOKEID	The called ID is already in use.
0x745	1861	0x98110745	ADSERR_CLIENT_SYNCTIMEOUT	Timeout has occurred – the remote terminal is not responding in the specified ADS timeout. The route setting of the remote terminal may be configured incorrectly.
0x746	1862	0x98110746	ADSERR_CLIENT_W32ERROR	Error in Win32 subsystem.
0x747	1863	0x98110747	ADSERR_CLIENT_TIMEOUTINVALID	Invalid client timeout value.
0x748	1864	0x98110748	ADSERR_CLIENT_PORTNOTOPEN	Port not open.
0x749	1865	0x98110749	ADSERR_CLIENT_NOAMSADDR	No AMS address.
0x750	1872	0x98110750	ADSERR_CLIENT_SYNCINTERNAL	Internal error in Ads sync.
0x751	1873	0x98110751	ADSERR_CLIENT_ADDHASH	Hash table overflow.
0x752	1874	0x98110752	ADSERR_CLIENT_REMOVEHASH	Key not found in the table.
0x753	1875	0x98110753	ADSERR_CLIENT_NOMORESYM	No symbols in the cache.
0x754	1876	0x98110754	ADSERR_CLIENT_SYNCRESINVALID	Invalid response received.
0x755	1877	0x98110755	ADSERR_CLIENT_SYNCPORTLOCKED	Sync Port is locked.
0x756	1878	0x98110756	ADSERR_CLIENT_REQUESTCANCELLED	The request was canceled.

RTime error codes

Hex	Dec	HRESULT	Name	Description
0x1000	4096	0x98111000	RTERR_INTERNAL	Internal error in the real-time system.
0x1001	4097	0x98111001	RTERR_BADTIMERPERIODS	Timer value is not valid.
0x1002	4098	0x98111002	RTERR_INVALIDTASKPTR	Task pointer has the invalid value 0 (zero).
0x1003	4099	0x98111003	RTERR_INVALIDSTACKPTR	Stack pointer has the invalid value 0 (zero).
0x1004	4100	0x98111004	RTERR_PRIOEXISTS	The request task priority is already assigned.
0x1005	4101	0x98111005	RTERR_NOMORETCB	No free TCB (Task Control Block) available. The maximum number of TCBs is 64.
0x1006	4102	0x98111006	RTERR_NOMORESEMAS	No free semaphores available. The maximum number of semaphores is 64.
0x1007	4103	0x98111007	RTERR_NOMOREQUEUES	No free space available in the queue. The maximum number of positions in the queue is 64.
0x100D	4109	0x9811100D	RTERR_EXTIRQALREADYDEF	An external synchronization interrupt is already applied.
0x100E	4110	0x9811100E	RTERR_EXTIRQNOTDEF	No external sync interrupt applied.
0x100F	4111	0x9811100F	RTERR_EXTIRQINSTALLFAILED	Application of the external synchronization interrupt has failed.
0x1010	4112	0x98111010	RTERR_IRQLNOTLESSOREQUAL	Call of a service function in the wrong context
0x1017	4119	0x98111017	RTERR_VMXNOTSUPPORTED	Intel® VT-x extension is not supported.
0x1018	4120	0x98111018	RTERR_VMXDISABLED	Intel® VT-x extension is not enabled in the BIOS.
0x1019	4121	0x98111019	RTERR_VMXCONTROLSMISSING	Missing function in Intel® VT-x extension.
0x101A	4122	0x9811101A	RTERR_VMXENABLEFAILS	Activation of Intel® VT-x fails.

Specific positive HRESULT Return Codes:

HRESULT	Name	Description
0x0000_0000	S_OK	No error.
0x0000_0001	S_FALSE	No error. Example: successful processing, but with a negative or incomplete result.
0x0000_0203	S_PENDING	No error. Example: successful processing, but no result is available yet.
0x0000_0256	S_WATCHDOG_TIMEOUT	No error. Example: successful processing, but a timeout occurred.

TCP Winsock error codes

Hex	Dec	Name	Description
0x274C	10060	WSAETIMEDOUT	A connection timeout has occurred - error while establishing the connection, because the remote terminal did not respond properly after a certain period of time, or the established connection could not be maintained because the connected host did not respond.
0x274D	10061	WSAECONNREFUSED	Connection refused - no connection could be established because the target computer has explicitly rejected it. This error usually results from an attempt to connect to a service that is inactive on the external host, that is, a service for which no server application is running.
0x2751	10065	WSAEHOSTUNREACH	No route to host - a socket operation referred to an unavailable host.
More Winsock error codes: Win32 error codes			

7.7 Win32 Error Codes

The following table provides a list of Win32 error codes.

0 [▶ 89], 100 [▶ 91], 200 [▶ 93], 1001 [▶ 95], 1100 [▶ 97], 1200 [▶ 99], 1400 [▶ 104], 1600 [▶ 106], 1800 [▶ 110], 2000 [▶ 112], 3000 [▶ 113], 5000 [▶ 116], 6000 [▶ 119], 8000 [▶ 121], 8500 [▶ 130], 9001 [▶ 134], 10004 [▶ 136], 12000 [▶ 139],

Error			Description
decimal	Hexadecimal	Name	
0	0x00000000	ERROR_SUCCESS	The operation completed successfully.
1	0x00000001	ERROR_INVALID_FUNCTION	Incorrect function.
2	0x00000002	ERROR_FILE_NOT_FOUND	The system cannot find the file specified.
3	0x00000003	ERROR_PATH_NOT_FOUND	The system cannot find the path specified.
4	0x00000004	ERROR_TOO_MANY_OPEN_FILES	The system cannot open the file.
5	0x00000005	ERROR_ACCESS_DENIED	Access is denied.
6	0x00000006	ERROR_INVALID_HANDLE	The handle is invalid.
7	0x00000007	ERROR_ARENA_TRASHED	The storage control blocks were destroyed.
8	0x00000008	ERROR_NOT_ENOUGH_MEMORY	Not enough storage is available to process this command.
9	0x00000009	ERROR_INVALID_BLOCK	The storage control block address is invalid.
10	0x0000000A	ERROR_BAD_ENVIRONMENT	The environment is incorrect.
11	0x0000000B	ERROR_BAD_FORMAT	An attempt was made to load a program with an incorrect format.
12	0x0000000C	ERROR_INVALID_ACCESS	The access code is invalid.
13	0x0000000D	ERROR_INVALID_DATA	The data is invalid.
14	0x0000000E	ERROR_OUTOFMEMORY	Not enough storage is available to complete this operation.
15	0x0000000F	ERROR_INVALID_DRIVE	The system cannot find the drive specified.
16	0x00000010	ERROR_CURRENT_DIRECTORY	The directory cannot be removed.
17	0x00000011	ERROR_NOT_SAME_DEVICE	The system cannot move the file to a different disk drive.
18	0x00000012	ERROR_NO_MORE_FILES	There are no more files.
19	0x00000013	ERROR_WRITE_PROTECT	The media is write protected.
20	0x00000014	ERROR_BAD_UNIT	The system cannot find the device specified.
21	0x00000015	ERROR_NOT_READY	The device is not ready.
22	0x00000016	ERROR_BAD_COMMAND	The device does not recognize the command.
23	0x00000017	ERROR_CRC	Data error (cyclic redundancy check).
24	0x00000018	ERROR_BAD_LENGTH	The program issued a command but the command length is incorrect.
25	0x00000019	ERROR_SEEK	The drive cannot locate a specific area or track on the disk.
26	0x0000001A	ERROR_NOT_DOS_DISK	The specified disk or diskette cannot be accessed.
27	0x0000001B	ERROR_SECTOR_NOT_FOUND	The drive cannot find the sector requested.
28	0x0000001C	ERROR_OUT_OF_PAPER	The printer is out of paper.
29	0x0000001D	ERROR_WRITE_FAULT	The system cannot write to the specified device.
30	0x0000001E	ERROR_READ_FAULT	The system cannot read from the specified device.
31	0x0000001F	ERROR_GEN_FAILURE	A device attached to the system is not functioning.
32	0x00000020	ERROR_SHARING_VIOLATION	The process cannot access the file because it is being used by another process.
33	0x00000021	ERROR_LOCK_VIOLATION	The process cannot access the file because another process has locked a portion of the file.
34	0x00000022	ERROR_WRONG_DISK	The wrong diskette is in the drive. Insert %2 (Volume Serial Number: %3) into drive %1.
36	0x00000024	ERROR_SHARING_BUFFER_EXCEEDED	Too many files opened for sharing.
38	0x00000026	ERROR_HANDLE_EOF	Reached the end of the file.
39	0x00000027	ERROR_HANDLE_DISK_FULL	The disk is full.
50	0x00000032	ERROR_NOT_SUPPORTED	The request is not supported.
51	0x00000033	ERROR_REM_NOT_LIST	The remote computer is not available.
52	0x00000034	ERROR_DUP_NAME	A duplicate name exists on the network.
53	0x00000035	ERROR_BAD_NETPATH	The network path was not found.
54	0x00000036	ERROR_NETWORK_BUSY	The network is busy.
55	0x00000037	ERROR_DEV_NOT_EXIST	The specified network resource or device is no longer available.
56	0x00000038	ERROR_TOO_MANY_CMDS	The network BIOS command limit has been reached.
57	0x00000039	ERROR_ADAP_HDW_ERR	A network adapter hardware error occurred.

Error			Description
decimal	Hexadecimal	Name	
58	0x0000003A	ERROR_BAD_NET_RESP	The specified server cannot perform the requested operation.
59	0x0000003B	ERROR_UNEXP_NET_ERR	An unexpected network error occurred.
60	0x0000003C	ERROR_BAD_REM_ADAP	The remote adapter is not compatible.
61	0x0000003D	ERROR_PRINTQ_FULL	The printer queue is full.
62	0x0000003E	ERROR_NO_SPOOL_SPACE	Space to store the file waiting to be printed is not available on the server.
63	0x0000003F	ERROR_PRINT_CANCELLED	Your file waiting to be printed was deleted.
64	0x00000040	ERROR_NETNAME_DELETED	The specified network name is no longer available.
65	0x00000041	ERROR_NETWORK_ACCESS_DENIED	Network access is denied.
66	0x00000042	ERROR_BAD_DEV_TYPE	The network resource type is not correct.
67	0x00000043	ERROR_BAD_NET_NAME	The network name cannot be found.
68	0x00000044	ERROR_TOO_MANY_NAMES	The name limit for the local computer network adapter card was exceeded.
69	0x00000045	ERROR_TOO_MANY_SESS	The network BIOS session limit was exceeded.
70	0x00000046	ERROR_SHARING_PAUSED	The remote server has been paused or is in the process of being started.
71	0x00000047	ERROR_REQ_NOT_ACCEP	No more connections can be made to this remote computer at this time because there are already as many connections as the computer can accept.
72	0x00000048	ERROR_REDIR_PAUSED	The specified printer or disk device has been paused.
80	0x00000050	ERROR_FILE_EXISTS	The file exists.
82	0x00000052	ERROR_CANNOT_MAKE	The directory or file cannot be created.
83	0x00000053	ERROR_FAIL_I24	Fail on INT 24.
84	0x00000054	ERROR_OUT_OF_STRUCTURES	Storage to process this request is not available.
85	0x00000055	ERROR_ALREADY_ASSIGNED	The local device name is already in use.
86	0x00000056	ERROR_INVALID_PASSWORD	The specified network password is not correct.
87	0x00000057	ERROR_INVALID_PARAMETER	The parameter is incorrect.
88	0x00000058	ERROR_NET_WRITE_FAULT	A write fault occurred on the network.
89	0x00000059	ERROR_NO_PROC_SLOTS	The system cannot start another process at this time.

Error			Description
decimal	Hexadecimal	Name	
100	0x00000064	ERROR_TOO_MANY_SEMAPHORES	Cannot create another system semaphore.
101	0x00000065	ERROR_EXCL_SEM_ALREADY_OWNED	The exclusive semaphore is owned by another process.
102	0x00000066	ERROR_SEM_IS_SET	The semaphore is set and cannot be closed.
103	0x00000067	ERROR_TOO_MANY_SEM_REQUESTS	The semaphore cannot be set again.
104	0x00000068	ERROR_INVALID_AT_INTERRUPT_TIME	Cannot request exclusive semaphores at interrupt time.
105	0x00000069	ERROR_SEM_OWNER_DIED	The previous ownership of this semaphore has ended.
106	0x0000006A	ERROR_SEM_USER_LIMIT	Insert the diskette for drive %1.
107	0x0000006B	ERROR_DISK_CHANGE	The program stopped because an alternate diskette was not inserted.
108	0x0000006C	ERROR_DRIVE_LOCKED	The disk is in use or locked by another process.
109	0x0000006D	ERROR_BROKEN_PIPE	The pipe has been ended.
110	0x0000006E	ERROR_OPEN_FAILED	The system cannot open the device or file specified.
111	0x0000006F	ERROR_BUFFER_OVERFLOW	The file name is too long.
112	0x00000070	ERROR_DISK_FULL	There is not enough space on the disk.
113	0x00000071	ERROR_NO_MORE_SEARCH_HANDLES	No more internal file identifiers available.
114	0x00000072	ERROR_INVALID_TARGET_HANDLE	The target internal file identifier is incorrect.
117	0x00000075	ERROR_INVALID_CATEGORY	The IOCTL call made by the application program is not correct.
118	0x00000076	ERROR_INVALID_VERIFY_SWITCH	The verify-on-write switch parameter value is not correct.
119	0x00000077	ERROR_BAD_DRIVER_LEVEL	The system does not support the command requested.
120	0x00000078	ERROR_CALL_NOT_IMPLEMENTED	This function is not supported on this system.
121	0x00000079	ERROR_SEM_TIMEOUT	The semaphore timeout period has expired.
122	0x0000007A	ERROR_INSUFFICIENT_BUFFER	The data area passed to a system call is too small.
123	0x0000007B	ERROR_INVALID_NAME	The filename, directory name, or volume label syntax is incorrect.
124	0x0000007C	ERROR_INVALID_LEVEL	The system call level is not correct.
125	0x0000007D	ERROR_NO_VOLUME_LABEL	The disk has no volume label.
126	0x0000007E	ERROR_MOD_NOT_FOUND	The specified module could not be found.
127	0x0000007F	ERROR_PROC_NOT_FOUND	The specified procedure could not be found.
128	0x00000080	ERROR_WAIT_NO_CHILDREN	There are no child processes to wait for.
129	0x00000081	ERROR_CHILD_NOT_COMPLETE	The %1 application cannot be run in Win32 mode.
130	0x00000082	ERROR_DIRECT_ACCESS_HANDLE	Attempt to use a file handle to an open disk partition for an operation other than raw disk I/O.
131	0x00000083	ERROR_NEGATIVE_SEEK	An attempt was made to move the file pointer before the beginning of the file.
132	0x00000084	ERROR_SEEK_ON_DEVICE	The file pointer cannot be set on the specified device or file.
133	0x00000085	ERROR_IS_JOIN_TARGET	A JOIN or SUBST command cannot be used for a drive that contains previously joined drives.
134	0x00000086	ERROR_IS_JOINED	An attempt was made to use a JOIN or SUBST command on a drive that has already been joined.
135	0x00000087	ERROR_IS_SUBSTED	An attempt was made to use a JOIN or SUBST command on a drive that has already been substituted.
136	0x00000088	ERROR_NOT_JOINED	The system tried to delete the JOIN of a drive that is not joined.
137	0x00000089	ERROR_NOT_SUBSTED	The system tried to delete the substitution of a drive that is not substituted.
138	0x0000008A	ERROR_JOIN_TO_JOIN	The system tried to join a drive to a directory on a joined drive.
139	0x0000008B	ERROR_SUBST_TO_SUBST	The system tried to substitute a drive to a directory on a substituted drive.
140	0x0000008C	ERROR_JOIN_TO_SUBST	The system tried to join a drive to a directory on a substituted drive.
141	0x0000008D	ERROR_SUBST_TO_JOIN	The system tried to SUBST a drive to a directory on a joined drive.

Error			Description
decimal	Hexadecimal	Name	
142	0x0000008E	ERROR_BUSY_DRIVE	The system cannot perform a JOIN or SUBST at this time.
143	0x0000008F	ERROR_SAME_DRIVE	The system cannot join or substitute a drive to or for a directory on the same drive.
144	0x00000090	ERROR_DIR_NOT_ROOT	The directory is not a subdirectory of the root directory.
145	0x00000091	ERROR_DIR_NOT_EMPTY	The directory is not empty.
146	0x00000092	ERROR_IS_SUBST_PATH	The path specified is being used in a substitute.
147	0x00000093	ERROR_IS_JOIN_PATH	Not enough resources are available to process this command.
148	0x00000094	ERROR_PATH_BUSY	The path specified cannot be used at this time.
149	0x00000095	ERROR_IS_SUBST_TARGET	An attempt was made to join or substitute a drive for which a directory on the drive is the target of a previous substitute.
150	0x00000096	ERROR_SYSTEM_TRACE	System trace information was not specified in your CONFIG.SYS file, or tracing is disallowed.
151	0x00000097	ERROR_INVALID_EVENT_COUNT	The number of specified semaphore events for DosMuxSemWait is not correct.
152	0x00000098	ERROR_TOO_MANY_MUXWAITERS	DosMuxSemWait did not execute; too many semaphores are already set.
153	0x00000099	ERROR_INVALID_LIST_FORMAT	The DosMuxSemWait list is not correct.
154	0x0000009A	ERROR_LABEL_TOO_LONG	The volume label you entered exceeds the label character limit of the target file system.
155	0x0000009B	ERROR_TOO_MANY_TCBS	Cannot create another thread.
156	0x0000009C	ERROR_SIGNAL_REFUSED	The recipient process has refused the signal.
157	0x0000009D	ERROR_DISCARDED	The segment is already discarded and cannot be locked.
158	0x0000009E	ERROR_NOT_LOCKED	The segment is already unlocked.
159	0x0000009F	ERROR_BAD_THREADID_ADDR	The address for the thread ID is not correct.
160	0x000000A0	ERROR_BAD_ARGUMENTS	The argument string passed to DosExecPgm is not correct.
161	0x000000A1	ERROR_BAD_PATHNAME	The specified path is invalid.
162	0x000000A2	ERROR_SIGNAL_PENDING	A signal is already pending.
164	0x000000A4	ERROR_MAX_THRDS_REACHED	No more threads can be created in the system.
167	0x000000A7	ERROR_LOCK_FAILED	Unable to lock a region of a file.
170	0x000000AA	ERROR_BUSY	The requested resource is in use.
173	0x000000AD	ERROR_CANCEL_VIOLATION	A lock request was not outstanding for the supplied cancel region.
174	0x000000AE	ERROR_ATOMIC_LOCKS_NOT_SUPPORTED	The file system does not support atomic changes to the lock type.
180	0x000000B4	ERROR_INVALID_SEGMENT_NUMBER	The system detected a segment number that was not correct.
182	0x000000B6	ERROR_INVALID_ORDINAL	The operating system cannot run %1.
183	0x000000B7	ERROR_ALREADY_EXISTS	Cannot create a file when that file already exists.
186	0x000000BA	ERROR_INVALID_FLAG_NUMBER	The flag passed is not correct.
187	0x000000BB	ERROR_SEM_NOT_FOUND	The specified system semaphore name was not found.
188	0x000000BC	ERROR_INVALID_STARTING_CODESEG	The operating system cannot run %1.
189	0x000000BD	ERROR_INVALID_STACKSEG	The operating system cannot run %1.
190	0x000000BE	ERROR_INVALID_MODULETYPE	The operating system cannot run %1.
191	0x000000BF	ERROR_INVALID_EXE_SIGNATURE	Cannot run %1 in Win32 mode.
192	0x000000C0	ERROR_EXE_MARKED_INVALID	The operating system cannot run %1.
193	0x000000C1	ERROR_BAD_EXE_FORMAT	%1 is not a valid Win32 application.
194	0x000000C2	ERROR_ITERATED_DATA_EXCEEDS_64k	The operating system cannot run %1.
195	0x000000C3	ERROR_INVALID_MINALLOCSIZE	The operating system cannot run %1.
196	0x000000C4	ERROR_DYNLINK_FROM_INVALID_RING	The operating system cannot run this application program.
197	0x000000C5	ERROR_IOPL_NOT_ENABLED	The operating system is not presently configured to run this application.
198	0x000000C6	ERROR_INVALID_SEGDPL	The operating system cannot run %1.
199	0x000000C7	ERROR_AUTODATASEG_EXCEEDS_64k	The operating system cannot run this application program.

Error			Description
decimal	Hexadecimal	Name	
200	0x000000C8	ERROR_RING2SEG_MUST_BE_MOVABLE	The code segment cannot be greater than or equal to 64K.
201	0x000000C9	ERROR_RELOC_CHAIN_XEEDS_SEGLIM	The operating system cannot run %1.
202	0x000000CA	ERROR_INFLOOP_IN_RELOC_CHAIN	The operating system cannot run %1.
203	0x000000CB	ERROR_ENVVAR_NOT_FOUND	The system could not find the environment option that was entered.
205	0x000000CD	ERROR_NO_SIGNAL_SENT	No process in the command subtree has a signal handler.
206	0x000000CE	ERROR_FILENAME_EXCED_RANGE	The filename or extension is too long.
207	0x000000CF	ERROR_RING2_STACK_IN_USE	The ring 2 stack is in use.
208	0x000000D0	ERROR_META_EXPANSION_TOO_LONG	The global filename characters, * or ?, are entered incorrectly or too many global filename characters are specified.
209	0x000000D1	ERROR_INVALID_SIGNAL_NUMBER	The signal being posted is not correct.
210	0x000000D2	ERROR_THREAD_1_INACTIVE	The signal handler cannot be set.
212	0x000000D4	ERROR_LOCKED	The segment is locked and cannot be reallocated.
214	0x000000D6	ERROR_TOO_MANY_MODULES	Too many dynamic-link modules are attached to this program or dynamic-link module.
215	0x000000D7	ERROR_NESTING_NOT_ALLOWED	Cannot nest calls to LoadModule.
216	0x000000D8	ERROR_EXE_MACHINE_TYPE_MISMATCH	The image file %1 is valid, but is for a machine type other than the current machine.
230	0x000000E6	ERROR_BAD_PIPE	The pipe state is invalid.
231	0x000000E7	ERROR_PIPE_BUSY	All pipe instances are busy.
232	0x000000E8	ERROR_NO_DATA	The pipe is being closed.
233	0x000000E9	ERROR_PIPE_NOT_CONNECTED	No process is on the other end of the pipe.
234	0x000000EA	ERROR_MORE_DATA	More data is available.
240	0x000000F0	ERROR_VC_DISCONNECTED	The session was canceled.
254	0x000000FE	ERROR_INVALID_EA_NAME	The specified extended attribute name was invalid.
255	0x000000FF	ERROR_EA_LIST_INCONSISTENT	The extended attributes are inconsistent.
258	0x00000102	WAIT_TIMEOUT	The wait operation timed out.
259	0x00000103	ERROR_NO_MORE_ITEMS	No more data is available.
266	0x0000010A	ERROR_CANNOT_COPY	The copy functions cannot be used.
267	0x0000010B	ERROR_DIRECTORY	The directory name is invalid.
275	0x00000113	ERROR_EAS_DIDNT_FIT	The extended attributes did not fit in the buffer.
276	0x00000114	ERROR_EA_FILE_CORRUPT	The extended attribute file on the mounted file system is corrupt.
277	0x00000115	ERROR_EA_TABLE_FULL	The extended attribute table file is full.
278	0x00000116	ERROR_INVALID_EA_HANDLE	The specified extended attribute handle is invalid.
282	0x0000011A	ERROR_EAS_NOT_SUPPORTED	The mounted file system does not support extended attributes.
288	0x00000120	ERROR_NOT_OWNER	Attempt to release mutex not owned by caller.
298	0x0000012A	ERROR_TOO_MANY_POSTS	Too many posts were made to a semaphore.
299	0x0000012B	ERROR_PARTIAL_COPY	Only part of a ReadProcessMemory or WriteProcessMemory request was completed.
300	0x0000012C	ERROR_OPLOCK_NOT_GRANTED	The oplock request is denied.
301	0x0000012D	ERROR_INVALID_OPLOCK_PROTOCOL	An invalid oplock acknowledgment was received by the system.
302	0x0000012E	ERROR_DISK_TOO_FRAGMENTED	The volume is too fragmented to complete this operation.
303	0x0000012F	ERROR_DELETE_PENDING	The file cannot be opened because it is in the process of being deleted.
317	0x0000013D	ERROR_MR_MID_NOT_FOUND	The system cannot find message text for message number 0x%1 in the message file for %2.
487	0x000001E7	ERROR_INVALID_ADDRESS	Attempt to access invalid address.
534	0x00000216	ERROR_ARITHMETIC_OVERFLOW	Arithmetic result exceeded 32 bits.
535	0x00000217	ERROR_PIPE_CONNECTED	There is a process on other end of the pipe.
536	0x00000218	ERROR_PIPE_LISTENING	Waiting for a process to open the other end of the pipe.
994	0x000003E2	ERROR_EA_ACCESS_DENIED	Access to the extended attribute was denied.

Error			Description
decimal	Hexadecimal	Name	
995	0x000003E3	ERROR_OPERATION_ABORTED	The I/O operation has been aborted because of either a thread exit or an application request.
996	0x000003E4	ERROR_IO_INCOMPLETE	Overlapped I/O event is not in a signaled state.
997	0x000003E5	ERROR_IO_PENDING	Overlapped I/O operation is in progress.
998	0x000003E6	ERROR_NOACCESS	Invalid access to memory location.
999	0x000003E7	ERROR_SWAPERROR	Error performing inpage operation.

Error			Description
decimal	Hexadecimal	Name	
1001	0x000003E9	ERROR_STACK_OVERFLOW	Recursion too deep; the stack overflowed.
1002	0x000003EA	ERROR_INVALID_MESSAGE	The window cannot act on the sent message.
1003	0x000003EB	ERROR_CAN_NOT_COMPLETE	Cannot complete this function.
1004	0x000003EC	ERROR_INVALID_FLAGS	Invalid flags.
1005	0x000003ED	ERROR_UNRECOGNIZED_VOLUME	The volume does not contain a recognized file system. Please make sure that all required file system drivers are loaded and that the volume is not corrupted.
1006	0x000003EE	ERROR_FILE_INVALID	The volume for a file has been externally altered so that the opened file is no longer valid.
1007	0x000003EF	ERROR_FULLSCREEN_MODE	The requested operation cannot be performed in full-screen mode.
1008	0x000003F0	ERROR_NO_TOKEN	An attempt was made to reference a token that does not exist.
1009	0x000003F1	ERROR_BADDB	The configuration registry database is corrupt.
1010	0x000003F2	ERROR_BADKEY	The configuration registry key is invalid.
1011	0x000003F3	ERROR_CANTOPEN	The configuration registry key could not be opened.
1012	0x000003F4	ERROR_CANTREAD	The configuration registry key could not be read.
1013	0x000003F5	ERROR_CANTWRITE	The configuration registry key could not be written.
1014	0x000003F6	ERROR_REGISTRY_RECOVERED	One of the files in the registry database had to be recovered by use of a log or alternate copy. The recovery was successful.
1015	0x000003F7	ERROR_REGISTRY_CORRUPT	The registry is corrupted. The structure of one of the files containing registry data is corrupted, or the system's memory image of the file is corrupted, or the file could not be recovered because the alternate copy or log was absent or corrupted.
1016	0x000003F8	ERROR_REGISTRY_IO_FAILED	An I/O operation initiated by the registry failed unrecoverably. The registry could not read in, or write out, or flush, one of the files that contain the system's image of the registry.
1017	0x000003F9	ERROR_NOT_REGISTRY_FILE	The system has attempted to load or restore a file into the registry, but the specified file is not in a registry file format.
1018	0x000003FA	ERROR_KEY_DELETED	Illegal operation attempted on a registry key that has been marked for deletion.
1019	0x000003FB	ERROR_NO_LOG_SPACE	System could not allocate the required space in a registry log.
1020	0x000003FC	ERROR_KEY_HAS_CHILDREN	Cannot create a symbolic link in a registry key that already has subkeys or values.
1021	0x000003FD	ERROR_CHILD_MUST_BE_VOLATILE	Cannot create a stable subkey under a volatile parent key.
1022	0x000003FE	ERROR_NOTIFY_ENUM_DIR	A notify change request is being completed and the information is not being returned in the caller's buffer. The caller now needs to enumerate the files to find the changes.
1051	0x0000041B	ERROR_DEPENDENT_SERVICES_RUNNING	A stop control has been sent to a service that other running services are dependent on.
1052	0x0000041C	ERROR_INVALID_SERVICE_CONTROL	The requested control is not valid for this service.
1053	0x0000041D	ERROR_SERVICE_REQUEST_TIMEOUT	The service did not respond to the start or control request in a timely fashion.
1054	0x0000041E	ERROR_SERVICE_NO_THREAD	A thread could not be created for the service.
1055	0x0000041F	ERROR_SERVICE_DATABASE_LOCKED	The service database is locked.
1056	0x00000420	ERROR_SERVICE_ALREADY_RUNNING	An instance of the service is already running.
1057	0x00000421	ERROR_INVALID_SERVICE_ACCOUNT	The account name is invalid or does not exist, or the password is invalid for the account name specified.
1058	0x00000422	ERROR_SERVICE_DISABLED	The service cannot be started, either because it is disabled or because it has no enabled devices associated with it.
1059	0x00000423	ERROR_CIRCULAR_DEPENDENCY	Circular service dependency was specified.

Error			Description
decimal	Hexadecimal	Name	
1060	0x00000424	ERROR_SERVICE_DOES_NOT_EXIST	The specified service does not exist as an installed service.
1061	0x00000425	ERROR_SERVICE_CANNOT_ACCEPT_CTRL	The service cannot accept control messages at this time.
1062	0x00000426	ERROR_SERVICE_NOT_ACTIVE	The service has not been started.
1063	0x00000427	ERROR_FAILED_SERVICE_CONTROLLER_CONNECT	The service process could not connect to the service controller.
1064	0x00000428	ERROR_EXCEPTION_IN_SERVICE	An exception occurred in the service when handling the control request.
1065	0x00000429	ERROR_DATABASE_DOES_NOT_EXIST	The database specified does not exist.
1066	0x0000042A	ERROR_SERVICE_SPECIFIC_ERROR	The service has returned a service-specific error code.
1067	0x0000042B	ERROR_PROCESS_ABORTED	The process terminated unexpectedly.
1068	0x0000042C	ERROR_SERVICE_DEPENDENCY_FAIL	The dependency service or group failed to start.
1069	0x0000042D	ERROR_SERVICE_LOGON_FAILED	The service did not start due to a logon failure.
1070	0x0000042E	ERROR_SERVICE_START_HANG	After starting, the service hung in a start-pending state.
1071	0x0000042F	ERROR_INVALID_SERVICE_LOCK	The specified service database lock is invalid.
1072	0x00000430	ERROR_SERVICE_MARKED_FOR_DELETE	The specified service has been marked for deletion.
1073	0x00000431	ERROR_SERVICE_EXISTS	The specified service already exists.
1074	0x00000432	ERROR_ALREADY_RUNNING_LKG	The system is currently running with the last-known-good configuration.
1075	0x00000433	ERROR_SERVICE_DEPENDENCY_DELETED	The dependency service does not exist or has been marked for deletion.
1076	0x00000434	ERROR_BOOT_ALREADY_ACCEPTED	The current boot has already been accepted for use as the last-known-good control set.
1077	0x00000435	ERROR_SERVICE_NEVER_STARTED	No attempts to start the service have been made since the last boot.
1078	0x00000436	ERROR_DUPLICATE_SERVICE_NAME	The name is already in use as either a service name or a service display name.
1079	0x00000437	ERROR_DIFFERENT_SERVICE_ACCOUNT	The account specified for this service is different from the account specified for other services running in the same process.
1080	0x00000438	ERROR_CANNOT_DETECT_DRIVER_FAILURE	Failure actions can only be set for Win32 services, not for drivers.
1081	0x00000439	ERROR_CANNOT_DETECT_PROCESS_ABORT	This service runs in the same process as the service control manager. Therefore, the service control manager cannot take action if this service's process terminates unexpectedly.
1082	0x0000043A	ERROR_NO_RECOVERY_PROGRAM	No recovery program has been configured for this service.
1083	0x0000043B	ERROR_SERVICE_NOT_IN_EXE	The executable program that this service is configured to run in does not implement the service.
1084	0x0000043C	ERROR_NOT_SAFEBOOT_SERVICE	This service cannot be started in Safe Mode.

Error			Description
decimal	Hexadecimal	Name	
1100	0x0000044C	ERROR_END_OF_MEDIA	The physical end of the tape has been reached.
1101	0x0000044D	ERROR_FILEMARK_DETECTED	A tape access reached a filemark.
1102	0x0000044E	ERROR_BEGINNING_OF_MEDIA	The beginning of the tape or a partition was encountered.
1103	0x0000044F	ERROR_SETMARK_DETECTED	A tape access reached the end of a set of files.
1104	0x00000450	ERROR_NO_DATA_DETECTED	No more data is on the tape.
1105	0x00000451	ERROR_PARTITION_FAILURE	Tape could not be partitioned.
1106	0x00000452	ERROR_INVALID_BLOCK_LENGTH	When accessing a new tape of a multivolume partition, the current block size is incorrect.
1107	0x00000453	ERROR_DEVICE_NOT_PARTITIONED	Tape partition information could not be found when loading a tape.
1108	0x00000454	ERROR_UNABLE_TO_LOCK_MEDIA	Unable to lock the media eject mechanism.
1109	0x00000455	ERROR_UNABLE_TO_UNLOAD_MEDIA	Unable to unload the media.
1110	0x00000456	ERROR_MEDIA_CHANGED	The media in the drive may have changed.
1111	0x00000457	ERROR_BUS_RESET	The I/O bus was reset.
1112	0x00000458	ERROR_NO_MEDIA_IN_DRIVE	No media in drive.
1113	0x00000459	ERROR_NO_UNICODE_TRANSLATION	No mapping for the Unicode character exists in the target multi-byte code page.
1114	0x0000045A	ERROR_DLL_INIT_FAILED	A dynamic link library (DLL) initialization routine failed.
1115	0x0000045B	ERROR_SHUTDOWN_IN_PROGRESS	A system shutdown is in progress.
1116	0x0000045C	ERROR_NO_SHUTDOWN_IN_PROGRESS	Unable to abort the system shutdown because no shutdown was in progress.
1117	0x0000045D	ERROR_IO_DEVICE	The request could not be performed because of an I/O device error.
1118	0x0000045E	ERROR_SERIAL_NO_DEVICE	No serial device was successfully initialized. The serial driver will unload.
1119	0x0000045F	ERROR_IRQ_BUSY	Unable to open a device that was sharing an interrupt request (IRQ) with other devices. At least one other device that uses that IRQ was already opened.
1120	0x00000460	ERROR_MORE_WRITES	A serial I/O operation was completed by another write to the serial port. (The IOCTL_SERIAL_XOFF_COUNTER reached zero.)
1121	0x00000461	ERROR_COUNTER_TIMEOUT	A serial I/O operation completed because the timeout period expired. (The IOCTL_SERIAL_XOFF_COUNTER did not reach zero.)
1122	0x00000462	ERROR_FLOPPY_ID_MARK_NOT_FOUND	No ID address mark was found on the floppy disk.
1123	0x00000463	ERROR_FLOPPY_WRONG_CYLINDER	Mismatch between the floppy disk sector ID field and the floppy disk controller track address.
1124	0x00000464	ERROR_FLOPPY_UNKNOWN_ERROR	The floppy disk controller reported an error that is not recognized by the floppy disk driver.
1125	0x00000465	ERROR_FLOPPY_BAD_REGISTERS	The floppy disk controller returned inconsistent results in its registers.
1126	0x00000466	ERROR_DISK_RECALIBRATE_FAILED	While accessing the hard disk, a recalibrate operation failed, even after retries.
1127	0x00000467	ERROR_DISK_OPERATION_FAILED	While accessing the hard disk, a disk operation failed even after retries.
1128	0x00000468	ERROR_DISK_RESET_FAILED	While accessing the hard disk, a disk controller reset was needed, but even that failed.
1129	0x00000469	ERROR_EOM_OVERFLOW	Physical end of tape encountered.
1130	0x0000046A	ERROR_NOT_ENOUGH_SERVER_MEMORY	Not enough server storage is available to process this command.
1131	0x0000046B	ERROR_POSSIBLE_DEADLOCK	A potential deadlock condition has been detected.
1132	0x0000046C	ERROR_MAPPED_ALIGNMENT	The base address or the file offset specified does not have the proper alignment.
1140	0x00000474	ERROR_SET_POWER_STATE_VETOED	An attempt to change the system power state was vetoed by another application or driver.
1141	0x00000475	ERROR_SET_POWER_STATE_FAILED	The system BIOS failed an attempt to change the system power state.
1142	0x00000476	ERROR_TOO_MANY_LINKS	An attempt was made to create more links on a file than the file system supports.

Error			Description
decimal	Hexadecimal	Name	
1150	0x0000047E	ERROR_OLD_WIN_VERSION	The specified program requires a newer version of Windows.
1151	0x0000047F	ERROR_APP_WRONG_OS	The specified program is not a Windows or MS-DOS program.
1152	0x00000480	ERROR_SINGLE_INSTANCE_APP	Cannot start more than one instance of the specified program.
1153	0x00000481	ERROR_RMODE_APP	The specified program was written for an earlier version of Windows.
1154	0x00000482	ERROR_INVALID_DLL	One of the library files needed to run this application is damaged.
1155	0x00000483	ERROR_NO_ASSOCIATION	No application is associated with the specified file for this operation.
1156	0x00000484	ERROR_DDE_FAIL	An error occurred in sending the command to the application.
1157	0x00000485	ERROR_DLL_NOT_FOUND	One of the library files needed to run this application cannot be found.
1158	0x00000486	ERROR_NO_MORE_USER_HANDLES	The current process has used all of its system allowance of handles for Window Manager objects.
1159	0x00000487	ERROR_MESSAGE_SYNC_ONLY	The message can be used only with synchronous operations.
1160	0x00000488	ERROR_SOURCE_ELEMENT_EMPTY	The indicated source element has no media.
1161	0x00000489	ERROR_DESTINATION_ELEMENT_FULL	The indicated destination element already contains media.
1162	0x0000048A	ERROR_ILLEGAL_ELEMENT_ADDRESS	The indicated element does not exist.
1163	0x0000048B	ERROR_MAGAZINE_NOT_PRESENT	The indicated element is part of a magazine that is not present.
1164	0x0000048C	ERROR_DEVICE_REINITIALIZATION_NEEDED	The indicated device requires reinitialization due to hardware errors.
1165	0x0000048D	ERROR_DEVICE_REQUIRES_CLEANING	The device has indicated that cleaning is required before further operations are attempted.
1166	0x0000048E	ERROR_DEVICE_DOOR_OPEN	The device has indicated that its door is open.
1167	0x0000048F	ERROR_DEVICE_NOT_CONNECTED	The device is not connected.
1168	0x00000490	ERROR_NOT_FOUND	Element not found.
1169	0x00000491	ERROR_NO_MATCH	There was no match for the specified key in the index.
1170	0x00000492	ERROR_SET_NOT_FOUND	The property set specified does not exist on the object.
1171	0x00000493	ERROR_POINT_NOT_FOUND	The point passed to GetMouseMovePointsEx is not in the buffer.
1172	0x00000494	ERROR_NO_TRACKING_SERVICE	The tracking (workstation) service is not running.
1173	0x00000495	ERROR_NO_VOLUME_ID	The Volume ID could not be found.
1175	0x00000497	ERROR_UNABLE_TO_REMOVE_REPLACED	Unable to remove the file to be replaced.
1176	0x00000498	ERROR_UNABLE_TO_MOVE_REPLACEMENT	Unable to move the replacement file to the file to be replaced. The file to be replaced has retained its original name.
1177	0x00000499	ERROR_UNABLE_TO_MOVE_REPLACEMENT_2	Unable to move the replacement file to the file to be replaced. The file to be replaced has been renamed using the backup name.
1178	0x0000049A	ERROR_JOURNAL_DELETE_IN_PROGRESS	The volume change journal is being deleted.
1179	0x0000049B	ERROR_JOURNAL_NOT_ACTIVE	The volume change journal is not active.
1180	0x0000049C	ERROR_POTENTIAL_FILE_FOUND	A file was found, but it may not be the correct file.
1181	0x0000049D	ERROR_JOURNAL_ENTRY_DELETED	The journal entry has been deleted from the journal.

Error			Description
decimal	Hexadecimal	Name	
1200	0x000004B0	ERROR_BAD_DEVICE	The specified device name is invalid.
1201	0x000004B1	ERROR_CONNECTION_UNAVAIL	The device is not currently connected but it is a remembered connection.
1202	0x000004B2	ERROR_DEVICE_ALREADY_REMEMBERED	The local device name has a remembered connection to another network resource.
1203	0x000004B3	ERROR_NO_NET_OR_BAD_PATH	No network provider accepted the given network path.
1204	0x000004B4	ERROR_BAD_PROVIDER	The specified network provider name is invalid.
1205	0x000004B5	ERROR_CANNOT_OPEN_PROFILE	Unable to open the network connection profile.
1206	0x000004B6	ERROR_BAD_PROFILE	The network connection profile is corrupted.
1207	0x000004B7	ERROR_NOT_CONTAINER	Cannot enumerate a noncontainer.
1208	0x000004B8	ERROR_EXTENDED_ERROR	An extended error has occurred.
1209	0x000004B9	ERROR_INVALID_GROUPNAME	The format of the specified group name is invalid.
1210	0x000004BA	ERROR_INVALID_COMPUTERNAME	The format of the specified computer name is invalid.
1211	0x000004BB	ERROR_INVALID_EVENTNAME	The format of the specified event name is invalid.
1212	0x000004BC	ERROR_INVALID_DOMAINNAME	The format of the specified domain name is invalid.
1213	0x000004BD	ERROR_INVALID_SERVICENAME	The format of the specified service name is invalid.
1214	0x000004BE	ERROR_INVALID_NETNAME	The format of the specified network name is invalid.
1215	0x000004BF	ERROR_INVALID_SHARENAME	The format of the specified share name is invalid.
1216	0x000004C0	ERROR_INVALID_PASSWORDNAME	The format of the specified password is invalid.
1217	0x000004C1	ERROR_INVALID_MESSAGENAME	The format of the specified message name is invalid.
1218	0x000004C2	ERROR_INVALID_MESSAGEDEST	The format of the specified message destination is invalid.
1219	0x000004C3	ERROR_SESSION_CREDENTIAL_CONFLICT	The credentials supplied conflict with an existing set of credentials.
1220	0x000004C4	ERROR_REMOTE_SESSION_LIMIT_EXCEEDED	An attempt was made to establish a session to a network server, but there are already too many sessions established to that server.
1221	0x000004C5	ERROR_DUP_DOMAINNAME	The workgroup or domain name is already in use by another computer on the network.
1222	0x000004C6	ERROR_NO_NETWORK	The network is not present or not started.
1223	0x000004C7	ERROR_CANCELLED	The operation was canceled by the user.
1224	0x000004C8	ERROR_USER_MAPPED_FILE	The requested operation cannot be performed on a file with a user-mapped section open.
1225	0x000004C9	ERROR_CONNECTION_REFUSED	The remote system refused the network connection.
1226	0x000004CA	ERROR_GRACEFUL_DISCONNECT	The network connection was gracefully closed.
1227	0x000004CB	ERROR_ADDRESS_ALREADY_ASSOCIATED	The network transport endpoint already has an address associated with it.
1228	0x000004CC	ERROR_ADDRESS_NOT_ASSOCIATED	An address has not yet been associated with the network endpoint.
1229	0x000004CD	ERROR_CONNECTION_INVALID	An operation was attempted on a nonexistent network connection.
1230	0x000004CE	ERROR_CONNECTION_ACTIVE	An invalid operation was attempted on an active network connection.
1231	0x000004CF	ERROR_NETWORK_UNREACHABLE	The network location cannot be reached. For information about network troubleshooting, see Windows Help.
1232	0x000004D0	ERROR_HOST_UNREACHABLE	The network location cannot be reached. For information about network troubleshooting, see Windows Help.
1233	0x000004D1	ERROR_PROTOCOL_UNREACHABLE	The network location cannot be reached. For information about network troubleshooting, see Windows Help.
1234	0x000004D2	ERROR_PORT_UNREACHABLE	No service is operating at the destination network endpoint on the remote system.
1235	0x000004D3	ERROR_REQUEST_ABORTED	The request was aborted.
1236	0x000004D4	ERROR_CONNECTION_ABORTED	The network connection was aborted by the local system.

Error			Description
decimal	Hexadecimal	Name	
1237	0x000004D5	ERROR_RETRY	The operation could not be completed. A retry should be performed.
1238	0x000004D6	ERROR_CONNECTION_COUNT_LIMIT	A connection to the server could not be made because the limit on the number of concurrent connections for this account has been reached.
1239	0x000004D7	ERROR_LOGIN_TIME_RESTRICTION	Attempting to log in during an unauthorized time of day for this account.
1240	0x000004D8	ERROR_LOGIN_WKSTA_RESTRICTION	The account is not authorized to log in from this station.
1241	0x000004D9	ERROR_INCORRECT_ADDRESS	The network address could not be used for the operation requested.
1242	0x000004DA	ERROR_ALREADY_REGISTERED	The service is already registered.
1243	0x000004DB	ERROR_SERVICE_NOT_FOUND	The specified service does not exist.
1244	0x000004DC	ERROR_NOT_AUTHENTICATED	The operation being requested was not performed because the user has not been authenticated.
1245	0x000004DD	ERROR_NOT_LOGGED_ON	The operation being requested was not performed because the user has not logged on to the network. The specified service does not exist.
1246	0x000004DE	ERROR_CONTINUE	Continue with work in progress.
1247	0x000004DF	ERROR_ALREADY_INITIALIZED	An attempt was made to perform an initialization operation when initialization has already been completed.
1248	0x000004E0	ERROR_NO_MORE_DEVICES	No more local devices.
1249	0x000004E1	ERROR_NO_SUCH_SITE	The specified site does not exist.
1250	0x000004E2	ERROR_DOMAIN_CONTROLLER_EXISTS	A domain controller with the specified name already exists.
1251	0x000004E3	ERROR_ONLY_IF_CONNECTED	This operation is supported only when you are connected to the server.
1252	0x000004E4	ERROR_OVERRIDE_NOCHANGES	The group policy framework should call the extension even if there are no changes.
1253	0x000004E5	ERROR_BAD_USER_PROFILE	The specified user does not have a valid profile.
1254	0x000004E6	ERROR_NOT_SUPPORTED_ON_SBS	This operation is not supported on a Microsoft Small Business Server.
1255	0x000004E7	ERROR_SERVER_SHUTDOWN_IN_PROGRESS	The server machine is shutting down.
1256	0x000004E8	ERROR_HOST_DOWN	The remote system is not available. For information about network troubleshooting, see Windows Help.
1257	0x000004E9	ERROR_NON_ACCOUNT_SID	The security identifier provided is not from an account domain.
1258	0x000004EA	ERROR_NON_DOMAIN_SID	The security identifier provided does not have a domain component.
1259	0x000004EB	ERROR_APPHELP_BLOCK	AppHelp dialog canceled thus preventing the application from starting.
1260	0x000004EC	ERROR_ACCESS_DISABLED_BY_POLICY	Access to the requested resource has been disabled by your administrator.
1261	0x000004ED	ERROR_REG_NAT_CONSUMPTION	A program attempt to use an invalid register value. Normally caused by an uninitialized register. This error is Itanium specific.
1262	0x000004EE	ERROR_CSCSHARE_OFFLINE	The share is currently offline or does not exist.
1300	0x00000514	ERROR_NOT_ALL_ASSIGNED	Not all privileges referenced are assigned to the caller.
1301	0x00000515	ERROR_SOME_NOT_MAPPED	Some mapping between account names and security IDs was not done.
1302	0x00000516	ERROR_NO_QUOTAS_FOR_ACCOUNT	No system quota limits are specifically set for this account.
1303	0x00000517	ERROR_LOCAL_USER_SESSION_KEY	No encryption key is available. A well-known encryption key was returned.
1304	0x00000518	ERROR_NULL_LM_PASSWORD	The password is too complex to be converted to a LAN Manager password. The LAN Manager password returned is a NULL string.
1305	0x00000519	ERROR_UNKNOWN_REVISION	The revision level is unknown.
1306	0x0000051A	ERROR_REVISION_MISMATCH	Indicates two revision levels are incompatible.
1307	0x0000051B	ERROR_INVALID_OWNER	This security ID may not be assigned as the owner of this object.

Error			Description
decimal	Hexadecimal	Name	
1308	0x0000051C	ERROR_INVALID_PRIMARY_GROUP	This security ID may not be assigned as the primary group of an object.
1309	0x0000051D	ERROR_NO_IMPERSONATION_TOKEN	An attempt has been made to operate on an impersonation token by a thread that is not currently impersonating a client.
1310	0x0000051E	ERROR_CANT_DISABLE_MANDATORY	The group may not be disabled.
1311	0x0000051F	ERROR_NO_LOGON_SERVERS	There are currently no logon servers available to service the logon request.
1312	0x00000520	ERROR_NO_SUCH_LOGON_SESSION	A specified logon session does not exist. It may already have been terminated.
1313	0x00000521	ERROR_NO_SUCH_PRIVILEGE	A specified privilege does not exist.
1314	0x00000522	ERROR_PRIVILEGE_NOT_HELD	A required privilege is not held by the client.
1315	0x00000523	ERROR_INVALID_ACCOUNT_NAME	The name provided is not a properly formed account name.
1316	0x00000524	ERROR_USER_EXISTS	The specified user already exists.
1317	0x00000525	ERROR_NO_SUCH_USER	The specified user does not exist.
1318	0x00000526	ERROR_GROUP_EXISTS	The specified group already exists.
1319	0x00000527	ERROR_NO_SUCH_GROUP	The specified group does not exist.
1320	0x00000528	ERROR_MEMBER_IN_GROUP	Either the specified user account is already a member of the specified group, or the specified group cannot be deleted because it contains a member.
1321	0x00000529	ERROR_MEMBER_NOT_IN_GROUP	The specified user account is not a member of the specified group account.
1322	0x0000052A	ERROR_LAST_ADMIN	The last remaining administration account cannot be disabled or deleted.
1323	0x0000052B	ERROR_WRONG_PASSWORD	Unable to update the password. The value provided as the current password is incorrect.
1324	0x0000052C	ERROR_ILL_FORMED_PASSWORD	Unable to update the password. The value provided for the new password contains values that are not allowed in passwords.
1325	0x0000052D	ERROR_PASSWORD_RESTRICTION	Unable to update the password. The value provided for the new password does not meet the length, complexity, or history requirement of the domain.
1326	0x0000052E	ERROR_LOGON_FAILURE	Logon failure: unknown user name or bad password.
1327	0x0000052F	ERROR_ACCOUNT_RESTRICTION	Logon failure: user account restriction.
1328	0x00000530	ERROR_INVALID_LOGON_HOURS	Logon failure: account logon time restriction violation.
1329	0x00000531	ERROR_INVALID_WORKSTATION	Logon failure: user not allowed to log on to this computer.
1330	0x00000532	ERROR_PASSWORD_EXPIRED	Logon failure: the specified account password has expired.
1331	0x00000533	ERROR_ACCOUNT_DISABLED	Logon failure: account currently disabled.
1332	0x00000534	ERROR_NONE_MAPPED	No mapping between account names and security IDs was done.
1333	0x00000535	ERROR_TOO_MANY_LUIDS_REQUESTED	Too many local user identifiers (LUIDs) were requested at one time.
1334	0x00000536	ERROR_LUIDS_EXHAUSTED	No more local user identifiers (LUIDs) are available.
1335	0x00000537	ERROR_INVALID_SUB_AUTHORITY	The subauthority part of a security ID is invalid for this particular use.
1336	0x00000538	ERROR_INVALID_ACL	The access control list (ACL) structure is invalid.
1337	0x00000539	ERROR_INVALID_SID	The security ID structure is invalid.
1338	0x0000053A	ERROR_INVALID_SECURITY_DESCR	The security descriptor structure is invalid.
1340	0x0000053C	ERROR_BAD_INHERITANCE_ACL	The inherited access control list (ACL) or access control entry (ACE) could not be built.
1341	0x0000053D	ERROR_SERVER_DISABLED	The server is currently disabled.
1342	0x0000053E	ERROR_SERVER_NOT_DISABLED	The server is currently enabled.
1343	0x0000053F	ERROR_INVALID_ID_AUTHORITY	The value provided was an invalid value for an identifier authority.
1344	0x00000540	ERROR_ALLOTTED_SPACE_EXCEEDED	No more memory is available for security information updates.

Error			Description
decimal	Hexadecimal	Name	
1345	0x00000541	ERROR_INVALID_GROUP_ATTRIBUTES	The specified attributes are invalid, or incompatible with the attributes for the group as a whole.
1346	0x00000542	ERROR_BAD_IMPERSONATION_LEVEL	Either a required impersonation level was not provided, or the provided impersonation level is invalid.
1347	0x00000543	ERROR_CANT_OPEN_ANONYMOUS	Cannot open an anonymous level security token.
1348	0x00000544	ERROR_BAD_VALIDATION_CLASS	The validation information class requested was invalid.
1349	0x00000545	ERROR_BAD_TOKEN_TYPE	The type of the token is inappropriate for its attempted use.
1350	0x00000546	ERROR_NO_SECURITY_ON_OBJECT	Unable to perform a security operation on an object that has no associated security.
1351	0x00000547	ERROR_CANT_ACCESS_DOMAIN_INFO	Configuration information could not be read from the domain controller, either because the machine is unavailable, or access has been denied.
1352	0x00000548	ERROR_INVALID_SERVER_STATE	The security account manager (SAM) or local security authority (LSA) server was in the wrong state to perform the security operation.
1353	0x00000549	ERROR_INVALID_DOMAIN_STATE	The domain was in the wrong state to perform the security operation.
1354	0x0000054A	ERROR_INVALID_DOMAIN_ROLE	This operation is only allowed for the Primary Domain Controller of the domain.
1355	0x0000054B	ERROR_NO_SUCH_DOMAIN	The specified domain either does not exist or could not be contacted.
1356	0x0000054C	ERROR_DOMAIN_EXISTS	The specified domain already exists.
1357	0x0000054D	ERROR_DOMAIN_LIMIT_EXCEEDED	An attempt was made to exceed the limit on the number of domains per server.
1358	0x0000054E	ERROR_INTERNAL_DB_CORRUPTION	Unable to complete the requested operation because of either a catastrophic media failure or a data structure corruption on the disk.
1359	0x0000054F	ERROR_INTERNAL_ERROR	An internal error occurred.
1360	0x00000550	ERROR_GENERIC_NOT_MAPPED	Generic access types were contained in an access mask which should already be mapped to nongeneric types.
1361	0x00000551	ERROR_BAD_DESCRIPTOR_FORMAT	A security descriptor is not in the right format (absolute or self-relative).
1362	0x00000552	ERROR_NOT_LOGON_PROCESS	The requested action is restricted for use by logon processes only. The calling process has not registered as a logon process.
1363	0x00000553	ERROR_LOGON_SESSION_EXISTS	Cannot start a new logon session with an ID that is already in use.
1364	0x00000554	ERROR_NO_SUCH_PACKAGE	A specified authentication package is unknown.
1365	0x00000555	ERROR_BAD_LOGON_SESSION_STATE	The logon session is not in a state that is consistent with the requested operation.
1366	0x00000556	ERROR_LOGON_SESSION_COLLISION	The logon session ID is already in use.
1367	0x00000557	ERROR_INVALID_LOGON_TYPE	A logon request contained an invalid logon type value.
1368	0x00000558	ERROR_CANNOT_IMPERSONATE	Unable to impersonate using a named pipe until data has been read from that pipe.
1369	0x00000559	ERROR_RXACT_INVALID_STATE	The transaction state of a registry subtree is incompatible with the requested operation.
1370	0x0000055A	ERROR_RXACT_COMMIT_FAILURE	An internal security database corruption has been encountered.
1371	0x0000055B	ERROR_SPECIAL_ACCOUNT	Cannot perform this operation on built-in accounts.
1372	0x0000055C	ERROR_SPECIAL_GROUP	Cannot perform this operation on this built-in special group.
1373	0x0000055D	ERROR_SPECIAL_USER	Cannot perform this operation on this built-in special user.
1374	0x0000055E	ERROR_MEMBERS_PRIMARY_GROUP	The user cannot be removed from a group because the group is currently the user's primary group.
1375	0x0000055F	ERROR_TOKEN_ALREADY_IN_USE	The token is already in use as a primary token.
1376	0x00000560	ERROR_NO_SUCH_ALIAS	The specified local group does not exist.

Error			Description
decimal	Hexadecimal	Name	
1377	0x00000561	ERROR_MEMBER_NOT_IN_ALIAS	The specified account name is not a member of the local group.
1378	0x00000562	ERROR_MEMBER_IN_ALIAS	The specified account name is already a member of the local group.
1379	0x00000563	ERROR_ALIAS_EXISTS	The specified local group already exists.
1380	0x00000564	ERROR_LOGON_NOT_GRANTED	Logon failure: the user has not been granted the requested logon type at this computer.
1381	0x00000565	ERROR_TOO_MANY_SECRETS	The maximum number of secrets that may be stored in a single system has been exceeded.
1382	0x00000566	ERROR_SECRET_TOO_LONG	The length of a secret exceeds the maximum length allowed.
1383	0x00000567	ERROR_INTERNAL_DB_ERROR	The local security authority database contains an internal inconsistency.
1384	0x00000568	ERROR_TOO_MANY_CONTEXT_IDS	During a logon attempt, the user's security context accumulated too many security IDs.
1385	0x00000569	ERROR_LOGON_TYPE_NOT_GRANTED	Logon failure: the user has not been granted the requested logon type at this computer.
1386	0x0000056A	ERROR_NT_CROSS_ENCRYPTION_REQUIRED	A cross-encrypted password is necessary to change a user password.
1387	0x0000056B	ERROR_NO_SUCH_MEMBER	A new member could not be added to or removed from the local group because the member does not exist.
1388	0x0000056C	ERROR_INVALID_MEMBER	A new member could not be added to a local group because the member has the wrong account type.
1389	0x0000056D	ERROR_TOO_MANY_SIDS	Too many security IDs have been specified.
1390	0x0000056E	ERROR_LM_CROSS_ENCRYPTION_REQUIRED	A cross-encrypted password is necessary to change this user password.
1391	0x0000056F	ERROR_NO_INHERITANCE	Indicates an ACL contains no inheritable components.
1392	0x00000570	ERROR_FILE_CORRUPT	The file or directory is corrupted and unreadable.
1393	0x00000571	ERROR_DISK_CORRUPT	The disk structure is corrupted and unreadable.
1394	0x00000572	ERROR_NO_USER_SESSION_KEY	There is no user session key for the specified logon session.
1395	0x00000573	ERROR_LICENSE_QUOTA_EXCEEDED	The service being accessed is licensed for a particular number of connections. No more connections can be made to the service at this time because there are already as many connections as the service can accept.
1396	0x00000574	ERROR_WRONG_TARGET_NAME	Logon Failure: The target account name is incorrect.
1397	0x00000575	ERROR_MUTUAL_AUTH_FAILED	Mutual Authentication failed. The server's password is out of date at the domain controller.
1398	0x00000576	ERROR_TIME_SKEW	There is a time difference between the client and server.
1399	0x00000577	ERROR_CURRENT_DOMAIN_NOT_ALLOWED	This operation can not be performed on the current domain.

Error			Description
decimal	Hexadecimal	Name	
1400	0x00000578	ERROR_INVALID_WINDOW_HANDLE	Invalid window handle.
1401	0x00000579	ERROR_INVALID_MENU_HANDLE	Invalid menu handle.
1402	0x0000057A	ERROR_INVALID_CURSOR_HANDLE	Invalid cursor handle.
1403	0x0000057B	ERROR_INVALID_ACCEL_HANDLE	Invalid accelerator table handle.
1404	0x0000057C	ERROR_INVALID_HOOK_HANDLE	Invalid hook handle.
1405	0x0000057D	ERROR_INVALID_DWP_HANDLE	Invalid handle to a multiple-window position structure.
1406	0x0000057E	ERROR_TLW_WITH_WSCHILD	Cannot create a top-level child window.
1407	0x0000057F	ERROR_CANNOT_FIND_WND_CLASS	Cannot find window class.
1408	0x00000580	ERROR_WINDOW_OF_OTHER_THREAD	Invalid window; it belongs to other thread.
1409	0x00000581	ERROR_HOTKEY_ALREADY_REGISTERED	Hot key is already registered.
1410	0x00000582	ERROR_CLASS_ALREADY_EXISTS	Class already exists.
1411	0x00000583	ERROR_CLASS_DOES_NOT_EXIST	Class does not exist.
1412	0x00000584	ERROR_CLASS_HAS_WINDOWS	Class still has open windows.
1413	0x00000585	ERROR_INVALID_INDEX	Invalid index.
1414	0x00000586	ERROR_INVALID_ICON_HANDLE	Invalid icon handle.
1415	0x00000587	ERROR_PRIVATE_DIALOG_INDEX	Using private DIALOG window words.
1416	0x00000588	ERROR_LISTBOX_ID_NOT_FOUND	The list box identifier was not found.
1417	0x00000589	ERROR_NO_WILDCARD_CHARACTERS	No wildcards were found.
1418	0x0000058A	ERROR_CLIPBOARD_NOT_OPEN	Thread does not have a clipboard open.
1419	0x0000058B	ERROR_HOTKEY_NOT_REGISTERED	Hot key is not registered.
1420	0x0000058C	ERROR_WINDOW_NOT_DIALOG	The window is not a valid dialog window.
1421	0x0000058D	ERROR_CONTROL_ID_NOT_FOUND	Control ID not found.
1422	0x0000058E	ERROR_INVALID_COMBOBOX_MESSAGE	Invalid message for a combo box because it does not have an edit control.
1423	0x0000058F	ERROR_WINDOW_NOT_COMBOBOX	The window is not a combo box.
1424	0x00000590	ERROR_INVALID_EDIT_HEIGHT	Height must be less than 256.
1425	0x00000591	ERROR_DC_NOT_FOUND	Invalid device context (DC) handle.
1426	0x00000592	ERROR_INVALID_HOOK_FILTER	Invalid hook procedure type.
1427	0x00000593	ERROR_INVALID_FILTER_PROC	Invalid hook procedure.
1428	0x00000594	ERROR_HOOK_NEEDS_HMOD	Cannot set nonlocal hook without a module handle.
1429	0x00000595	ERROR_GLOBAL_ONLY_HOOK	This hook procedure can only be set globally.
1430	0x00000596	ERROR_JOURNAL_HOOK_SET	The journal hook procedure is already installed.
1431	0x00000597	ERROR_HOOK_NOT_INSTALLED	The hook procedure is not installed.
1432	0x00000598	ERROR_INVALID_LB_MESSAGE	Invalid message for single-selection list box.
1433	0x00000599	ERROR_SETCOUNT_ON_BAD_LB	LB_SETCOUNT sent to non-lazy list box.
1434	0x0000059A	ERROR_LB_WITHOUT_TABSTOPS	This list box does not support tab stops.
1435	0x0000059B	ERROR_DESTROY_OBJECT_OF_OTHER_THREAD	Cannot destroy object created by another thread.
1436	0x0000059C	ERROR_CHILD_WINDOW_MENU	Child windows cannot have menus.
1437	0x0000059D	ERROR_NO_SYSTEM_MENU	The window does not have a system menu.
1438	0x0000059E	ERROR_INVALID_MSGBOX_STYLE	Invalid message box style.
1439	0x0000059F	ERROR_INVALID_SPI_VALUE	Invalid system-wide (SPI_*) parameter.
1440	0x000005A0	ERROR_SCREEN_ALREADY_LOCKED	Screen already locked.
1441	0x000005A1	ERROR_HWNDS_HAVE_DIFF_PARENT	All handles to windows in a multiple-window position structure must have the same parent.
1442	0x000005A2	ERROR_NOT_CHILD_WINDOW	The window is not a child window.
1443	0x000005A3	ERROR_INVALID_GW_COMMAND	Invalid GW_* command.
1444	0x000005A4	ERROR_INVALID_THREAD_ID	Invalid thread identifier.
1445	0x000005A5	ERROR_NON_MDICHILD_WINDOW	Cannot process a message from a window that is not a multiple document interface (MDI) window.
1446	0x000005A6	ERROR_POPUP_ALREADY_ACTIVE	Popup menu already active.
1447	0x000005A7	ERROR_NO_SCROLLBARS	The window does not have scroll bars.
1448	0x000005A8	ERROR_INVALID_SCROLLBAR_RANGE	Scroll bar range cannot be greater than MAXLONG.
1449	0x000005A9	ERROR_INVALID_SHOWWIN_COMMAND	Cannot show or remove the window in the way specified.

Error			Description
decimal	Hexadecimal	Name	
1450	0x000005AA	ERROR_NO_SYSTEM_RESOURCES	Insufficient system resources exist to complete the requested service.
1451	0x000005AB	ERROR_NONPAGED_SYSTEM_RESOURCES	Insufficient system resources exist to complete the requested service.
1452	0x000005AC	ERROR_PAGED_SYSTEM_RESOURCES	Insufficient system resources exist to complete the requested service.
1453	0x000005AD	ERROR_WORKING_SET_QUOTA	Insufficient quota to complete the requested service.
1454	0x000005AE	ERROR_PAGEFILE_QUOTA	Insufficient quota to complete the requested service.
1455	0x000005AF	ERROR_COMMITMENT_LIMIT	The paging file is too small for this operation to complete.
1456	0x000005B0	ERROR_MENU_ITEM_NOT_FOUND	A menu item was not found.
1457	0x000005B1	ERROR_INVALID_KEYBOARD_HANDLE	Invalid keyboard layout handle.
1458	0x000005B2	ERROR_HOOK_TYPE_NOT_ALLOWED	Hook type not allowed.
1459	0x000005B3	ERROR_REQUIRES_INTERACTIVE_WINDOWSTATION	This operation requires an interactive window station.
1460	0x000005B4	ERROR_TIMEOUT	This operation returned because the timeout period expired.
1461	0x000005B5	ERROR_INVALID_MONITOR_HANDLE	Invalid monitor handle.
1500	0x000005DC	ERROR_EVENTLOG_FILE_CORRUPT	The event log file is corrupted.
1501	0x000005DD	ERROR_EVENTLOG_CANT_START	No event log file could be opened, so the event logging service did not start.
1502	0x000005DE	ERROR_LOG_FILE_FULL	The event log file is full.
1503	0x000005DF	ERROR_EVENTLOG_FILE_CHANGED	The event log file has changed between read operations.

Error			Description
decimal	Hexadecimal	Name	
1601	0x00000641	ERROR_INSTALL_SERVICE_FAILURE	The Windows Installer service could not be accessed. Contact your support personnel to verify that the Windows Installer service is properly registered.
1602	0x00000642	ERROR_INSTALL_USEREXIT	User cancelled installation.
1603	0x00000643	ERROR_INSTALL_FAILURE	Fatal error during installation.
1604	0x00000644	ERROR_INSTALL_SUSPEND	Installation suspended, incomplete.
1605	0x00000645	ERROR_UNKNOWN_PRODUCT	This action is only valid for products that are currently installed.
1606	0x00000646	ERROR_UNKNOWN_FEATURE	Feature ID not registered.
1607	0x00000647	ERROR_UNKNOWN_COMPONENT	Component ID not registered.
1608	0x00000648	ERROR_UNKNOWN_PROPERTY	Unknown property.
1609	0x00000649	ERROR_INVALID_HANDLE_STATE	Handle is in an invalid state.
1610	0x0000064A	ERROR_BAD_CONFIGURATION	The configuration data for this product is corrupt. Contact your support personnel.
1611	0x0000064B	ERROR_INDEX_ABSENT	Component qualifier not present.
1612	0x0000064C	ERROR_INSTALL_SOURCE_ABSENT	The installation source for this product is not available. Verify that the source exists and that you can access it.
1613	0x0000064D	ERROR_INSTALL_PACKAGE_VERSION	This installation package cannot be installed by the Windows Installer service. You must install a Windows service pack that contains a newer version of the Windows Installer service.
1614	0x0000064E	ERROR_PRODUCT_UNINSTALLED	Product is uninstalled.
1615	0x0000064F	ERROR_BAD_QUERY_SYNTAX	SQL query syntax invalid or unsupported.
1616	0x00000650	ERROR_INVALID_FIELD	Record field does not exist.
1617	0x00000651	ERROR_DEVICE_REMOVED	The device has been removed.
1618	0x00000652	ERROR_INSTALL_ALREADY_RUNNING	Another installation is already in progress. Complete that installation before proceeding with this install.
1619	0x00000653	ERROR_INSTALL_PACKAGE_OPEN_FAILED	This installation package could not be opened. Verify that the package exists and that you can access it, or contact the application vendor to verify that this is a valid Windows Installer package.
1620	0x00000654	ERROR_INSTALL_PACKAGE_INVALID	This installation package could not be opened. Contact the application vendor to verify that this is a valid Windows Installer package.
1621	0x00000655	ERROR_INSTALL_UI_FAILURE	There was an error starting the Windows Installer service user interface. Contact your support personnel.
1622	0x00000656	ERROR_INSTALL_LOG_FAILURE	Error opening installation log file. Verify that the specified log file location exists and that you can write to it.
1623	0x00000657	ERROR_INSTALL_LANGUAGE_UNSUPPORTED	The language of this installation package is not supported by your system.
1624	0x00000658	ERROR_INSTALL_TRANSFORM_FAILURE	Error applying transforms. Verify that the specified transform paths are valid.
1625	0x00000659	ERROR_INSTALL_PACKAGE_REJECTED	This installation is forbidden by system policy. Contact your system administrator.
1626	0x0000065A	ERROR_FUNCTION_NOT_CALLED	Function could not be executed.
1627	0x0000065B	ERROR_FUNCTION_FAILED	Function failed during execution.
1628	0x0000065C	ERROR_INVALID_TABLE	Invalid or unknown table specified.
1629	0x0000065D	ERROR_DATATYPE_MISMATCH	Data supplied is of wrong type.
1630	0x0000065E	ERROR_UNSUPPORTED_TYPE	Data of this type is not supported.
1631	0x0000065F	ERROR_CREATE_FAILED	The Windows Installer service failed to start. Contact your support personnel.
1632	0x00000660	ERROR_INSTALL_TEMP_UNWRITABLE	The temp folder is either full or inaccessible. Verify that the temp folder exists and that you can write to it.
1633	0x00000661	ERROR_INSTALL_PLATFORM_UNSUPPORTED	This installation package is not supported by this processor type. Contact your product vendor.
1634	0x00000662	ERROR_INSTALL_NOTUSED	Component not used on this computer.

Error			Description
decimal	Hexadecimal	Name	
1635	0x00000663	ERROR_PATCH_PACKAGE_OPEN_FAILED	This patch package could not be opened. Verify that the patch package exists and that you can access it, or contact the application vendor to verify that this is a valid Windows Installer patch package.
1636	0x00000664	ERROR_PATCH_PACKAGE_INVALID	This patch package could not be opened. Contact the application vendor to verify that this is a valid Windows Installer patch package.
1637	0x00000665	ERROR_PATCH_PACKAGE_UNSUPPORTED.	This patch package cannot be processed by the Windows Installer service. You must install a Windows service pack that contains a newer version of the Windows Installer service.
1638	0x00000666	ERROR_PRODUCT_VERSION	Another version of this product is already installed. Installation of this version cannot continue. To configure or remove the existing version of this product, use Add/Remove Programs on the Control Panel.
1639	0x00000667	ERROR_INVALID_COMMAND_LINE	Invalid command line argument. Consult the Windows Installer SDK for detailed command line help.
1640	0x00000668	ERROR_INSTALL_REMOTE_DISALLOWED	Only administrators have permission to add, remove, or configure server software during a Terminal Services remote session. If you want to install or configure software on the server, contact your network administrator.
1641	0x00000669	ERROR_SUCCESS_REBOOT_INITIATED	The requested operation completed successfully. The system will be restarted so the changes can take effect.
1642	0x0000066A	ERROR_PATCH_TARGET_NOT_FOUND	The upgrade patch cannot be installed by the Windows Installer service because the program to be upgraded may be missing, or the upgrade patch may update a different version of the program. Verify that the program to be upgraded exists on your computer and that you have the correct upgrade patch.
1643	0x0000066B	ERROR_PATCH_PACKAGE_REJECTED	The patch package is not permitted by system policy. It is not signed with an appropriate certificate.
1644	0x0000066C	ERROR_INSTALL_TRANSFORM_REJECTED	One or more customizations are not permitted by system policy. They are not signed with an appropriate certificate.
1700	0x000006A4	RPC_S_INVALID_STRING_BINDING	The string binding is invalid.
1701	0x000006A5	RPC_S_WRONG_KIND_OF_BINDING	The binding handle is not the correct type.
1702	0x000006A6	RPC_S_INVALID_BINDING	The binding handle is invalid.
1703	0x000006A7	RPC_S_PROTSEQ_NOT_SUPPORTED	The RPC protocol sequence is not supported.
1704	0x000006A8	RPC_S_INVALID_RPC_PROTSEQ	The RPC protocol sequence is invalid.
1705	0x000006A9	RPC_S_INVALID_STRING_UUID	The string universal unique identifier (UUID) is invalid.
1706	0x000006AA	RPC_S_INVALID_ENDPOINT_FORMAT	The endpoint format is invalid.
1707	0x000006AB	RPC_S_INVALID_NET_ADDR	The network address is invalid.
1708	0x000006AC	RPC_S_NO_ENDPOINT_FOUND	No endpoint was found.
1709	0x000006AD	RPC_S_INVALID_TIMEOUT	The timeout value is invalid.
1710	0x000006AE	RPC_S_OBJECT_NOT_FOUND	The object universal unique identifier (UUID) was not found.
1711	0x000006AF	RPC_S_ALREADY_REGISTERED	The object universal unique identifier (UUID) has already been registered.
1712	0x000006B0	RPC_S_TYPE_ALREADY_REGISTERED	The type universal unique identifier (UUID) has already been registered.
1713	0x000006B1	RPC_S_ALREADY_LISTENING	The RPC server is already listening.
1714	0x000006B2	RPC_S_NO_PROTSEQS_REGISTERED	No protocol sequences have been registered.
1715	0x000006B3	RPC_S_NOT_LISTENING	The RPC server is not listening.
1716	0x000006B4	RPC_S_UNKNOWN_MGR_TYPE	The manager type is unknown.
1717	0x000006B5	RPC_S_UNKNOWN_IF	The interface is unknown.
1718	0x000006B6	RPC_S_NO_BINDINGS	There are no bindings.
1719	0x000006B7	RPC_S_NO_PROTSEQS	There are no protocol sequences.
1720	0x000006B8	RPC_S_CANT_CREATE_ENDPOINT	The endpoint cannot be created.

Error			Description
decimal	Hexadecimal	Name	
1721	0x000006B9	RPC_S_OUT_OF_RESOURCES	Not enough resources are available to complete this operation.
1722	0x000006BA	RPC_S_SERVER_UNAVAILABLE	The RPC server is unavailable.
1723	0x000006BB	RPC_S_SERVER_TOO_BUSY	The RPC server is too busy to complete this operation.
1724	0x000006BC	RPC_S_INVALID_NETWORK_OPTIONS	The network options are invalid.
1725	0x000006BD	RPC_S_NO_CALL_ACTIVE	There are no remote procedure calls active on this thread.
1726	0x000006BE	RPC_S_CALL_FAILED	The remote procedure call failed.
1727	0x000006BF	RPC_S_CALL_FAILED_DNE	The remote procedure call failed and did not execute.
1728	0x000006C0	RPC_S_PROTOCOL_ERROR	A remote procedure call (RPC) protocol error occurred.
1730	0x000006C2	RPC_S_UNSUPPORTED_TRANS_SYN	The transfer syntax is not supported by the RPC server.
1732	0x000006C4	RPC_S_UNSUPPORTED_TYPE	The universal unique identifier (UUID) type is not supported.
1733	0x000006C5	RPC_S_INVALID_TAG	The tag is invalid.
1734	0x000006C6	RPC_S_INVALID_BOUND	The array bounds are invalid.
1735	0x000006C7	RPC_S_NO_ENTRY_NAME	The binding does not contain an entry name.
1736	0x000006C8	RPC_S_INVALID_NAME_SYNTAX	The name syntax is invalid.
1737	0x000006C9	RPC_S_UNSUPPORTED_NAME_SYNTAX	The name syntax is not supported.
1739	0x000006CB	RPC_S_UUID_NO_ADDRESS	No network address is available to use to construct a universal unique identifier (UUID).
1740	0x000006CC	RPC_S_DUPLICATE_ENDPOINT	The endpoint is a duplicate.
1741	0x000006CD	RPC_S_UNKNOWN_AUTHN_TYPE	The authentication type is unknown.
1742	0x000006CE	RPC_S_MAX_CALLS_TOO_SMALL	The maximum number of calls is too small.
1743	0x000006CF	RPC_S_STRING_TOO_LONG	The string is too long.
1744	0x000006D0	RPC_S_PROTSEQ_NOT_FOUND	The RPC protocol sequence was not found.
1745	0x000006D1	RPC_S_PROCNUM_OUT_OF_RANGE	The procedure number is out of range.
1746	0x000006D2	RPC_S_BINDING_HAS_NO_AUTH	The binding does not contain any authentication information.
1747	0x000006D3	RPC_S_UNKNOWN_AUTHN_SERVICE	The authentication service is unknown.
1748	0x000006D4	RPC_S_UNKNOWN_AUTHN_LEVEL	The authentication level is unknown.
1749	0x000006D5	RPC_S_INVALID_AUTH_IDENTITY	The security context is invalid.
1750	0x000006D6	RPC_S_UNKNOWN_AUTHZ_SERVICE	The authorization service is unknown.
1751	0x000006D7	EPT_S_INVALID_ENTRY	The entry is invalid.
1752	0x000006D8	EPT_S_CANT_PERFORM_OP	The server endpoint cannot perform the operation.
1753	0x000006D9	EPT_S_NOT_REGISTERED	There are no more endpoints available from the endpoint mapper.
1754	0x000006DA	RPC_S_NOTHING_TO_EXPORT	No interfaces have been exported.
1755	0x000006DB	RPC_S_INCOMPLETE_NAME	The entry name is incomplete.
1756	0x000006DC	RPC_S_INVALID_VERS_OPTION	The version option is invalid.
1757	0x000006DD	RPC_S_NO_MORE_MEMBERS	There are no more members.
1758	0x000006DE	RPC_S_NOT_ALL_OBJS_UNEXPORTED	There is nothing to unexport.
1759	0x000006DF	RPC_S_INTERFACE_NOT_FOUND	The interface was not found.
1760	0x000006E0	RPC_S_ENTRY_ALREADY_EXISTS	The entry already exists.
1761	0x000006E1	RPC_S_ENTRY_NOT_FOUND	The entry is not found.
1762	0x000006E2	RPC_S_NAME_SERVICE_UNAVAILABLE	The name service is unavailable.
1763	0x000006E3	RPC_S_INVALID_NAF_ID	The network address family is invalid.
1764	0x000006E4	RPC_S_CANNOT_SUPPORT	The requested operation is not supported.
1765	0x000006E5	RPC_S_NO_CONTEXT_AVAILABLE	No security context is available to allow impersonation.
1766	0x000006E6	RPC_S_INTERNAL_ERROR	An internal error occurred in a remote procedure call (RPC).
1767	0x000006E7	RPC_S_ZERO_DIVIDE	The RPC server attempted an integer division by zero.
1768	0x000006E8	RPC_S_ADDRESS_ERROR	An addressing error occurred in the RPC server.
1769	0x000006E9	RPC_S_FP_DIV_ZERO	A floating-point operation at the RPC server caused a division by zero.

Error			Description
decimal	Hexadecimal	Name	
1770	0x000006EA	RPC_S_FP_UNDERFLOW	A floating-point underflow occurred at the RPC server.
1771	0x000006EB	RPC_S_FP_OVERFLOW	A floating-point overflow occurred at the RPC server.
1772	0x000006EC	RPC_X_NO_MORE_ENTRIES	The list of RPC servers available for the binding of auto handles has been exhausted.
1773	0x000006ED	RPC_X_SS_CHAR_TRANS_OPEN_FAIL	Unable to open the character translation table file.
1774	0x000006EE	RPC_X_SS_CHAR_TRANS_SHORT_FILE	The file containing the character translation table has fewer than 512 bytes.
1775	0x000006EF	RPC_X_SS_IN_NULL_CONTEXT	A null context handle was passed from the client to the host during a remote procedure call.
1777	0x000006F1	RPC_X_SS_CONTEXT_DAMAGED	The context handle changed during a remote procedure call.
1778	0x000006F2	RPC_X_SS_HANDLES_MISMATCH	The binding handles passed to a remote procedure call do not match.
1779	0x000006F3	RPC_X_SS_CANNOT_GET_CALL_HANDLE	The stub is unable to get the remote procedure call handle.
1780	0x000006F4	RPC_X_NULL_REF_POINTER	A null reference pointer was passed to the stub.
1781	0x000006F5	RPC_X_ENUM_VALUE_OUT_OF_RANGE	The enumeration value is out of range.
1782	0x000006F6	RPC_X_BYTE_COUNT_TOO_SMALL	The byte count is too small.
1783	0x000006F7	RPC_X_BAD_STUB_DATA	The stub received bad data.
1784	0x000006F8	ERROR_INVALID_USER_BUFFER	The supplied user buffer is not valid for the requested operation.
1785	0x000006F9	ERROR_UNRECOGNIZED_MEDIA	The disk media is not recognized. It may not be formatted.
1786	0x000006FA	ERROR_NO_TRUST_LSA_SECRET	The workstation does not have a trust secret.
1787	0x000006FB	ERROR_NO_TRUST_SAM_ACCOUNT	The security database on the server does not have a computer account for this workstation trust relationship.
1788	0x000006FC	ERROR_TRUSTED_DOMAIN_FAILURE	The trust relationship between the primary domain and the trusted domain failed.
1789	0x000006FD	ERROR_TRUSTED_RELATIONSHIP_FAILURE	The trust relationship between this workstation and the primary domain failed.
1790	0x000006FE	ERROR_TRUST_FAILURE	The network logon failed.
1791	0x000006FF	RPC_S_CALL_IN_PROGRESS	A remote procedure call is already in progress for this thread.
1792	0x00000700	ERROR_NETLOGON_NOT_STARTED	An attempt was made to logon, but the network logon service was not started.
1793	0x00000701	ERROR_ACCOUNT_EXPIRED	The user's account has expired.
1794	0x00000702	ERROR_REDIRECTOR_HAS_OPEN_HANDLES	The redirector is in use and cannot be unloaded.
1795	0x00000703	ERROR_PRINTER_DRIVER_ALREADY_INSTALLED	The specified printer driver is already installed.
1796	0x00000704	ERROR_UNKNOWN_PORT	The specified port is unknown.
1797	0x00000705	ERROR_UNKNOWN_PRINTER_DRIVER	The printer driver is unknown.
1798	0x00000706	ERROR_UNKNOWN_PRINTPROCESSOR	The print processor is unknown.
1799	0x00000707	ERROR_INVALID_SEPARATOR_FILE	The specified separator file is invalid.

Error			Description
decimal	Hexadecimal	Name	
1800	0x00000708	ERROR_INVALID_PRIORITY	The specified priority is invalid.
1801	0x00000709	ERROR_INVALID_PRINTER_NAME	The printer name is invalid.
1802	0x0000070A	ERROR_PRINTER_ALREADY_EXISTS	The printer already exists.
1803	0x0000070B	ERROR_INVALID_PRINTER_COMMAND	The printer command is invalid.
1804	0x0000070C	ERROR_INVALID_DATATYPE	The specified datatype is invalid.
1805	0x0000070D	ERROR_INVALID_ENVIRONMENT	The environment specified is invalid.
1806	0x0000070E	RPC_S_NO_MORE_BINDINGS	There are no more bindings.
1807	0x0000070F	ERROR_NOLOGON_INTERDOMAIN_TRUST_ACCOUNT	The account used is an interdomain trust account. Use your global user account or local user account to access this server.
1808	0x00000710	ERROR_NOLOGON_WORKSTATION_TRUST_ACCOUNT	The account used is a computer account. Use your global user account or local user account to access this server.
1809	0x00000711	ERROR_NOLOGON_SERVER_TRUST_ACCOUNT	The account used is a server trust account. Use your global user account or local user account to access this server.
1810	0x00000712	ERROR_DOMAIN_TRUST_INCONSISTENT	The name or security ID (SID) of the domain specified is inconsistent with the trust information for that domain.
1811	0x00000713	ERROR_SERVER_HAS_OPEN_HANDLES	The server is in use and cannot be unloaded.
1812	0x00000714	ERROR_RESOURCE_DATA_NOT_FOUND	The specified image file did not contain a resource section.
1813	0x00000715	ERROR_RESOURCE_TYPE_NOT_FOUND	The specified resource type cannot be found in the image file.
1814	0x00000716	ERROR_RESOURCE_NAME_NOT_FOUND	The specified resource name cannot be found in the image file.
1815	0x00000717	ERROR_RESOURCE_LANG_NOT_FOUND	The specified resource language ID cannot be found in the image file.
1816	0x00000718	ERROR_NOT_ENOUGH_QUOTA	Not enough quota is available to process this command.
1817	0x00000719	RPC_S_NO_INTERFACES	No interfaces have been registered.
1818	0x0000071A	RPC_S_CALL_CANCELLED	The remote procedure call was cancelled.
1819	0x0000071B	RPC_S_BINDING_INCOMPLETE	The binding handle does not contain all required information.
1820	0x0000071C	RPC_S_COMM_FAILURE	A communications failure occurred during a remote procedure call.
1821	0x0000071D	RPC_S_UNSUPPORTED_AUTHN_LEVEL	The requested authentication level is not supported.
1822	0x0000071E	RPC_S_NO_PRINC_NAME	No principal name registered.
1823	0x0000071F	RPC_S_NOT_RPC_ERROR	The error specified is not a valid Windows RPC error code.
1824	0x00000720	RPC_S_UUID_LOCAL_ONLY	A UUID that is valid only on this computer has been allocated.
1825	0x00000721	RPC_S_SEC_PKG_ERROR	A security package specific error occurred.
1826	0x00000722	RPC_S_NOT_CANCELLED	Thread is not canceled.
1827	0x00000723	RPC_X_INVALID_ES_ACTION	Invalid operation on the encoding/decoding handle.
1828	0x00000724	RPC_X_WRONG_ES_VERSION	Incompatible version of the serializing package.
1829	0x00000725	RPC_X_WRONG_STUB_VERSION	Incompatible version of the RPC stub.
1830	0x00000726	RPC_X_INVALID_PIPE_OBJECT	The RPC pipe object is invalid or corrupted.
1831	0x00000727	RPC_X_WRONG_PIPE_ORDER	An invalid operation was attempted on an RPC pipe object.
1832	0x00000728	RPC_X_WRONG_PIPE_VERSION	Unsupported RPC pipe version.
1898	0x0000076A	RPC_S_GROUP_MEMBER_NOT_FOUND	The group member was not found.
1899	0x0000076B	EPT_S_CANT_CREATE	The endpoint mapper database entry could not be created.
1900	0x0000076C	RPC_S_INVALID_OBJECT	The object universal unique identifier (UUID) is the nil UUID.
1901	0x0000076D	ERROR_INVALID_TIME	The specified time is invalid.
1902	0x0000076E	ERROR_INVALID_FORM_NAME	The specified form name is invalid.
1903	0x0000076F	ERROR_INVALID_FORM_SIZE	The specified form size is invalid.
1904	0x00000770	ERROR_ALREADY_WAITING	The specified printer handle is already being waited on

Error			Description
decimal	Hexadecimal	Name	
1905	0x00000771	ERROR_PRINTER_DELETED	The specified printer has been deleted.
1906	0x00000772	ERROR_INVALID_PRINTER_STATE	The state of the printer is invalid.
1907	0x00000773	ERROR_PASSWORD_MUST_CHANGE	The user's password must be changed before logging on the first time.
1908	0x00000774	ERROR_DOMAIN_CONTROLLER_NOT_FOUND	Could not find the domain controller for this domain.
1909	0x00000775	ERROR_ACCOUNT_LOCKED_OUT	The referenced account is currently locked out and may not be logged on to.
1910	0x00000776	OR_INVALID_OXID	The object exporter specified was not found.
1911	0x00000777	OR_INVALID_OID	The object specified was not found.
1912	0x00000778	OR_INVALID_SET	The object resolver set specified was not found.
1913	0x00000779	RPC_S_SEND_INCOMPLETE	Some data remains to be sent in the request buffer.
1914	0x0000077A	RPC_S_INVALID_ASYNC_HANDLE	Invalid asynchronous remote procedure call handle.
1915	0x0000077B	RPC_S_INVALID_ASYNC_CALL	Invalid asynchronous RPC call handle for this operation.
1916	0x0000077C	RPC_X_PIPE_CLOSED	The RPC pipe object has already been closed.
1917	0x0000077D	RPC_X_PIPE_DISCIPLINE_ERROR	The RPC call completed before all pipes were processed.
1918	0x0000077E	RPC_X_PIPE_EMPTY	No more data is available from the RPC pipe.
1919	0x0000077F	ERROR_NO_SITENAME	No site name is available for this machine.
1920	0x00000780	ERROR_CANT_ACCESS_FILE	The file can not be accessed by the system.
1921	0x00000781	ERROR_CANT_RESOLVE_FILENAME	The name of the file cannot be resolved by the system.
1922	0x00000782	RPC_S_ENTRY_TYPE_MISMATCH	The entry is not of the expected type.
1923	0x00000783	RPC_S_NOT_ALL_OBJS_EXPORTED	Not all object UUIDs could be exported to the specified entry.
1924	0x00000784	RPC_S_INTERFACE_NOT_EXPORTED	Interface could not be exported to the specified entry.
1925	0x00000785	RPC_S_PROFILE_NOT_ADDED	The specified profile entry could not be added.
1926	0x00000786	RPC_S_PRF_ELT_NOT_ADDED	The specified profile element could not be added.
1927	0x00000787	RPC_S_PRF_ELT_NOT_REMOVED	The specified profile element could not be removed.
1928	0x00000788	RPC_S_GRP_ELT_NOT_ADDED	The group element could not be added.
1929	0x00000789	RPC_S_GRP_ELT_NOT_REMOVED	The group element could not be removed.
1930	0x0000078A	ERROR_KM_DRIVER_BLOCKED	The printer driver is not compatible with a policy enabled on your computer that blocks NT 4.0 drivers.

Error			Description
decimal	Hexadecimal	Name	
2000	0x000007D0	ERROR_INVALID_PIXEL_FORMAT	The pixel format is invalid.
2001	0x000007D1	ERROR_BAD_DRIVER	The specified driver is invalid.
2002	0x000007D2	ERROR_INVALID_WINDOW_STYLE	The window style or class attribute is invalid for this operation.
2003	0x000007D3	ERROR_METAFILE_NOT_SUPPORTED	The requested metafile operation is not supported.
2004	0x000007D4	ERROR_TRANSFORM_NOT_SUPPORTED	The requested transformation operation is not supported.
2005	0x000007D5	ERROR_CLIPPING_NOT_SUPPORTED	The requested clipping operation is not supported.
2010	0x000007DA	ERROR_INVALID_CMM	The specified color management module is invalid.
2011	0x000007DB	ERROR_INVALID_PROFILE	The specified color profile is invalid.
2012	0x000007DC	ERROR_TAG_NOT_FOUND	The specified tag was not found.
2013	0x000007DD	ERROR_TAG_NOT_PRESENT	A required tag is not present.
2014	0x000007DE	ERROR_DUPLICATE_TAG	The specified tag is already present.
2015	0x000007DF	ERROR_PROFILE_NOT_ASSOCIATED_WITH_DEVICE	The specified color profile is not associated with any device.
2016	0x000007E0	ERROR_PROFILE_NOT_FOUND	The specified color profile was not found.
2017	0x000007E1	ERROR_INVALID_COLORSPACE	The specified color space is invalid.
2018	0x000007E2	ERROR_ICM_NOT_ENABLED	Image Color Management is not enabled.
2019	0x000007E3	ERROR_DELETING_ICM_XFORM	There was an error while deleting the color transform.
2020	0x000007E4	ERROR_INVALID_TRANSFORM	The specified color transform is invalid.
2021	0x000007E5	ERROR_COLORSPACE_MISMATCH	The specified transform does not match the bitmap's color space.
2022	0x000007E6	ERROR_INVALID_COLORINDEX	The specified named color index is not present in the profile.
2108	0x0000083C	ERROR_CONNECTED_OTHER_PASSWORD	The network connection was made successfully, but the user had to be prompted for a password other than the one originally specified.
2202	0x0000089A	ERROR_BAD_USERNAME	The specified username is invalid.
2250	0x000008CA	ERROR_NOT_CONNECTED	This network connection does not exist.
2401	0x00000961	ERROR_OPEN_FILES	This network connection has files open or requests pending.
2402	0x00000962	ERROR_ACTIVE_CONNECTIONS	Active connections still exist.
2404	0x00000964	ERROR_DEVICE_IN_USE	The device is in use by an active process and cannot be disconnected.
2500	0x000009C4	ERROR_PKINIT_FAILURE	The kerberos protocol encountered an error while validating the KDC certificate during smartcard logon.
2501	0x000009C5	ERROR_SMARTCARD_SUBSYSTEM_FAILURE	The kerberos protocol encountered an error while attempting to utilize the smartcard subsystem.

Error			Description
decimal	Hexadecimal	Name	
3000	0x00000BB8	ERROR_UNKNOWN_PRINT_MONITOR	The specified print monitor is unknown.
3001	0x00000BB9	ERROR_PRINTER_DRIVER_IN_USE	The specified printer driver is currently in use.
3002	0x00000BBA	ERROR_SPOOL_FILE_NOT_FOUND	The spool file was not found.
3003	0x00000BBB	ERROR_SPL_NO_STARTDOC	A StartDocPrinter call was not issued.
3004	0x00000BBC	ERROR_SPL_NO_ADDJOB	An AddJob call was not issued.
3005	0x00000BBD	ERROR_PRINT_PROCESSOR_ALREADY_INSTALLED	The specified print processor has already been installed.
3006	0x00000BBE	ERROR_PRINT_MONITOR_ALREADY_INSTALLED	The specified print monitor has already been installed.
3007	0x00000BBF	ERROR_INVALID_PRINT_MONITOR	The specified print monitor does not have the required functions.
3008	0x00000BC0	ERROR_PRINT_MONITOR_IN_USE	The specified print monitor is currently in use.
3009	0x00000BC1	ERROR_PRINTER_HAS_JOBS_QUEUED	The requested operation is not allowed when there are jobs queued to the printer.
3010	0x00000BC2	ERROR_SUCCESS_REBOOT_REQUIRED	The requested operation is successful. Changes will not be effective until the system is rebooted.
3011	0x00000BC3	ERROR_SUCCESS_RESTART_REQUIRED	The requested operation is successful. Changes will not be effective until the service is restarted.
3012	0x00000BC4	ERROR_PRINTER_NOT_FOUND	No printers were found.
4000	0x00000FA0	ERROR_WINS_INTERNAL	WINS encountered an error while processing the command.
4001	0x00000FA1	ERROR_CAN_NOT_DEL_LOCAL_WINS	The local WINS can not be deleted.
4002	0x00000FA2	ERROR_STATIC_INIT	The importation from the file failed.
4003	0x00000FA3	ERROR_INC_BACKUP	The backup failed. Was a full backup done before?
4004	0x00000FA4	ERROR_FULL_BACKUP	The backup failed. Check the directory to which you are backing the database.
4005	0x00000FA5	ERROR_REC_NON_EXISTENT	The name does not exist in the WINS database.
4006	0x00000FA6	ERROR_RPL_NOT_ALLOWED	Replication with a nonconfigured partner is not allowed.
4100	0x00001004	ERROR_DHCP_ADDRESS_CONFLICT	The DHCP client has obtained an IP address that is already in use on the network. The local interface will be disabled until the DHCP client can obtain a new address.
4200	0x00001068	ERROR_WMI_GUID_NOT_FOUND	The GUID passed was not recognized as valid by a WMI data provider.
4201	0x00001069	ERROR_WMI_INSTANCE_NOT_FOUND	The instance name passed was not recognized as valid by a WMI data provider.
4202	0x0000106A	ERROR_WMI_ITEMID_NOT_FOUND	The data item ID passed was not recognized as valid by a WMI data provider.
4203	0x0000106B	ERROR_WMI_TRY_AGAIN	The WMI request could not be completed and should be retried.
4204	0x0000106C	ERROR_WMI_DP_NOT_FOUND	The WMI data provider could not be located.
4205	0x0000106D	ERROR_WMI_UNRESOLVED_INSTANCE_REF	The WMI data provider references an instance set that has not been registered.
4206	0x0000106E	ERROR_WMI_ALREADY_ENABLED	The WMI data block or event notification has already been enabled.
4207	0x0000106F	ERROR_WMI_GUID_DISCONNECTED	The WMI data block is no longer available.
4208	0x00001070	ERROR_WMI_SERVER_UNAVAILABLE	The WMI data service is not available.
4209	0x00001071	ERROR_WMI_DP_FAILED	The WMI data provider failed to carry out the request.
4210	0x00001072	ERROR_WMI_INVALID_MOF	The WMI MOF information is not valid.
4211	0x00001073	ERROR_WMI_INVALID_REGINFO	The WMI registration information is not valid.
4212	0x00001074	ERROR_WMI_ALREADY_DISABLED	The WMI data block or event notification has already been disabled.
4213	0x00001075	ERROR_WMI_READ_ONLY	The WMI data item or data block is read only.
4214	0x00001076	ERROR_WMI_SET_FAILURE	The WMI data item or data block could not be changed.
4300	0x000010CC	ERROR_INVALID_MEDIA	The media identifier does not represent a valid medium.
4301	0x000010CD	ERROR_INVALID_LIBRARY	The library identifier does not represent a valid library.

Error			Description
decimal	Hexadecimal	Name	
4302	0x000010CE	ERROR_INVALID_MEDIA_POOL	The media pool identifier does not represent a valid media pool.
4303	0x000010CF	ERROR_DRIVE_MEDIA_MISMATCH	The drive and medium are not compatible or exist in different libraries.
4304	0x000010D0	ERROR_MEDIA_OFFLINE	The medium currently exists in an offline library and must be online to perform this operation.
4305	0x000010D1	ERROR_LIBRARY_OFFLINE	The operation cannot be performed on an offline library.
4306	0x000010D2	ERROR_EMPTY	The library, drive, or media pool is empty.
4307	0x000010D3	ERROR_NOT_EMPTY	The library, drive, or media pool must be empty to perform this operation.
4308	0x000010D4	ERROR_MEDIA_UNAVAILABLE	No media is currently available in this media pool or library.
4309	0x000010D5	ERROR_RESOURCE_DISABLED	A resource required for this operation is disabled.
4310	0x000010D6	ERROR_INVALID_CLEANER	The media identifier does not represent a valid cleaner.
4311	0x000010D7	ERROR_UNABLE_TO_CLEAN	The drive cannot be cleaned or does not support cleaning.
4312	0x000010D8	ERROR_OBJECT_NOT_FOUND	The object identifier does not represent a valid object.
4313	0x000010D9	ERROR_DATABASE_FAILURE	Unable to read from or write to the database.
4314	0x000010DA	ERROR_DATABASE_FULL	The database is full.
4315	0x000010DB	ERROR_MEDIA_INCOMPATIBLE	The medium is not compatible with the device or media pool.
4316	0x000010DC	ERROR_RESOURCE_NOT_PRESENT	The resource required for this operation does not exist.
4317	0x000010DD	ERROR_INVALID_OPERATION	The operation identifier is not valid.
4318	0x000010DE	ERROR_MEDIA_NOT_AVAILABLE	The media is not mounted or ready for use.
4319	0x000010DF	ERROR_DEVICE_NOT_AVAILABLE	The device is not ready for use.
4320	0x000010E0	ERROR_REQUEST_REFUSED	The operator or administrator has refused the request.
4321	0x000010E1	ERROR_INVALID_DRIVE_OBJECT	The drive identifier does not represent a valid drive.
4322	0x000010E2	ERROR_LIBRARY_FULL	Library is full. No slot is available for use.
4323	0x000010E3	ERROR_MEDIUM_NOT_ACCESSIBLE	The transport cannot access the medium.
4324	0x000010E4	ERROR_UNABLE_TO_LOAD_MEDIUM	Unable to load the medium into the drive.
4325	0x000010E5	ERROR_UNABLE_TO_INVENTORY_DRIVE	Unable to retrieve status about the drive.
4326	0x000010E6	ERROR_UNABLE_TO_INVENTORY_SLOT	Unable to retrieve status about the slot.
4327	0x000010E7	ERROR_UNABLE_TO_INVENTORY_TRANSPORT	Unable to retrieve status about the transport.
4328	0x000010E8	ERROR_TRANSPORT_FULL	Cannot use the transport because it is already in use.
4329	0x000010E9	ERROR_CONTROLLING_IEPORT	Unable to open or close the inject/eject port.
4330	0x000010EA	ERROR_UNABLE_TO_EJECT_MOUNTED_MEDIA	Unable to eject the media because it is in a drive.
4331	0x000010EB	ERROR_CLEANER_SLOT_SET	A cleaner slot is already reserved.
4332	0x000010EC	ERROR_CLEANER_SLOT_NOT_SET	A cleaner slot is not reserved.
4333	0x000010ED	ERROR_CLEANER_CARTRIDGE_SPENT	The cleaner cartridge has performed the maximum number of drive cleanings.
4334	0x000010EE	ERROR_UNEXPECTED_OMID	Unexpected on-medium identifier.
4335	0x000010EF	ERROR_CANT_DELETE_LAST_ITEM	The last remaining item in this group or resource cannot be deleted.
4336	0x000010F0	ERROR_MESSAGE_EXCEEDS_MAX_SIZE	The message provided exceeds the maximum size allowed for this parameter.
4337	0x000010F1	ERROR_VOLUME_CONTAINS_SYS_FILES	The volume contains system or paging files.
4338	0x000010F2	ERROR_INDIGENOUS_TYPE	The media type cannot be removed from this library since at least one drive in the library reports it can support this media type.
4339	0x000010F3	ERROR_NO_SUPPORTING_DRIVES	This offline media cannot be mounted on this system since no enabled drives are present which can be used.
4340	0x000010F4	ERROR_CLEANER_CARTRIDGE_INSTALLED	A cleaner cartridge is present in the tape library.
4350	0x000010FE	ERROR_FILE_OFFLINE	The remote storage service was not able to recall the file.

Error			Description
decimal	Hexadecimal	Name	
4351	0x000010FF	ERROR_REMOTE_STORAGE_NOT_ACTIVE	The remote storage service is not operational at this time.
4352	0x00001100	ERROR_REMOTE_STORAGE_MEDIA_ERROR	The remote storage service encountered a media error.
4390	0x00001126	ERROR_NOT_A_REPARSE_POINT	The file or directory is not a reparse point.
4391	0x00001127	ERROR_REPARSE_ATTRIBUTE_CONFLICT	The reparse point attribute cannot be set because it conflicts with an existing attribute.
4392	0x00001128	ERROR_INVALID_REPARSE_DATA	The data present in the reparse point buffer is invalid.
4393	0x00001129	ERROR_REPARSE_TAG_INVALID	The tag present in the reparse point buffer is invalid.
4394	0x0000112A	ERROR_REPARSE_TAG_MISMATCH	There is a mismatch between the tag specified in the request and the tag present in the reparse point.
4500	0x00001194	ERROR_VOLUME_NOT_SIS_ENABLED	Single Instance Storage is not available on this volume.

Error			Description
decimal	Hexadecimal	Name	
5001	0x00001389	ERROR_DEPENDENT_RESOURCE_EXISTS	The cluster resource cannot be moved to another group because other resources are dependent on it.
5002	0x0000138A	ERROR_DEPENDENCY_NOT_FOUND	The cluster resource dependency cannot be found.
5003	0x0000138B	ERROR_DEPENDENCY_ALREADY_EXISTS	The cluster resource cannot be made dependent on the specified resource because it is already dependent.
5004	0x0000138C	ERROR_RESOURCE_NOT_ONLINE	The cluster resource is not online.
5005	0x0000138D	ERROR_HOST_NODE_NOT_AVAILABLE	A cluster node is not available for this operation.
5006	0x0000138E	ERROR_RESOURCE_NOT_AVAILABLE	The cluster resource is not available.
5007	0x0000138F	ERROR_RESOURCE_NOT_FOUND	The cluster resource could not be found.
5008	0x00001390	ERROR_SHUTDOWN_CLUSTER	The cluster is being shut down.
5009	0x00001391	ERROR_CANT_EVICT_ACTIVE_NODE	A cluster node cannot be evicted from the cluster unless the node is down.
5010	0x00001392	ERROR_OBJECT_ALREADY_EXISTS	The object already exists.
5011	0x00001393	ERROR_OBJECT_IN_LIST	The object is already in the list.
5012	0x00001394	ERROR_GROUP_NOT_AVAILABLE	The cluster group is not available for any new requests.
5013	0x00001395	ERROR_GROUP_NOT_FOUND	The cluster group could not be found.
5014	0x00001396	ERROR_GROUP_NOT_ONLINE	The operation could not be completed because the cluster group is not online.
5015	0x00001397	ERROR_HOST_NODE_NOT_RESOURCE_OWNER	The cluster node is not the owner of the resource.
5016	0x00001398	ERROR_HOST_NODE_NOT_GROUP_OWNER	The cluster node is not the owner of the group.
5017	0x00001399	ERROR_RESMON_CREATE_FAILED	The cluster resource could not be created in the specified resource monitor.
5018	0x0000139A	ERROR_RESMON_ONLINE_FAILED	The cluster resource could not be brought online by the resource monitor.
5019	0x0000139B	ERROR_RESOURCE_ONLINE	The operation could not be completed because the cluster resource is online.
5020	0x0000139C	ERROR_QUORUM_RESOURCE	The cluster resource could not be deleted or brought offline because it is the quorum resource.
5021	0x0000139D	ERROR_NOT_QUORUM_CAPABLE	The cluster could not make the specified resource a quorum resource because it is not capable of being a quorum resource.
5022	0x0000139E	ERROR_CLUSTER_SHUTTING_DOWN	The cluster software is shutting down.
5023	0x0000139F	ERROR_INVALID_STATE	The group or resource is not in the correct state to perform the requested operation.
5024	0x000013A0	ERROR_RESOURCE_PROPERTIES_STORED	The properties were stored but not all changes will take effect until the next time the resource is brought online.
5025	0x000013A1	ERROR_NOT_QUORUM_CLASS	The cluster could not make the specified resource a quorum resource because it does not belong to a shared storage class.
5026	0x000013A2	ERROR_CORE_RESOURCE	The cluster resource could not be deleted since it is a core resource.
5027	0x000013A3	ERROR_QUORUM_RESOURCE_ONLINE_FAILED	The quorum resource failed to come online.
5028	0x000013A4	ERROR_QUORUMLOG_OPEN_FAILED	The quorum log could not be created or mounted successfully.
5029	0x000013A5	ERROR_CLUSTERLOG_CORRUPT	The cluster log is corrupt.
5030	0x000013A6	ERROR_CLUSTERLOG_RECORD_EXCEEDS_MAXSIZE	The record could not be written to the cluster log since it exceeds the maximum size.
5031	0x000013A7	ERROR_CLUSTERLOG_EXCEEDS_MAXSIZE	The cluster log exceeds its maximum size.
5032	0x000013A8	ERROR_CLUSTERLOG_CHKPOINT_NOT_FOUND	No checkpoint record was found in the cluster log.
5033	0x000013A9	ERROR_CLUSTERLOG_NOT_ENOUGH_SPACE	The minimum required disk space needed for logging is not available.
5034	0x000013AA	ERROR_QUORUM_OWNER_ALIVE	The cluster node failed to take control of the quorum resource because the resource is owned by another active node.
5035	0x000013AB	ERROR_NETWORK_NOT_AVAILABLE	A cluster network is not available for this operation.
5036	0x000013AC	ERROR_NODE_NOT_AVAILABLE	A cluster node is not available for this operation.

Error			Description
decimal	Hexadecimal	Name	
5037	0x000013AD	ERROR_ALL_NODES_NOT_AVAILABLE	All cluster nodes must be running to perform this operation.
5038	0x000013AE	ERROR_RESOURCE_FAILED	A cluster resource failed.
5039	0x000013AF	ERROR_CLUSTER_INVALID_NODE	The cluster node is not valid.
5040	0x000013B0	ERROR_CLUSTER_NODE_EXISTS	The cluster node already exists.
5041	0x000013B1	ERROR_CLUSTER_JOIN_IN_PROGRESS	A node is in the process of joining the cluster.
5042	0x000013B2	ERROR_CLUSTER_NODE_NOT_FOUND	The cluster node was not found.
5043	0x000013B3	ERROR_CLUSTER_LOCAL_NODE_NOT_FOUND	The cluster local node information was not found.
5044	0x000013B4	ERROR_CLUSTER_NETWORK_EXISTS	The cluster network already exists.
5045	0x000013B5	ERROR_CLUSTER_NETWORK_NOT_FOUND	The cluster network was not found.
5046	0x000013B6	ERROR_CLUSTER_NETINTERFACE_EXISTS	The cluster network interface already exists.
5047	0x000013B7	ERROR_CLUSTER_NETINTERFACE_NOT_FOUND	The cluster network interface was not found.
5048	0x000013B8	ERROR_CLUSTER_INVALID_REQUEST	The cluster request is not valid for this object.
5049	0x000013B9	ERROR_CLUSTER_INVALID_NETWORK_PROVIDER	The cluster network provider is not valid.
5050	0x000013BA	ERROR_CLUSTER_NODE_DOWN	The cluster node is down.
5051	0x000013BB	ERROR_CLUSTER_NODE_UNREACHABLE	The cluster node is not reachable.
5052	0x000013BC	ERROR_CLUSTER_NODE_NOT_MEMBER	The cluster node is not a member of the cluster.
5053	0x000013BD	ERROR_CLUSTER_JOIN_NOT_IN_PROGRESS	A cluster join operation is not in progress.
5054	0x000013BE	ERROR_CLUSTER_INVALID_NETWORK	The cluster network is not valid.
5056	0x000013C0	ERROR_CLUSTER_NODE_UP	The cluster node is up.
5057	0x000013C1	ERROR_CLUSTER_IPADDR_IN_USE	The cluster IP address is already in use.
5058	0x000013C2	ERROR_CLUSTER_NODE_NOT_PAUSED	The cluster node is not paused.
5059	0x000013C3	ERROR_CLUSTER_NO_SECURITY_CONTEXT	No cluster security context is available.
5060	0x000013C4	ERROR_CLUSTER_NETWORK_NOT_INTERNAL	The cluster network is not configured for internal cluster communication.
5061	0x000013C5	ERROR_CLUSTER_NODE_ALREADY_UP	The cluster node is already up.
5062	0x000013C6	ERROR_CLUSTER_NODE_ALREADY_DOWN	The cluster node is already down.
5063	0x000013C7	ERROR_CLUSTER_NETWORK_ALREADY_ONLINE	The cluster network is already online.
5064	0x000013C8	ERROR_CLUSTER_NETWORK_ALREADY_OFFLINE	The cluster network is already offline.
5065	0x000013C9	ERROR_CLUSTER_NODE_ALREADY_MEMBER	The cluster node is already a member of the cluster.
5066	0x000013CA	ERROR_CLUSTER_LAST_INTERNAL_NETWORK	The cluster network is the only one configured for internal cluster communication between two or more active cluster nodes. The internal communication capability cannot be removed from the network.
5067	0x000013CB	ERROR_CLUSTER_NETWORK_HAS_DEPENDENTS	One or more cluster resources depend on the network to provide service to clients. The client access capability cannot be removed from the network.
5068	0x000013CC	ERROR_INVALID_OPERATION_ON_QUORUM	This operation cannot be performed on the cluster resource as it the quorum resource. You may not bring the quorum resource offline or modify its possible owners list.
5069	0x000013CD	ERROR_DEPENDENCY_NOT_ALLOWED	The cluster quorum resource is not allowed to have any dependencies.
5070	0x000013CE	ERROR_CLUSTER_NODE_PAUSED	The cluster node is paused.
5071	0x000013CF	ERROR_NODE_CANT_HOST_RESOURCE	The cluster resource cannot be brought online. The owner node cannot run this resource.
5072	0x000013D0	ERROR_CLUSTER_NODE_NOT_READY	The cluster node is not ready to perform the requested operation.
5073	0x000013D1	ERROR_CLUSTER_NODE_SHUTTING_DOWN	The cluster node is shutting down.
5074	0x000013D2	ERROR_CLUSTER_JOIN_ABORTED	The cluster join operation was aborted.
5075	0x000013D3	ERROR_CLUSTER_INCOMPATIBLE_VERSIONS	The cluster join operation failed due to incompatible software versions between the joining node and its sponsor.
5076	0x000013D4	ERROR_CLUSTER_MAXNUM_OF_RESOURCES_EXCEEDED	This resource cannot be created because the cluster has reached the limit on the number of resources it can monitor.

Error			Description
decimal	Hexadecimal	Name	
5077	0x000013D5	ERROR_CLUSTER_SYSTEM_CONFIG_CHANGED	The system configuration changed during the cluster join or form operation. The join or form operation was aborted.
5078	0x000013D6	ERROR_CLUSTER_RESOURCE_TYPE_NOT_FOUND	The specified resource type was not found.
5079	0x000013D7	ERROR_CLUSTER_RESTYPE_NOT_SUPPORTED	The specified node does not support a resource of this type. This may be due to version inconsistencies or due to the absence of the resource DLL on this node.
5080	0x000013D8	ERROR_CLUSTER_RESNAME_NOT_FOUND	The specified resource name is supported by this resource DLL. This may be due to a bad (or changed) name supplied to the resource DLL.
5081	0x000013D9	ERROR_CLUSTER_NO_RPC_PACKAGES_REGISTERED	No authentication package could be registered with the RPC server.
5082	0x000013DA	ERROR_CLUSTER_OWNER_NOT_IN_PREFLIST	You cannot bring the group online because the owner of the group is not in the preferred list for the group. To change the owner node for the group, move the group.
5083	0x000013DB	ERROR_CLUSTER_DATABASE_SEQMISMATCH	The join operation failed because the cluster database sequence number has changed or is incompatible with the locker node. This may happen during a join operation if the cluster database was changing during the join.
5084	0x000013DC	ERROR_RESMON_INVALID_STATE	The resource monitor will not allow the fail operation to be performed while the resource is in its current state. This may happen if the resource is in a pending state.
5085	0x000013DD	ERROR_CLUSTER_GUM_NOT_LOCKER	A non locker code got a request to reserve the lock for making global updates.
5086	0x000013DE	ERROR_QUORUM_DISK_NOT_FOUND	The quorum disk could not be located by the cluster service.
5087	0x000013DF	ERROR_DATABASE_BACKUP_CORRUPT	The backup up cluster database is possibly corrupt.
5088	0x000013E0	ERROR_CLUSTER_NODE_ALREADY_HAS_DFS_ROOT	A DFS root already exists in this cluster node.
5089	0x000013E1	ERROR_RESOURCE_PROPERTY_UNCHANGEABLE	An attempt to modify a resource property failed because it conflicts with another existing property.
5890	0x00001702	ERROR_CLUSTER_MEMBERSHIP_INVALID_STATE	An operation was attempted that is incompatible with the current membership state of the node.
5891	0x00001703	ERROR_CLUSTER_QUORUMLOG_NOT_FOUND	The quorum resource does not contain the quorum log.
5892	0x00001704	ERROR_CLUSTER_MEMBERSHIP_HALT	The membership engine requested shutdown of the cluster service on this node.
5893	0x00001705	ERROR_CLUSTER_INSTANCE_ID_MISMATCH	The join operation failed because the cluster instance ID of the joining node does not match the cluster instance ID of the sponsor node.
5894	0x00001706	ERROR_CLUSTER_NETWORK_NOT_FOUND_FOR_IP	A matching network for the specified IP address could not be found. Please also specify a subnet mask and a cluster network.
5895	0x00001707	ERROR_CLUSTER_PROPERTY_DATA_TYPE_MISMATCH	The actual data type of the property did not match the expected data type of the property.
5896	0x00001708	ERROR_CLUSTER_EVICT_WITHOUT_CLEANUP	The cluster node was evicted from the cluster successfully. The node was not cleaned up because it does not support the evict cleanup functionality.

Error			Description
decimal	Hexadecimal	Name	
6000	0x00001770	ERROR_ENCRYPTION_FAILED	The specified file could not be encrypted.
6001	0x00001771	ERROR_DECRYPTION_FAILED	The specified file could not be decrypted.
6002	0x00001772	ERROR_FILE_ENCRYPTED	The specified file is encrypted and the user does not have the ability to decrypt it.
6003	0x00001773	ERROR_NO_RECOVERY_POLICY	There is no valid encryption recovery policy configured for this system.
6004	0x00001774	ERROR_NO_EFS	The required encryption driver is not loaded for this system.
6005	0x00001775	ERROR_WRONG_EFS	The file was encrypted with a different encryption driver than is currently loaded.
6006	0x00001776	ERROR_NO_USER_KEYS	There are no EFS keys defined for the user.
6007	0x00001777	ERROR_FILE_NOT_ENCRYPTED	The specified file is not encrypted.
6008	0x00001778	ERROR_NOT_EXPORT_FORMAT	The specified file is not in the defined EFS export format.
6009	0x00001779	ERROR_FILE_READ_ONLY	The specified file is read only.
6010	0x0000177A	ERROR_DIR_EFS_DISALLOWED	The directory has been disabled for encryption.
6011	0x0000177B	ERROR_EFS_SERVER_NOT_TRUSTED	The server is not trusted for remote encryption operation.
6012	0x0000177C	ERROR_BAD_RECOVERY_POLICY	Recovery policy configured for this system contains invalid recovery certificate.
6013	0x0000177D	ERROR_EFS_ALG_BLOB_TOO_BIG	The encryption algorithm used on the source file needs a bigger key buffer than the one on the destination file.
6014	0x0000177E	ERROR_VOLUME_NOT_SUPPORT_EFS	The disk partition does not support file encryption.
6118	0x000017E6	ERROR_NO_BROWSER_SERVERS_FOUND	The list of servers for this workgroup is not currently available.
6200	0x00001838	SCHED_E_SERVICE_NOT_LOCALSYSTEM	The Task Scheduler service must be configured to run in the System account to function properly. Individual tasks may be configured to run in other accounts.
7001	0x00001B59	ERROR_CTX_WINSTATION_NAME_INVALID	The specified session name is invalid.
7002	0x00001B5A	ERROR_CTX_INVALID_PD	The specified protocol driver is invalid.
7003	0x00001B5B	ERROR_CTX_PD_NOT_FOUND	The specified protocol driver was not found in the system path.
7004	0x00001B5C	ERROR_CTX_WD_NOT_FOUND	The specified terminal connection driver was not found in the system path.
7005	0x00001B5D	ERROR_CTX_CANNOT_MAKE_EVENTLOG_ENTRY	A registry key for event logging could not be created for this session.
7006	0x00001B5E	ERROR_CTX_SERVICE_NAME_COLLISION	A service with the same name already exists on the system.
7007	0x00001B5F	ERROR_CTX_CLOSE_PENDING	A close operation is pending on the session.
7008	0x00001B60	ERROR_CTX_NO_OUTBUF	There are no free output buffers available.
7009	0x00001B61	ERROR_CTX_MODEM_INF_NOT_FOUND	The MODEM.INF file was not found.
7010	0x00001B62	ERROR_CTX_INVALID_MODEMNAME	The modem name was not found in MODEM.INF.
7011	0x00001B63	ERROR_CTX_MODEM_RESPONSE_ERROR	The modem did not accept the command sent to it. Verify that the configured modem name matches the attached modem.
7012	0x00001B64	ERROR_CTX_MODEM_RESPONSE_TIMEOUT	The modem did not respond to the command sent to it. Verify that the modem is properly cabled and powered on.
7013	0x00001B65	ERROR_CTX_MODEM_RESPONSE_NO_CARRIER	Carrier detect has failed or carrier has been dropped due to disconnect.
7014	0x00001B66	ERROR_CTX_MODEM_RESPONSE_NO_DIALTONE	Dial tone not detected within the required time. Verify that the phone cable is properly attached and functional.
7015	0x00001B67	ERROR_CTX_MODEM_RESPONSE_BUSY	Busy signal detected at remote site on callback.
7016	0x00001B68	ERROR_CTX_MODEM_RESPONSE_VOICE	Voice detected at remote site on callback.
7017	0x00001B69	ERROR_CTX_TD_ERROR	Transport driver error
7022	0x00001B6E	ERROR_CTX_WINSTATION_NOT_FOUND	The specified session cannot be found.
7023	0x00001B6F	ERROR_CTX_WINSTATION_ALREADY_EXISTS	The specified session name is already in use.
7024	0x00001B70	ERROR_CTX_WINSTATION_BUSY	The requested operation cannot be completed because the terminal connection is currently busy processing a connect, disconnect, reset, or delete operation.

Error			Description
decimal	Hexadecimal	Name	
7025	0x00001B71	ERROR_CTX_BAD_VIDEO_MODE	An attempt has been made to connect to a session whose video mode is not supported by the current client.
7035	0x00001B7B	ERROR_CTX_GRAPHICS_INVALID	The application attempted to enable DOS graphics mode. DOS graphics mode is not supported.
7037	0x00001B7D	ERROR_CTX_LOGON_DISABLED	Your interactive logon privilege has been disabled. Please contact your administrator.
7038	0x00001B7E	ERROR_CTX_NOT_CONSOLE	The requested operation can be performed only on the system console. This is most often the result of a driver or system DLL requiring direct console access.
7040	0x00001B80	ERROR_CTX_CLIENT_QUERY_TIMEOUT	The client failed to respond to the server connect message.
7041	0x00001B81	ERROR_CTX_CONSOLE_DISCONNECT	Disconnecting the console session is not supported.
7042	0x00001B82	ERROR_CTX_CONSOLE_CONNECT	Reconnecting a disconnected session to the console is not supported.
7044	0x00001B84	ERROR_CTX_SHADOW_DENIED	The request to control another session remotely was denied.
7045	0x00001B85	ERROR_CTX_WINSTATION_ACCESS_DENIED	The requested session access is denied.
7049	0x00001B89	ERROR_CTX_INVALID_WD	The specified terminal connection driver is invalid.
7050	0x00001B8A	ERROR_CTX_SHADOW_INVALID	The requested session cannot be controlled remotely. This may be because the session is disconnected or does not currently have a user logged on.
7051	0x00001B8B	ERROR_CTX_SHADOW_DISABLED	The requested session is not configured to allow remote control.
7052	0x00001B8C	ERROR_CTX_CLIENT_LICENSE_IN_USE	Your request to connect to this Terminal Server has been rejected. Your Terminal Server client license number is currently being used by another user. Please call your system administrator to obtain a unique license number.
7053	0x00001B8D	ERROR_CTX_CLIENT_LICENSE_NOT_SET	Your request to connect to this Terminal Server has been rejected. Your Terminal Server client license number has not been entered for this copy of the Terminal Server client. Please contact your system administrator.
7054	0x00001B8E	ERROR_CTX_LICENSE_NOT_AVAILABLE	The system has reached its licensed logon limit. Please try again later.
7055	0x00001B8F	ERROR_CTX_LICENSE_CLIENT_INVALID	The client you are using is not licensed to use this system. Your logon request is denied.
7056	0x00001B90	ERROR_CTX_LICENSE_EXPIRED	The system license has expired. Your logon request is denied.
7057	0x00001B91	ERROR_CTX_SHADOW_NOT_RUNNING	Remote control could not be terminated because the specified session is not currently being remotely controlled.

Error			Description
decimal	Hexadecimal	Name	
8001	0x00001F41	FRS_ERR_INVALID_API_SEQUENCE	The file replication service API was called incorrectly.
8002	0x00001F42	FRS_ERR_STARTING_SERVICE	The file replication service cannot be started.
8003	0x00001F43	FRS_ERR_STOPPING_SERVICE	The file replication service cannot be stopped.
8004	0x00001F44	FRS_ERR_INTERNAL_API	The file replication service API terminated the request. The event log may have more information.
8005	0x00001F45	FRS_ERR_INTERNAL	The file replication service terminated the request. The event log may have more information.
8006	0x00001F46	FRS_ERR_SERVICE_COMM	The file replication service cannot be contacted. The event log may have more information.
8007	0x00001F47	FRS_ERR_INSUFFICIENT_PRIV	The file replication service cannot satisfy the request because the user has insufficient privileges. The event log may have more information.
8008	0x00001F48	FRS_ERR_AUTHENTICATION	The file replication service cannot satisfy the request because authenticated RPC is not available. The event log may have more information.
8009	0x00001F49	FRS_ERR_PARENT_INSUFFICIENT_PRIV	The file replication service cannot satisfy the request because the user has insufficient privileges on the domain controller. The event log may have more information.
8010	0x00001F4A	FRS_ERR_PARENT_AUTHENTICATION	The file replication service cannot satisfy the request because authenticated RPC is not available on the domain controller. The event log may have more information.
8011	0x00001F4B	FRS_ERR_CHILD_TO_PARENT_COMM	The file replication service cannot communicate with the file replication service on the domain controller. The event log may have more information.
8012	0x00001F4C	FRS_ERR_PARENT_TO_CHILD_COMM	The file replication service on the domain controller cannot communicate with the file replication service on this computer. The event log may have more information.
8013	0x00001F4D	FRS_ERR_SYSVOL_POPULATE	The file replication service cannot populate the system volume because of an internal error. The event log may have more information.
8014	0x00001F4E	FRS_ERR_SYSVOL_POPULATE_TIMEOUT	The file replication service cannot populate the system volume because of an internal timeout. The event log may have more information.
8015	0x00001F4F	FRS_ERR_SYSVOL_IS_BUSY	The file replication service cannot process the request. The system volume is busy with a previous request.
8016	0x00001F50	FRS_ERR_SYSVOL_DEMOTE	The file replication service cannot stop replicating the system volume because of an internal error. The event log may have more information.
8017	0x00001F51	FRS_ERR_INVALID_SERVICE_PARAMETER	The file replication service detected an invalid parameter.
8200	0x00002008	ERROR_DS_NOT_INSTALLED	An error occurred while installing the directory service. For more information, see the event log.
8201	0x00002009	ERROR_DS_MEMBERSHIP_EVALUATED_LOCALLY	The directory service evaluated group memberships locally.
8202	0x0000200A	ERROR_DS_NO_ATTRIBUTE_OR_VALUE	The specified directory service attribute or value does not exist.
8203	0x0000200B	ERROR_DS_INVALID_ATTRIBUTE_SYNTAX	The attribute syntax specified to the directory service is invalid.
8204	0x0000200C	ERROR_DS_ATTRIBUTE_TYPE_UNDEFINED	The attribute type specified to the directory service is not defined.
8205	0x0000200D	ERROR_DS_ATTRIBUTE_OR_VALUE_EXISTS	The specified directory service attribute or value already exists.
8206	0x0000200E	ERROR_DS_BUSY	The directory service is busy.
8207	0x0000200F	ERROR_DS_UNAVAILABLE	The directory service is unavailable.
8208	0x00002010	ERROR_DS_NO_RIDS_ALLOCATED	The directory service was unable to allocate a relative identifier.
8209	0x00002011	ERROR_DS_NO_MORE_RIDS	The directory service has exhausted the pool of relative identifiers.

Error			Description
decimal	Hexadecimal	Name	
8210	0x00002012	ERROR_DS_INCORRECT_ROLE_OWNER	The requested operation could not be performed because the directory service is not the master for that type of operation.
8211	0x00002013	ERROR_DS_RIDMGR_INIT_ERROR	The directory service was unable to initialize the subsystem that allocates relative identifiers.
8212	0x00002014	ERROR_DS_OBJ_CLASS_VIOLATION	The requested operation did not satisfy one or more constraints associated with the class of the object.
8213	0x00002015	ERROR_DS_CANT_ON_NON_LEAF	The directory service can perform the requested operation only on a leaf object.
8214	0x00002016	ERROR_DS_CANT_ON_RDN	The directory service cannot perform the requested operation on the RDN attribute of an object.
8215	0x00002017	ERROR_DS_CANT_MOD_OBJ_CLASS	The directory service detected an attempt to modify the object class of an object.
8216	0x00002018	ERROR_DS_CROSS_DOM_MOVE_ERROR	The requested cross-domain move operation could not be performed.
8217	0x00002019	ERROR_DS_GC_NOT_AVAILABLE	Unable to contact the global catalog server.
8218	0x0000201A	ERROR_SHARED_POLICY	The policy object is shared and can only be modified at the root.
8219	0x0000201B	ERROR_POLICY_OBJECT_NOT_FOUND	The policy object does not exist.
8220	0x0000201C	ERROR_POLICY_ONLY_IN_DS	The requested policy information is only in the directory service.
8221	0x0000201D	ERROR_PROMOTION_ACTIVE	A domain controller promotion is currently active.
8222	0x0000201E	ERROR_NO_PROMOTION_ACTIVE	A domain controller promotion is not currently active
8224	0x00002020	ERROR_DS_OPERATIONS_ERROR	An operations error occurred.
8225	0x00002021	ERROR_DS_PROTOCOL_ERROR	A protocol error occurred.
8226	0x00002022	ERROR_DS_TIMELIMIT_EXCEEDED	The time limit for this request was exceeded.
8227	0x00002023	ERROR_DS_SIZELIMIT_EXCEEDED	The size limit for this request was exceeded.
8228	0x00002024	ERROR_DS_ADMIN_LIMIT_EXCEEDED	The administrative limit for this request was exceeded.
8229	0x00002025	ERROR_DS_COMPARE_FALSE	The compare response was false.
8230	0x00002026	ERROR_DS_COMPARE_TRUE	The compare response was true.
8231	0x00002027	ERROR_DS_AUTH_METHOD_NOT_SUPPORTED	The requested authentication method is not supported by the server.
8232	0x00002028	ERROR_DS_STRONG_AUTH_REQUIRED	A more secure authentication method is required for this server.
8233	0x00002029	ERROR_DS_INAPPROPRIATE_AUTH	Inappropriate authentication.
8234	0x0000202A	ERROR_DS_AUTH_UNKNOWN	The authentication mechanism is unknown.
8235	0x0000202B	ERROR_DS_REFERRAL	A referral was returned from the server.
8236	0x0000202C	ERROR_DS_UNAVAILABLE_CRIT_EXTENSION	The server does not support the requested critical extension.
8237	0x0000202D	ERROR_DS_CONFIDENTIALITY_REQUIRED	This request requires a secure connection.
8238	0x0000202E	ERROR_DS_INAPPROPRIATE_MATCHING	Inappropriate matching.
8239	0x0000202F	ERROR_DS_CONSTRAINT_VIOLATION	A constraint violation occurred.
8240	0x00002030	ERROR_DS_NO_SUCH_OBJECT	There is no such object on the server.
8241	0x00002031	ERROR_DS_ALIAS_PROBLEM	There is an alias problem.
8242	0x00002032	ERROR_DS_INVALID_DN_SYNTAX	An invalid dn syntax has been specified.
8243	0x00002033	ERROR_DS_IS_LEAF	The object is a leaf object.
8244	0x00002034	ERROR_DS_ALIAS_DEREF_PROBLEM	There is an alias dereferencing problem.
8245	0x00002035	ERROR_DS_UNWILLING_TO_PERFORM	The server is unwilling to process the request.
8246	0x00002036	ERROR_DS_LOOP_DETECT	A loop has been detected.
8247	0x00002037	ERROR_DS_NAMING_VIOLATION	There is a naming violation.
8248	0x00002038	ERROR_DS_OBJECT_RESULTS_TOO_LARGE	The result set is too large.
8249	0x00002039	ERROR_DS_AFFECTS_MULTIPLE_DSAS	The operation affects multiple DSAs
8250	0x0000203A	ERROR_DS_SERVER_DOWN	The server is not operational.
8251	0x0000203B	ERROR_DS_LOCAL_ERROR	A local error has occurred.
8252	0x0000203C	ERROR_DS_ENCODING_ERROR	An encoding error has occurred.
8253	0x0000203D	ERROR_DS_DECODING_ERROR	A decoding error has occurred.
8254	0x0000203E	ERROR_DS_FILTER_UNKNOWN	The search filter cannot be recognized.

Error			Description
decimal	Hexadecimal	Name	
8255	0x0000203F	ERROR_DS_PARAM_ERROR	One or more parameters are illegal.
8256	0x00002040	ERROR_DS_NOT_SUPPORTED	The specified method is not supported.
8257	0x00002041	ERROR_DS_NO_RESULTS_RETURNED	No results were returned.
8258	0x00002042	ERROR_DS_CONTROL_NOT_FOUND	The specified control is not supported by the server.
8259	0x00002043	ERROR_DS_CLIENT_LOOP	A referral loop was detected by the client.
8260	0x00002044	ERROR_DS_REFERRAL_LIMIT_EXCEEDED	The preset referral limit was exceeded.
8261	0x00002045	ERROR_DS_SORT_CONTROL_MISSING	The search requires a SORT control.
8262	0x00002046	ERROR_DS_OFFSET_RANGE_ERROR	The search results exceed the offset range specified.
8301	0x0000206D	ERROR_DS_ROOT_MUST_BE_NC	The root object must be the head of a naming context. The root object cannot have an instantiated parent.
8302	0x0000206E	ERROR_DS_ADD_REPLICA_INHIBITED	The add replica operation cannot be performed. The naming context must be writable in order to create the replica.
8303	0x0000206F	ERROR_DS_ATT_NOT_DEF_IN_SCHEMA	A reference to an attribute that is not defined in the schema occurred.
8304	0x00002070	ERROR_DS_MAX_OBJ_SIZE_EXCEEDED	The maximum size of an object has been exceeded.
8305	0x00002071	ERROR_DS_OBJ_STRING_NAME_EXISTS	An attempt was made to add an object to the directory with a name that is already in use.
8306	0x00002072	ERROR_DS_NO_RDN_DEFINED_IN_SCHEMA	An attempt was made to add an object of a class that does not have an RDN defined in the schema.
8307	0x00002073	ERROR_DS_RDN_DOESNT_MATCH_SCHEMA	An attempt was made to add an object using an RDN that is not the RDN defined in the schema.
8308	0x00002074	ERROR_DS_NO_REQUESTED_ATTS_FOUND	None of the requested attributes were found on the objects.
8309	0x00002075	ERROR_DS_USER_BUFFER_TO_SMALL	The user buffer is too small.
8310	0x00002076	ERROR_DS_ATT_IS_NOT_ON_OBJ	The attribute specified in the operation is not present on the object.
8311	0x00002077	ERROR_DS_ILLEGAL_MOD_OPERATION	Illegal modify operation. Some aspect of the modification is not permitted.
8312	0x00002078	ERROR_DS_OBJ_TOO_LARGE	The specified object is too large.
8313	0x00002079	ERROR_DS_BAD_INSTANCE_TYPE	The specified instance type is not valid.
8314	0x0000207A	ERROR_DS_MASTERDSA_REQUIRED	The operation must be performed at a master DSA.
8315	0x0000207B	ERROR_DS_OBJECT_CLASS_REQUIRED	The object class attribute must be specified.
8316	0x0000207C	ERROR_DS_MISSING_REQUIRED_ATT	A required attribute is missing.
8317	0x0000207D	ERROR_DS_ATT_NOT_DEF_FOR_CLASS	An attempt was made to modify an object to include an attribute that is not legal for its class
8318	0x0000207E	ERROR_DS_ATT_ALREADY_EXISTS	The specified attribute is already present on the object.
8320	0x00002080	ERROR_DS_CANT_ADD_ATT_VALUES	The specified attribute is not present, or has no values.
8321	0x00002081	ERROR_DS_SINGLE_VALUE_CONSTRAINT	Multiple values were specified for an attribute that can have only one value.
8322	0x00002082	ERROR_DS_RANGE_CONSTRAINT	A value for the attribute was not in the acceptable range of values.
8323	0x00002083	ERROR_DS_ATT_VAL_ALREADY_EXISTS	The specified value already exists.
8324	0x00002084	ERROR_DS_CANT_REM_MISSING_ATT	The attribute cannot be removed because it is not present on the object.
8325	0x00002085	ERROR_DS_CANT_REM_MISSING_ATT_VAL	The attribute value cannot be removed because it is not present on the object.
8326	0x00002086	ERROR_DS_ROOT_CANT_BE_SUBREF	The specified root object cannot be a subref.
8327	0x00002087	ERROR_DS_NO_CHAINING	Chaining is not permitted.
8328	0x00002088	ERROR_DS_NO_CHAINED_EVAL	Chained evaluation is not permitted.
8329	0x00002089	ERROR_DS_NO_PARENT_OBJECT	The operation could not be performed because the object's parent is either uninstantiated or deleted.
8330	0x0000208A	ERROR_DS_PARENT_IS_AN_ALIAS	Having a parent that is an alias is not permitted. Aliases are leaf objects.

Error			Description
decimal	Hexadecimal	Name	
8331	0x0000208B	ERROR_DS_CANT_MIX_MASTER_AND_REPS	The object and parent must be of the same type, either both masters or both replicas.
8332	0x0000208C	ERROR_DS_CHILDREN_EXIST	The operation cannot be performed because child objects exist. This operation can only be performed on a leaf object.
8333	0x0000208D	ERROR_DS_OBJ_NOT_FOUND	Directory object not found.
8334	0x0000208E	ERROR_DS_ALIASED_OBJ_MISSING	The aliased object is missing.
8335	0x0000208F	ERROR_DS_BAD_NAME_SYNTAX	The object name has bad syntax.
8336	0x00002090	ERROR_DS_ALIAS_POINTS_TO_ALIAS	It is not permitted for an alias to refer to another alias.
8337	0x00002091	ERROR_DS_CANT_DEREF_ALIAS	The alias cannot be dereferenced.
8338	0x00002092	ERROR_DS_OUT_OF_SCOPE	The operation is out of scope.
8339	0x00002093	ERROR_DS_OBJECT_BEING_REMOVED	The operation cannot continue because the object is in the process of being removed.
8340	0x00002094	ERROR_DS_CANT_DELETE_DSA_OBJ	The DSA object cannot be deleted.
8341	0x00002095	ERROR_DS_GENERIC_ERROR	A directory service error has occurred.
8342	0x00002096	ERROR_DS_DSA_MUST_BE_INT_MASTER	The operation can only be performed on an internal master DSA object.
8343	0x00002097	ERROR_DS_CLASS_NOT_DSA	The object must be of class DSA.
8344	0x00002098	ERROR_DS_INSUFF_ACCESS_RIGHTS	Insufficient access rights to perform the operation.
8345	0x00002099	ERROR_DS_ILLEGAL_SUPERIOR	The object cannot be added because the parent is not on the list of possible superiors.
8346	0x0000209A	ERROR_DS_ATTRIBUTE_OWNED_BY_SAM	Access to the attribute is not permitted because the attribute is owned by the Security Accounts Manager (SAM).
8347	0x0000209B	ERROR_DS_NAME_TOO_MANY_PARTS	The name has too many parts.
8348	0x0000209C	ERROR_DS_NAME_TOO_LONG	The name is too long.
8349	0x0000209D	ERROR_DS_NAME_VALUE_TOO_LONG	The name value is too long.
8350	0x0000209E	ERROR_DS_NAME_UNPARSEABLE	The directory service encountered an error parsing a name.
8351	0x0000209F	ERROR_DS_NAME_TYPE_UNKNOWN	The directory service cannot get the attribute type for a name.
8352	0x000020A0	ERROR_DS_NOT_AN_OBJECT	The name does not identify an object; the name identifies a phantom.
8353	0x000020A1	ERROR_DS_SEC_DESC_TOO_SHORT	The security descriptor is too short.
8354	0x000020A2	ERROR_DS_SEC_DESC_INVALID	The security descriptor is invalid.
8355	0x000020A3	ERROR_DS_NO_DELETED_NAME	Failed to create name for deleted object.
8356	0x000020A4	ERROR_DS_SUBREF_MUST_HAVE_PARENT	The parent of a new subref must exist.
8357	0x000020A5	ERROR_DS_NCNAME_MUST_BE_NC	The object must be a naming context.
8358	0x000020A6	ERROR_DS_CANT_ADD_SYSTEM_ONLY	It is not permitted to add an attribute which is owned by the system.
8359	0x000020A7	ERROR_DS_CLASS_MUST_BE_CONCRETE	The class of the object must be structural; you cannot instantiate an abstract class.
8360	0x000020A8	ERROR_DS_INVALID_DMD	The schema object could not be found.
8361	0x000020A9	ERROR_DS_OBJ_GUID_EXISTS	A local object with this GUID (dead or alive) already exists.
8362	0x000020AA	ERROR_DS_NOT_ON_BACKLINK	The operation cannot be performed on a back link.
8363	0x000020AB	ERROR_DS_NO_CROSSREF_FOR_NC	The cross reference for the specified naming context could not be found.
8364	0x000020AC	ERROR_DS_SHUTTING_DOWN	The operation could not be performed because the directory service is shutting down.
8365	0x000020AD	ERROR_DS_UNKNOWN_OPERATION	The directory service request is invalid.
8366	0x000020AE	ERROR_DS_INVALID_ROLE_OWNER	The role owner attribute could not be read.
8367	0x000020AF	ERROR_DS_COULDNT_CONTACT_FSMO	The requested FSMO operation failed. The current FSMO holder could not be reached.
8368	0x000020B0	ERROR_DS_CROSS_NC_DN_RENAME	Modification of a DN across a naming context is not permitted.
8369	0x000020B1	ERROR_DS_CANT_MOD_SYSTEM_ONLY	The attribute cannot be modified because it is owned by the system.
8370	0x000020B2	ERROR_DS_REPLICATOR_ONLY	Only the replicator can perform this function.
8371	0x000020B3	ERROR_DS_OBJ_CLASS_NOT_DEFINED	The specified class is not defined.

Error			Description
decimal	Hexadecimal	Name	
8372	0x000020B4	ERROR_DS_OBJ_CLASS_NOT_SUBCLASS	The specified class is not a subclass.
8373	0x000020B5	ERROR_DS_NAME_REFERENCE_INVALID	The name reference is invalid.
8374	0x000020B6	ERROR_DS_CROSS_REF_EXISTS	A cross reference already exists.
8375	0x000020B7	ERROR_DS_CANT_DEL_MASTER_CROSSREF	It is not permitted to delete a master cross reference.
8376	0x000020B8	ERROR_DS_SUBTREE_NOTIFY_NOT_NC_HEAD	Subtree notifications are only supported on NC heads.
8377	0x000020B9	ERROR_DS_NOTIFY_FILTER_TOO_COMPLEX	Notification filter is too complex.
8378	0x000020BA	ERROR_DS_DUP_RDN	Schema update failed: duplicate RDN.
8379	0x000020BB	ERROR_DS_DUP_OID	Schema update failed: duplicate OID
8380	0x000020BC	ERROR_DS_DUP_MAPI_ID	Schema update failed: duplicate MAPI identifier.
8381	0x000020BD	ERROR_DS_DUP_SCHEMA_ID_GUID	Schema update failed: duplicate schema-id GUID.
8382	0x000020BE	ERROR_DS_DUP_LDAP_DISPLAY_NAME	Schema update failed: duplicate LDAP display name.
8383	0x000020BF	ERROR_DS_SEMANTIC_ATT_TEST	Schema update failed: range-lower less than range upper
8384	0x000020C0	ERROR_DS_SYNTAX_MISMATCH	Schema update failed: syntax mismatch
8385	0x000020C1	ERROR_DS_EXISTS_IN_MUST_HAVE	Schema deletion failed: attribute is used in must-contain
8386	0x000020C2	ERROR_DS_EXISTS_IN_MAY_HAVE	Schema deletion failed: attribute is used in may-contain
8387	0x000020C3	ERROR_DS_NONEXISTENT_MAY_HAVE	Schema update failed: attribute in may-contain does not exist
8388	0x000020C4	ERROR_DS_NONEXISTENT_MUST_HAVE	Schema update failed: attribute in must-contain does not exist
8389	0x000020C5	ERROR_DS_AUX_CLS_TEST_FAIL	Schema update failed: class in aux-class list does not exist or is not an auxiliary class
8390	0x000020C6	ERROR_DS_NONEXISTENT_POSS_SUP	Schema update failed: class in poss-superiors does not exist
8391	0x000020C7	ERROR_DS_SUB_CLS_TEST_FAIL	Schema update failed: class in subclassof list does not exist or does not satisfy hierarchy rules
8392	0x000020C8	ERROR_DS_BAD_RDN_ATT_ID_SYNTAX	Schema update failed: Rdn-Att-Id has wrong syntax
8393	0x000020C9	ERROR_DS_EXISTS_IN_AUX_CLS	Schema deletion failed: class is used as auxiliary class
8394	0x000020CA	ERROR_DS_EXISTS_IN_SUB_CLS	Schema deletion failed: class is used as sub class
8395	0x000020CB	ERROR_DS_EXISTS_IN_POSS_SUP	Schema deletion failed: class is used as poss superior
8396	0x000020CC	ERROR_DS_RECALCSCHEMA_FAILED	Schema update failed in recalculating validation cache.
8397	0x000020CD	ERROR_DS_TREE_DELETE_NOT_FINISHED	The tree deletion is not finished.
8398	0x000020CE	ERROR_DS_CANT_DELETE	The requested delete operation could not be performed.
8399	0x000020CF	ERROR_DS_ATT_SCHEMA_REQ_ID	Cannot read the governs class identifier for the schema record.
8400	0x000020D0	ERROR_DS_BAD_ATT_SCHEMA_SYNTAX	The attribute schema has bad syntax.
8401	0x000020D1	ERROR_DS_CANT_CACHE_ATT	The attribute could not be cached.
8402	0x000020D2	ERROR_DS_CANT_CACHE_CLASS	The class could not be cached.
8403	0x000020D3	ERROR_DS_CANT_REMOVE_ATT_CACHE	The attribute could not be removed from the cache.
8404	0x000020D4	ERROR_DS_CANT_REMOVE_CLASS_CACHE	The class could not be removed from the cache.
8405	0x000020D5	ERROR_DS_CANT_RETRIEVE_DN	The distinguished name attribute could not be read.
8406	0x000020D6	ERROR_DS_MISSING_SUPREF	A required subref is missing.
8407	0x000020D7	ERROR_DS_CANT_RETRIEVE_INSTANCE	The instance type attribute could not be retrieved.
8408	0x000020D8	ERROR_DS_CODE_INCONSISTENCY	An internal error has occurred.
8409	0x000020D9	ERROR_DS_DATABASE_ERROR	A database error has occurred.
8410	0x000020DA	ERROR_DS_GOVERNSID_MISSING	The attribute GOVERNSID is missing.
8411	0x000020DB	ERROR_DS_MISSING_EXPECTED_ATT	An expected attribute is missing.
8412	0x000020DC	ERROR_DS_NCNAME_MISSING_CR_REF	The specified naming context is missing a cross reference.
8413	0x000020DD	ERROR_DS_SECURITY_CHECKING_ERROR	A security checking error has occurred.

Error			Description
decimal	Hexadecimal	Name	
8414	0x000020DE	ERROR_DS_SCHEMA_NOT_LOADED	The schema is not loaded.
8415	0x000020DF	ERROR_DS_SCHEMA_ALLOC_FAILED	Schema allocation failed. Please check if the machine is running low on memory.
8416	0x000020E0	ERROR_DS_ATT_SCHEMA_REQ_SYNTAX	Failed to obtain the required syntax for the attribute schema.
8417	0x000020E1	ERROR_DS_GCVERIFY_ERROR	The global catalog verification failed. The global catalog is not available or does not support the operation. Some part of the directory is currently not available.
8418	0x000020E2	ERROR_DS_DRA_SCHEMA_MISMATCH	The replication operation failed because of a schema mismatch between the servers involved.
8419	0x000020E3	ERROR_DS_CANT_FIND_DSA_OBJ	The DSA object could not be found.
8420	0x000020E4	ERROR_DS_CANT_FIND_EXPECTED_NC	The naming context could not be found.
8421	0x000020E5	ERROR_DS_CANT_FIND_NC_IN_CACHE	The naming context could not be found in the cache.
8422	0x000020E6	ERROR_DS_CANT_RETRIEVE_CHILD	The child object could not be retrieved.
8423	0x000020E7	ERROR_DS_SECURITY_ILLEGAL_MODIFY	The modification was not permitted for security reasons.
8424	0x000020E8	ERROR_DS_CANT_REPLACE_HIDDEN_REC	The operation cannot replace the hidden record.
8425	0x000020E9	ERROR_DS_BAD_HIERARCHY_FILE	The hierarchy file is invalid.
8426	0x000020EA	ERROR_DS_BUILD_HIERARCHY_TABLE_FAILED	The attempt to build the hierarchy table failed.
8427	0x000020EB	ERROR_DS_CONFIG_PARAM_MISSING	The directory configuration parameter is missing from the registry.
8428	0x000020EC	ERROR_DS_COUNTING_AB_INDICES_FAILED	The attempt to count the address book indices failed.
8429	0x000020ED	ERROR_DS_HIERARCHY_TABLE_MALLOC_FAILED	The allocation of the hierarchy table failed.
8430	0x000020EE	ERROR_DS_INTERNAL_FAILURE	The directory service encountered an internal failure.
8431	0x000020EF	ERROR_DS_UNKNOWN_ERROR	The directory service encountered an unknown failure.
8432	0x000020F0	ERROR_DS_ROOT_REQUIRES_CLASS_TOP	A root object requires a class of 'top'.
8433	0x000020F1	ERROR_DS_REFUSING_FSMO_ROLES	This directory server is shutting down, and cannot take ownership of new floating single-master operation roles.
8434	0x000020F2	ERROR_DS_MISSING_FSMO_SETTINGS	The directory service is missing mandatory configuration information, and is unable to determine the ownership of floating single-master operation roles.
8435	0x000020F3	ERROR_DS_UNABLE_TO_SURRENDER_ROLES	The directory service was unable to transfer ownership of one or more floating single-master operation roles to other servers.
8436	0x000020F4	ERROR_DS_DRA_GENERIC	The replication operation failed.
8437	0x000020F5	ERROR_DS_DRA_INVALID_PARAMETER	An invalid parameter was specified for this replication operation.
8438	0x000020F6	ERROR_DS_DRA_BUSY	The directory service is too busy to complete the replication operation at this time.
8439	0x000020F7	ERROR_DS_DRA_BAD_DN	The distinguished name specified for this replication operation is invalid.
8440	0x000020F8	ERROR_DS_DRA_BAD_NC	The naming context specified for this replication operation is invalid.
8441	0x000020F9	ERROR_DS_DRA_DN_EXISTS	The distinguished name specified for this replication operation already exists.
8442	0x000020FA	ERROR_DS_DRA_INTERNAL_ERROR	The replication system encountered an internal error.
8443	0x000020FB	ERROR_DS_DRA_INCONSISTENT_DIT	The replication operation encountered a database inconsistency.
8444	0x000020FC	ERROR_DS_DRA_CONNECTION_FAILED	The server specified for this replication operation could not be contacted.
8445	0x000020FD	ERROR_DS_DRA_BAD_INSTANCE_TYPE	The replication operation encountered an object with an invalid instance type.
8446	0x000020FE	ERROR_DS_DRA_OUT_OF_MEM	The replication operation failed to allocate memory.
8447	0x000020FF	ERROR_DS_DRA_MAIL_PROBLEM	The replication operation encountered an error with the mail system.

Error			Description
decimal	Hexadecimal	Name	
8448	0x00002100	ERROR_DS_DRA_REF_ALREADY_EXISTS	The replication reference information for the target server already exists.
8449	0x00002101	ERROR_DS_DRA_REF_NOT_FOUND	The replication reference information for the target server does not exist.
8450	0x00002102	ERROR_DS_DRA_OBJ_IS_REP_SOURCE	The naming context cannot be removed because it is replicated to another server.
8451	0x00002103	ERROR_DS_DRA_DB_ERROR	The replication operation encountered a database error.
8452	0x00002104	ERROR_DS_DRA_NO_REPLICA	The naming context is in the process of being removed or is not replicated from the specified server.
8453	0x00002105	ERROR_DS_DRA_ACCESS_DENIED	Replication access was denied.
8454	0x00002106	ERROR_DS_DRA_NOT_SUPPORTED	The requested operation is not supported by this version of the directory service.
8455	0x00002107	ERROR_DS_DRA_RPC_CANCELLED	The replication remote procedure call was cancelled.
8456	0x00002108	ERROR_DS_DRA_SOURCE_DISABLED	The source server is currently rejecting replication requests.
8457	0x00002109	ERROR_DS_DRA_SINK_DISABLED	The destination server is currently rejecting replication requests.
8458	0x0000210A	ERROR_DS_DRA_NAME_COLLISION	The replication operation failed due to a collision of object names.
8459	0x0000210B	ERROR_DS_DRA_SOURCE_REINSTALLED	The replication source has been reinstalled.
8460	0x0000210C	ERROR_DS_DRA_MISSING_PARENT	The replication operation failed because a required parent object is missing.
8461	0x0000210D	ERROR_DS_DRA_PREEMPTED	The replication operation was preempted.
8462	0x0000210E	ERROR_DS_DRA_ABANDON_SYNC	The replication synchronization attempt was abandoned because of a lack of updates.
8463	0x0000210F	ERROR_DS_DRA_SHUTDOWN	The replication operation was terminated because the system is shutting down.
8464	0x00002110	ERROR_DS_DRA_INCOMPATIBLE_PARTIAL_SET	The replication synchronization attempt failed as the destination partial attribute set is not a subset of source partial attribute set.
8465	0x00002111	ERROR_DS_DRA_SOURCE_IS_PARTIAL_REPLICA	The replication synchronization attempt failed because a master replica attempted to sync from a partial replica.
8466	0x00002112	ERROR_DS_DRA_EXTN_CONNECTION_FAILED	The server specified for this replication operation was contacted, but that server was unable to contact an additional server needed to complete the operation.
8467	0x00002113	ERROR_DS_INSTALL_SCHEMA_MISMATCH	The version of the Active Directory schema of the source forest is not compatible with the version of Active Directory on this computer. You must upgrade the operating system on a domain controller in the source forest before this computer can be added as a domain controller to that forest.
8468	0x00002114	ERROR_DS_DUP_LINK_ID	Schema update failed: An attribute with the same link identifier already exists.
8469	0x00002115	ERROR_DS_NAME_ERROR_RESOLVING	Name translation: Generic processing error.
8470	0x00002116	ERROR_DS_NAME_ERROR_NOT_FOUND	Name translation: Could not find the name or insufficient right to see name.
8471	0x00002117	ERROR_DS_NAME_ERROR_NOT_UNIQUE	Name translation: Input name mapped to more than one output name.
8472	0x00002118	ERROR_DS_NAME_ERROR_NO_MAPPING	Name translation: Input name found, but not the associated output format.
8473	0x00002119	ERROR_DS_NAME_ERROR_DOMAIN_ONLY	Name translation: Unable to resolve completely, only the domain was found.
8474	0x0000211A	ERROR_DS_NAME_ERROR_NO_SYNTACTICAL_MAPPING	Name translation: Unable to perform purely syntactical mapping at the client without going out to the wire.
8475	0x0000211B	ERROR_DS_CONSTRUCTED_ATT_MOD	Modification of a constructed att is not allowed.
8476	0x0000211C	ERROR_DS_WRONG_OM_OBJ_CLASS	The OM-Object-Class specified is incorrect for an attribute with the specified syntax.
8477	0x0000211D	ERROR_DS_DRA_REPL_PENDING	The replication request has been posted; waiting for reply.

Error			Description
decimal	Hexadecimal	Name	
8478	0x0000211E	ERROR_DS_DS_REQUIRED	The requested operation requires a directory service, and none was available.
8479	0x0000211F	ERROR_DS_INVALID_LDAP_DISPLAY_NAME	The LDAP display name of the class or attribute contains non-ASCII characters.
8480	0x00002120	ERROR_DS_NON_BASE_SEARCH	The requested search operation is only supported for base searches.
8481	0x00002121	ERROR_DS_CANT_RETRIEVE_ATTS	The search failed to retrieve attributes from the database.
8482	0x00002122	ERROR_DS_BACKLINK_WITHOUT_LINK	The schema update operation tried to add a backward link attribute that has no corresponding forward link.
8483	0x00002123	ERROR_DS_EPOCH_MISMATCH	Source and destination of a cross domain move do not agree on the object's epoch number. Either source or destination does not have the latest version of the object.
8484	0x00002124	ERROR_DS_SRC_NAME_MISMATCH	Source and destination of a cross domain move do not agree on the object's current name. Either source or destination does not have the latest version of the object.
8485	0x00002125	ERROR_DS_SRC_AND_DST_NC_IDENTICAL	Source and destination of a cross domain move operation are identical. Caller should use local move operation instead of cross domain move operation.
8486	0x00002126	ERROR_DS_DST_NC_MISMATCH	Source and destination for a cross domain move are not in agreement on the naming contexts in the forest. Either source or destination does not have the latest version of the Partitions container.
8487	0x00002127	ERROR_DS_NOT_AUTHORITIVE_FOR_DST_NC	Destination of a cross domain move is not authoritative for the destination naming context.
8488	0x00002128	ERROR_DS_SRC_GUID_MISMATCH	Source and destination of a cross domain move do not agree on the identity of the source object. Either source or destination does not have the latest version of the source object.
8489	0x00002129	ERROR_DS_CANT_MOVE_DELETED_OBJECT	Object being moved across domains is already known to be deleted by the destination server. The source server does not have the latest version of the source object.
8490	0x0000212A	ERROR_DS_PDC_OPERATION_IN_PROGRESS	Another operation which requires exclusive access to the PDC PSMO is already in progress.
8491	0x0000212B	ERROR_DS_CROSS_DOMAIN_CLEANUP_REQD	A cross domain move operation failed such that the two versions of the moved object exist - one each in the source and destination domains. The destination object needs to be removed to restore the system to a consistent state.
8492	0x0000212C	ERROR_DS_ILLEGAL_XDOM_MOVE_OPERATION	This object may not be moved across domain boundaries either because cross domain moves for this class are disallowed, or the object has some special characteristics, eg: trust account or restricted RID, which prevent its move.
8493	0x0000212D	ERROR_DS_CANT_WITH_ACCT_GROUP_MEMBERSHPS	Can't move objects with memberships across domain boundaries as once moved, this would violate the membership conditions of the account group. Remove the object from any account group memberships and retry.
8494	0x0000212E	ERROR_DS_NC_MUST_HAVE_NC_PARENT	A naming context head must be the immediate child of another naming context head, not of an interior node.
8495	0x0000212F	ERROR_DS_CR_IMPOSSIBLE_TO_VALIDATE	The directory cannot validate the proposed naming context name because it does not hold a replica of the naming context above the proposed naming context. Please ensure that the domain naming master role is held by a server that is configured as a global catalog server, and that the server is up to date with its replication partners. (Applies only to Windows 2000 Domain Naming masters)
8496	0x00002130	ERROR_DS_DST_DOMAIN_NOT_NATIVE	Destination domain must be in native mode.

Error			Description
decimal	Hexadecimal	Name	
8497	0x00002131	ERROR_DS_MISSING_INFRASTRUCTURE_CONTAINER	The operation can not be performed because the server does not have an infrastructure container in the domain of interest.
8498	0x00002132	ERROR_DS_CANT_MOVE_ACCOUNT_GROUP	Cross-domain move of non-empty account groups is not allowed.
8499	0x00002133	ERROR_DS_CANT_MOVE_RESOURCE_GROUP	Cross-domain move of non-empty resource groups is not allowed.

Error			Description
decimal	Hexadecimal	Name	
8500	0x00002134	ERROR_DS_INVALID_SEARCH_FLAG	The search flags for the attribute are invalid. The ANR bit is valid only on attributes of Unicode or Teletex strings.
8501	0x00002135	ERROR_DS_NO_TREE_DELETE_ABOVE_NC	Tree deletions starting at an object which has an NC head as a descendant are not allowed.
8502	0x00002136	ERROR_DS_COULDNT_LOCK_TREE_FOR_DELETE	The directory service failed to lock a tree in preparation for a tree deletion because the tree was in use.
8503	0x00002137	ERROR_DS_COULDNT_IDENTIFY_OBJECTS_FOR_TREE_DELETE	The directory service failed to identify the list of objects to delete while attempting a tree deletion.
8504	0x00002138	ERROR_DS_SAM_INIT_FAILURE	Security Accounts Manager initialization failed because of the following error: %1. Error Status: 0x%2. Click OK to shut down the system and reboot into Directory Services Restore Mode. Check the event log for detailed information.
8505	0x00002139	ERROR_DS_SENSITIVE_GROUP_VIOLATION	Only an administrator can modify the membership list of an administrative group.
8506	0x0000213A	ERROR_DS_CANT_MOD_PRIMARYGROUPID	Cannot change the primary group ID of a domain controller account.
8507	0x0000213B	ERROR_DS_ILLEGAL_BASE_SCHEMA_MOD	An attempt is made to modify the base schema.
8508	0x0000213C	ERROR_DS_NONSAFE_SCHEMA_CHANGE	Adding a new mandatory attribute to an existing class, deleting a mandatory attribute from an existing class, or adding an optional attribute to the special class Top that is not a backlink attribute (directly or through inheritance, for example, by adding or deleting an auxiliary class) is not allowed.
8509	0x0000213D	ERROR_DS_SCHEMA_UPDATE_DISALLOWED	Schema update is not allowed on this DC because the DC is not the schema FSMO Role Owner.
8510	0x0000213E	ERROR_DS_CANT_CREATE_UNDER_SCHEMA	An object of this class cannot be created under the schema container. You can only create attribute-schema and class-schema objects under the schema container.
8511	0x0000213F	ERROR_DS_INSTALL_NO_SRC_SCH_VERSION	The replica/child install failed to get the objectVersion attribute on the schema container on the source DC. Either the attribute is missing on the schema container or the credentials supplied do not have permission to read it.
8512	0x00002140	ERROR_DS_INSTALL_NO_SCH_VERSION_IN_INIFILE	The replica/child install failed to read the objectVersion attribute in the SCHEMA section of the file schema.ini in the system32 directory.
8513	0x00002141	ERROR_DS_INVALID_GROUP_TYPE	The specified group type is invalid.
8514	0x00002142	ERROR_DS_NO_NEST_GLOBALGROUP_IN_MIXEDDOMAIN	Cannot nest global groups in a mixed domain if the group is security-enabled.
8515	0x00002143	ERROR_DS_NO_NEST_LOCALGROUP_IN_MIXEDDOMAIN	Cannot nest local groups in a mixed domain if the group is security-enabled.
8516	0x00002144	ERROR_DS_GLOBAL_CANT_HAVE_LOCAL_MEMBER	A global group cannot have a local group as a member.
8517	0x00002145	ERROR_DS_GLOBAL_CANT_HAVE_UNIVERSAL_MEMBER	A global group cannot have a universal group as a member.
8518	0x00002146	ERROR_DS_UNIVERSAL_CANT_HAVE_LOCAL_MEMBER	A universal group cannot have a local group as a member.
8519	0x00002147	ERROR_DS_GLOBAL_CANT_HAVE_CROSSDOMAIN_MEMBER	A global group cannot have a cross-domain member.
8520	0x00002148	ERROR_DS_LOCAL_CANT_HAVE_CROSSDOMAIN_LOCAL_MEMBER	A local group cannot have another cross-domain local group as a member.
8521	0x00002149	ERROR_DS_HAVE_PRIMARY_MEMBERS	A group with primary members cannot change to a security-disabled group.
8522	0x0000214A	ERROR_DS_STRING_SD_CONVERSION_FAILED	The schema cache load failed to convert the string default SD on a class-schema object.
8523	0x0000214B	ERROR_DS_NAMING_MASTER_GC	Only DSAs configured to be Global Catalog servers should be allowed to hold the Domain Naming Master FSMO role. (Applies only to Windows 2000 servers)
8524	0x0000214C	ERROR_DS_LOOKUP_FAILURE	The DSA operation is unable to proceed because of a DNS lookup failure.

Error			Description
decimal	Hexadecimal	Name	
8525	0x0000214D	ERROR_DS_COULDNT_UPDATE_SPNS	While processing a change to the DNS Host Name for an object, the Service Principal Name values could not be kept in sync.
8526	0x0000214E	ERROR_DS_CANT_RETRIEVE_SD	The Security Descriptor attribute could not be read.
8527	0x0000214F	ERROR_DS_KEY_NOT_UNIQUE.	The object requested was not found, but an object with that key was found.
8528	0x00002150	ERROR_DS_WRONG_LINKED_ATT_SYNTAX	The syntax of the linked attributed being added is incorrect. Forward links can only have syntax 2.5.5.1, 2.5.5.7, and 2.5.5.14, and backlinks can only have syntax 2.5.5.1.
8529	0x00002151	ERROR_DS_SAM_NEED_BOOTKEY_PASSWORD	Security Account Manager needs to get the boot password.
8530	0x00002152	ERROR_DS_SAM_NEED_BOOTKEY_FLOPPY	Security Account Manager needs to get the boot key from floppy disk.
8531	0x00002153	ERROR_DS_CANT_START	Directory Service cannot start.
8532	0x00002154	ERROR_DS_INIT_FAILURE	Directory Services could not start.
8533	0x00002155	ERROR_DS_NO_PKT_PRIVACY_ON_CONNECTION	The connection between client and server requires packet privacy or better.
8534	0x00002156	ERROR_DS_SOURCE_DOMAIN_IN_FOREST	The source domain may not be in the same forest as destination.
8535	0x00002157	ERROR_DS_DESTINATION_DOMAIN_NOT_IN_FOREST	The destination domain must be in the forest.
8536	0x00002158	ERROR_DS_DESTINATION_AUDITING_NOT_ENABLED	The operation requires that destination domain auditing be enabled.
8537	0x00002159	ERROR_DS_CANT_FIND_DC_FOR_SRC_DOMAIN	The operation couldn't locate a DC for the source domain.
8538	0x0000215A	ERROR_DS_SRC_OBJ_NOT_GROUP_OR_USER	The source object must be a group or user.
8539	0x0000215B	ERROR_DS_SRC_SID_EXISTS_IN_FOREST	The source object's SID already exists in destination forest.
8540	0x0000215C	ERROR_DS_SRC_AND_DST_OBJECT_CLASS_MISMATCH	The source and destination object must be of the same type.
8541	0x0000215D	ERROR_SAM_INIT_FAILURE	Security Accounts Manager initialization failed because of the following error: %1. Error Status: 0x%2. Click OK to shut down the system and reboot into Safe Mode. Check the event log for detailed information.
8542	0x0000215E	ERROR_DS_DRA_SCHEMA_INFO_SHIP	Schema information could not be included in the replication request.
8543	0x0000215F	ERROR_DS_DRA_SCHEMA_CONFLICT	The replication operation could not be completed due to a schema incompatibility.
8544	0x00002160	ERROR_DS_DRA_EARLIER_SCHEMA_CONLICT	The replication operation could not be completed due to a previous schema incompatibility.
8545	0x00002161	ERROR_DS_DRA_OBJ_NC_MISMATCH	The replication update could not be applied because either the source or the destination has not yet received information regarding a recent cross-domain move operation.
8546	0x00002162	ERROR_DS_NC_STILL_HAS_DSAS	The requested domain could not be deleted because there exist domain controllers that still host this domain.
8547	0x00002163	ERROR_DS_GC_REQUIRED	The requested operation can be performed only on a global catalog server.
8548	0x00002164	ERROR_DS_LOCAL_MEMBER_OF_LOCAL_ONLY	A local group can only be a member of other local groups in the same domain.
8549	0x00002165	ERROR_DS_NO_FPO_IN_UNIVERSAL_GROUPS	Foreign security principals cannot be members of universal groups.
8550	0x00002166	ERROR_DS_CANT_ADD_TO_GC	The attribute is not allowed to be replicated to the GC because of security reasons.
8551	0x00002167	ERROR_DS_NO_CHECKPOINT_WITH_PDC	The checkpoint with the PDC could not be taken because there are too many modifications being processed currently.
8552	0x00002168	ERROR_DS_SOURCE_AUDITING_NOT_ENABLED	The operation requires that source domain auditing be enabled.
8553	0x00002169	ERROR_DS_CANT_CREATE_IN_NONDOMAIN_NC	Security principal objects can only be created inside domain naming contexts.

Error			Description
decimal	Hexadecimal	Name	
8554	0x0000216A	ERROR_DS_INVALID_NAME_FOR_SPN	A Service Principal Name (SPN) could not be constructed because the provided hostname is not in the necessary format.
8555	0x0000216B	ERROR_DS_FILTER_USES_CONTRUCTED_ATTRS	A Filter was passed that uses constructed attributes.
8556	0x0000216C	ERROR_DS_UNICODEPWD_NOT_IN_QUOTES	The unicodePwd attribute value must be enclosed in double quotes.
8557	0x0000216D	ERROR_DS_MACHINE_ACCOUNT_QUOTA_EXCEEDED	Your computer could not be joined to the domain. You have exceeded the maximum number of computer accounts you are allowed to create in this domain. Contact your system administrator to have this limit reset or increased.
8558	0x0000216E	ERROR_DS_MUST_BE_RUN_ON_DST_DC	For security reasons, the operation must be run on the destination DC.
8559	0x0000216F	ERROR_DS_SRC_DC_MUST_BE_SP4_OR_GREATER	For security reasons, the source DC must be NT4SP4 or greater.
8560	0x00002170	ERROR_DS_CANT_TREE_DELETE_CRITICAL_OBJ	Critical Directory Service System objects cannot be deleted during tree delete operations. The tree delete may have been partially performed.
8561	0x00002171	ERROR_DS_INIT_FAILURE_CONSOLE	Directory Services could not start because of the following error: %1. Error Status: 0x%2. Please click OK to shutdown the system. You can use the recovery console to diagnose the system further.
8562	0x00002172	ERROR_DS_SAM_INIT_FAILURE_CONSOLE	Security Accounts Manager initialization failed because of the following error: %1. Error Status: 0x%2. Please click OK to shutdown the system. You can use the recovery console to diagnose the system further.
8563	0x00002173	ERROR_DS_FOREST_VERSION_TOO_HIGH	This version of Windows is too old to support the current directory forest behavior. You must upgrade the operating system on this server before it can become a domain controller in this forest.
8564	0x00002174	ERROR_DS_DOMAIN_VERSION_TOO_HIGH	This version of Windows is too old to support the current domain behavior. You must upgrade the operating system on this server before it can become a domain controller in this domain.
8565	0x00002175	ERROR_DS_FOREST_VERSION_TOO_LOW	This version of Windows no longer supports the behavior version in use in this directory forest. You must advance the forest behavior version before this server can become a domain controller in the forest.
8566	0x00002176	ERROR_DS_DOMAIN_VERSION_TOO_LOW	This version of Windows no longer supports the behavior version in use in this domain. You must advance the domain behavior version before this server can become a domain controller in the domain.
8567	0x00002177	ERROR_DS_INCOMPATIBLE_VERSION	The version of Windows is incompatible with the behavior version of the domain or forest.
8568	0x00002178	ERROR_DS_LOW_DSA_VERSION	The behavior version cannot be increased to the requested value because Domain Controllers still exist with versions lower than the requested value.
8569	0x00002179	ERROR_DS_NO_BEHAVIOR_VERSION_IN_MIXEDDOMAIN	The behavior version value cannot be increased while the domain is still in mixed domain mode. You must first change the domain to native mode before increasing the behavior version.
8570	0x0000217A	ERROR_DS_NOT_SUPPORTED_SORT_ORDER	The sort order requested is not supported.
8571	0x0000217B	ERROR_DS_NAME_NOT_UNIQUE	Found an object with a non unique name.
8572	0x0000217C	ERROR_DS_MACHINE_ACCOUNT_CREATED_PRENT4	The machine account was created pre-NT4. The account needs to be recreated.
8573	0x0000217D	ERROR_DS_OUT_OF_VERSION_STORE	The database is out of version store.
8574	0x0000217E	ERROR_DS_INCOMPATIBLE_CONTROLS_USED	Unable to continue operation because multiple conflicting controls were used.
8575	0x0000217F	ERROR_DS_NO_REF_DOMAIN	Unable to find a valid security descriptor reference domain for this partition.

Error			Description
decimal	Hexadecimal	Name	
8576	0x00002180	ERROR_DS_RESERVED_LINK_ID	Schema update failed: The link identifier is reserved.
8577	0x00002181	ERROR_DS_LINK_ID_NOT_AVAILABLE	Schema update failed: There are no link identifiers available.
8578	0x00002182	ERROR_DS_AG_CANT_HAVE_UNIVERSAL_MEMBER	An account group can not have a universal group as a member.
8579	0x00002183	ERROR_DS_MODIFYDN_DISALLOWED_BY_INSTANCE_TYPE	Rename or move operations on naming context heads or read-only objects are not allowed.
8580	0x00002184	ERROR_DS_NO_OBJECT_MOVE_IN_SCHEMA_NC	Move operations on objects in the schema naming context are not allowed.
8581	0x00002185	ERROR_DS_MODIFYDN_DISALLOWED_BY_FLAG	A system flag has been set on the object and does not allow the object to be moved or renamed.
8582	0x00002186	ERROR_DS_MODIFYDN_WRONG_GRANDPARENT	This object is not allowed to change its grandparent container. Moves are not forbidden on this object, but are restricted to sibling containers.
8583	0x00002187	ERROR_DS_NAME_ERROR_TRUST_REFERRAL	Unable to resolve completely, a referral to another forest is generated.
8584	0x00002188	ERROR_NOT_SUPPORTED_ON_STANDARD_SERVER	The requested action is not supported on standard server.
8585	0x00002189	ERROR_DS_CANT_ACCESS_REMOTE_PART_OF_AD	Could not access a partition of the Active Directory located on a remote server. Make sure at least one server is running for the partition in question.
8586	0x0000218A	ERROR_DS_CR_IMPOSSIBLE_TO_VALIDATE_V2	The directory cannot validate the proposed naming context (or partition) name because it does not hold a replica nor can it contact a replica of the naming context above the proposed naming context. Please ensure that the parent naming context is properly registered in DNS, and at least one replica of this naming context is reachable by the Domain Naming master.
8587	0x0000218B	ERROR_DS_THREAD_LIMIT_EXCEEDED	The thread limit for this request was exceeded.
8588	0x0000218C	ERROR_DS_NOT_CLOSEST	The Global catalog server is not in the closet site.

Error			Description
decimal	Hexadecimal	Name	
9001	0x00002329	DNS_ERROR_RCODE_FORMAT_ERROR	DNS server unable to interpret format.
9002	0x0000232A	DNS_ERROR_RCODE_SERVER_FAILURE	DNS server failure.
9003	0x0000232B	DNS_ERROR_RCODE_NAME_ERROR	DNS name does not exist.
9004	0x0000232C	DNS_ERROR_RCODE_NOT_IMPLEMENTED	DNS request not supported by name server.
9005	0x0000232D	DNS_ERROR_RCODE_REFUSED	DNS operation refused.
9006	0x0000232E	DNS_ERROR_RCODE_YXDOMAIN	DNS name that ought not exist, does exist.
9007	0x0000232F	DNS_ERROR_RCODE_YXRRSET	DNS RR set that ought not exist, does exist.
9008	0x00002330	DNS_ERROR_RCODE_NXRRSET	DNS RR set that ought to exist, does not exist.
9009	0x00002331	DNS_ERROR_RCODE_NOTAUTH	DNS server not authoritative for zone.
9010	0x00002332	DNS_ERROR_RCODE_NOTZONE	DNS name in update or prereq is not in zone.
9016	0x00002338	DNS_ERROR_RCODE_BADSIG	DNS signature failed to verify.
9017	0x00002339	DNS_ERROR_RCODE_BADKEY	DNS bad key.
9018	0x0000233A	DNS_ERROR_RCODE_BADTIME	DNS signature validity expired.
9501	0x0000251D	DNS_INFO_NO_RECORDS	No records found for given DNS query.
9502	0x0000251E	DNS_ERROR_BAD_PACKET	Bad DNS packet.
9503	0x0000251F	DNS_ERROR_NO_PACKET	No DNS packet.
9504	0x00002520	DNS_ERROR_RCODE	DNS error, check rcode.
9505	0x00002521	DNS_ERROR_UNSECURE_PACKET	Unsecured DNS packet.
9551	0x0000254F	DNS_ERROR_INVALID_TYPE	Invalid DNS type.
9552	0x00002550	DNS_ERROR_INVALID_IP_ADDRESS	Invalid IP address.
9553	0x00002551	DNS_ERROR_INVALID_PROPERTY	Invalid property.
9554	0x00002552	DNS_ERROR_TRY_AGAIN_LATER	Try DNS operation again later.
9555	0x00002553	DNS_ERROR_NOT_UNIQUE	Record for given name and type is not unique.
9556	0x00002554	DNS_ERROR_NON_RFC_NAME	DNS name does not comply with RFC specifications.
9557	0x00002555	DNS_STATUS_FQDN	DNS name is a fully-qualified DNS name.
9558	0x00002556	DNS_STATUS_DOTTED_NAME	DNS name is dotted (multi-label).
9559	0x00002557	DNS_STATUS_SINGLE_PART_NAME	DNS name is a single-part name.
9560	0x00002558	DNS_ERROR_INVALID_NAME_CHAR	DSN name contains an invalid character.
9561	0x00002559	DNS_ERROR_NUMERIC_NAME	DNS name is entirely numeric.
9601	0x00002581	DNS_ERROR_ZONE_DOES_NOT_EXIST	DNS zone does not exist.
9602	0x00002582	DNS_ERROR_NO_ZONE_INFO	DNS zone information not available.
9603	0x00002583	DNS_ERROR_INVALID_ZONE_OPERATION	Invalid operation for DNS zone.
9604	0x00002584	DNS_ERROR_ZONE_CONFIGURATION_ERROR	Invalid DNS zone configuration.
9605	0x00002585	DNS_ERROR_ZONE_HAS_NO_SOA_RECORD	DNS zone has no start of authority (SOA) record.
9606	0x00002586	DNS_ERROR_ZONE_HAS_NO_NS_RECORDS	DNS zone has no name server (NS) record.
9607	0x00002587	DNS_ERROR_ZONE_LOCKED	DNS zone is locked.
9608	0x00002588	DNS_ERROR_ZONE_CREATION_FAILED	DNS zone creation failed.
9609	0x00002589	DNS_ERROR_ZONE_ALREADY_EXISTS	DNS zone already exists.
9610	0x0000258A	DNS_ERROR_AUTOZONE_ALREADY_EXISTS	DNS automatic zone already exists.
9611	0x0000258B	DNS_ERROR_INVALID_ZONE_TYPE	Invalid DNS zone type.
9612	0x0000258C	DNS_ERROR_SECONDARY_REQUIRES_MASTER_IP	Secondary DNS zone requires master IP address.
9613	0x0000258D	DNS_ERROR_ZONE_NOT_SECONDARY	DNS zone not secondary.
9614	0x0000258E	DNS_ERROR_NEED_SECONDARY_ADDRESSES	Need secondary IP address.
9615	0x0000258F	DNS_ERROR_WINS_INIT_FAILED	WINS initialization failed.
9616	0x00002590	DNS_ERROR_NEED_WINS_SERVERS	Need WINS servers.
9617	0x00002591	DNS_ERROR_NBSTAT_INIT_FAILED	NBTSTAT initialization call failed.
9618	0x00002592	DNS_ERROR_SOA_DELETE_INVALID	Invalid delete of start of authority (SOA)
9619	0x00002593	DNS_ERROR_FORWARDER_ALREADY_EXISTS	A conditional forwarding zone already exists for that name.
9651	0x000025B3	DNS_ERROR_PRIMARY_REQUIRES_DATAFILE	Primary DNS zone requires datafile.
9652	0x000025B4	DNS_ERROR_INVALID_DATAFILE_NAME	Invalid datafile name for DNS zone.
9653	0x000025B5	DNS_ERROR_DATAFILE_OPEN_FAILURE	Failed to open datafile for DNS zone.
9654	0x000025B6	DNS_ERROR_FILE_WRITEBACK_FAILED	Failed to write datafile for DNS zone.
9655	0x000025B7	DNS_ERROR_DATAFILE_PARSING	Failure while reading datafile for DNS zone.
9701	0x000025E5	DNS_ERROR_RECORD_DOES_NOT_EXIST	DNS record does not exist.
9702	0x000025E6	DNS_ERROR_RECORD_FORMAT	DNS record format error.

Error			Description
decimal	Hexadecimal	Name	
9703	0x000025E7	DNS_ERROR_NODE_CREATION_FAILED	Node creation failure in DNS.
9704	0x000025E8	DNS_ERROR_UNKNOWN_RECORD_TYPE	Unknown DNS record type.
9705	0x000025E9	DNS_ERROR_RECORD_TIMED_OUT	DNS record timed out.
9706	0x000025EA	DNS_ERROR_NAME_NOT_IN_ZONE	Name not in DNS zone.
9707	0x000025EB	DNS_ERROR_CNAME_LOOP	CNAME loop detected.
9708	0x000025EC	DNS_ERROR_NODE_IS_CNAME	Node is a CNAME DNS record.
9709	0x000025ED	DNS_ERROR_CNAME_COLLISION	A CNAME record already exists for given name.
9710	0x000025EE	DNS_ERROR_RECORD_ONLY_AT_ZONE_ROOT	Record only at DNS zone root.
9711	0x000025EF	DNS_ERROR_RECORD_ALREADY_EXISTS	DNS record already exists.
9712	0x000025F0	DNS_ERROR_SECONDARY_DATA	Secondary DNS zone data error.
9713	0x000025F1	DNS_ERROR_NO_CREATE_CACHE_DATA	Could not create DNS cache data.
9714	0x000025F2	DNS_ERROR_NAME_DOES_NOT_EXIST	DNS name does not exist.
9715	0x000025F3	DNS_WARNING_PTR_CREATE_FAILED	Could not create pointer (PTR) record.
9716	0x000025F4	DNS_WARNING_DOMAIN_UNDELETED	DNS domain was undeleted.
9717	0x000025F5	DNS_ERROR_DS_UNAVAILABLE	The directory service is unavailable.
9718	0x000025F6	DNS_ERROR_DS_ZONE_ALREADY_EXISTS	DNS zone already exists in the directory service.
9719	0x000025F7	DNS_ERROR_NO_BOOTFILE_IF_DS_ZONE	DNS server not creating or reading the boot file for the directory service integrated DNS zone.
9751	0x00002617	DNS_INFO_AXFR_COMPLETE	DNS AXFR (zone transfer) complete.
9752	0x00002618	DNS_ERROR_AXFR	DNS zone transfer failed.
9753	0x00002619	DNS_INFO_ADDED_LOCAL_WINS	Added local WINS server.
9801	0x00002649	DNS_STATUS_CONTINUE_NEEDED	Secure update call needs to continue update request.
9851	0x0000267B	DNS_ERROR_NO_TCPIP	TCP/IP network protocol not installed.
9852	0x0000267C	DNS_ERROR_NO_DNS_SERVERS	No DNS servers configured for local system.
9901	0x000026AD	DNS_ERROR_DP_DOES_NOT_EXIST	The specified directory partition does not exist.
9902	0x000026AE	DNS_ERROR_DP_ALREADY_EXISTS	The specified directory partition already exists.
9903	0x000026AF	DNS_ERROR_DP_NOT_ENLISTED	The DS is not enlisted in the specified directory partition.
9904	0x000026B0	DNS_ERROR_DP_ALREADY_ENLISTED	The DS is already enlisted in the specified directory partition.

Error			Description
decimal	Hexadecimal	Name	
10004	0x00002714	WSAEINTR	A blocking operation was interrupted by a call to WSACancelBlockingCall.
10009	0x00002719	WSAEBADF	The file handle supplied is not valid.
10013	0x0000271D	WSAEACCES	An attempt was made to access a socket in a way forbidden by its access permissions.
10014	0x0000271E	WSAEFAULT	The system detected an invalid pointer address in attempting to use a pointer argument in a call.
10022	0x00002726	WSAEINVAL	An invalid argument was supplied.
10024	0x00002728	WSAEMFILE	Too many open sockets.
10035	0x00002733	WSAEWOULDBLOCK	A non-blocking socket operation could not be completed immediately.
10036	0x00002734	WSAEINPROGRESS	A blocking operation is currently executing.
10037	0x00002735	WSAEALREADY	An operation was attempted on a non-blocking socket that already had an operation in progress.
10038	0x00002736	WSAENOTSOCK	An operation was attempted on something that is not a socket.
10039	0x00002737	WSAEDESTADDRREQ	A required address was omitted from an operation on a socket.
10040	0x00002738	WSAEMSGSIZE	A message sent on a datagram socket was larger than the internal message buffer or some other network limit, or the buffer used to receive a datagram into was smaller than the datagram itself.
10041	0x00002739	WSAEPROTOTYPE	A protocol was specified in the socket function call that does not support the semantics of the socket type requested.
10042	0x0000273A	WSAENOPROTOOPT	An unknown, invalid, or unsupported option or level was specified in a getsockopt or setsockopt call.
10043	0x0000273B	WSAEPROTONOSUPPORT	The requested protocol has not been configured into the system, or no implementation for it exists.
10044	0x0000273C	WSAESOCKTNOSUPPORT	The support for the specified socket type does not exist in this address family.
10045	0x0000273D	WSAEOPNOTSUPP	The attempted operation is not supported for the type of object referenced.
10046	0x0000273E	WSAEPFNOSUPPORT	The protocol family has not been configured into the system or no implementation for it exists.
10047	0x0000273F	WSAEAFNOSUPPORT	An address incompatible with the requested protocol was used.
10048	0x00002740	WSAEADDRINUSE	Only one usage of each socket address (protocol/ network address/port) is normally permitted.
10049	0x00002741	WSAEADDRNOTAVAIL	The requested address is not valid in its context.
10050	0x00002742	WSAENETDOWN	A socket operation encountered a dead network.
10051	0x00002743	WSAENETUNREACH	A socket operation was attempted to an unreachable network.
10052	0x00002744	WSAENETRESET	The connection has been broken due to keep-alive activity detecting a failure while the operation was in progress.
10053	0x00002745	WSAECONNABORTED	An established connection was aborted by the software in your host machine.
10054	0x00002746	WSAECONNRESET	An existing connection was forcibly closed by the remote host.
10055	0x00002747	WSAENOBUFS	An operation on a socket could not be performed because the system lacked sufficient buffer space or because a queue was full.
10056	0x00002748	WSAEISCONN	A connect request was made on an already connected socket.
10057	0x00002749	WSAENOTCONN	A request to send or receive data was disallowed because the socket is not connected and (when sending on a datagram socket using a sendto call) no address was supplied.
10058	0x0000274A	WSAESHUTDOWN	A request to send or receive data was disallowed because the socket had already been shut down in that direction with a previous shutdown call.
10059	0x0000274B	WSAETOOMANYREFS	Too many references to some kernel object.

Error			Description
decimal	Hexadecimal	Name	
10060	0x0000274C	WSAETIMEDOUT	A connection attempt failed because the connected party did not properly respond after a period of time, or established connection failed because connected host has failed to respond.
10061	0x0000274D	WSAECONNREFUSED	No connection could be made because the target machine actively refused it.
10062	0x0000274E	WSAELOOP	Cannot translate name.
10063	0x0000274F	WSAENAMETOOLONG	Name component or name was too long.
10064	0x00002750	WSAEHOSTDOWN	A socket operation failed because the destination host was down.
10065	0x00002751	WSAEHOSTUNREACH	A socket operation was attempted to an unreachable host.
10066	0x00002752	WSAENOTEMPTY	Cannot remove a directory that is not empty.
10067	0x00002753	WSAEPROCLIM	A Windows Sockets implementation may have a limit on the number of applications that may use it simultaneously.
10068	0x00002754	WSAEUSERS	Ran out of quota.
10069	0x00002755	WSAEDQUOT	Ran out of disk quota.
10070	0x00002756	WSAESTALE	File handle reference is no longer available.
10071	0x00002757	WSAEREMOTE	Item is not available locally.
10091	0x0000276B	WSASYSNOTREADY	WSAStartup cannot function at this time because the underlying system it uses to provide network services is currently unavailable.
10092	0x0000276C	WSAVERNOTSUPPORTED	The Windows Sockets version requested is not supported.
10093	0x0000276D	WSANOTINITIALISED	Either the application has not called WSAStartup, or WSAStartup failed.
10101	0x00002775	WSAEDISCON	Returned by WSARecv or WSARecvFrom to indicate the remote party has initiated a graceful shutdown sequence.
10102	0x00002776	WSAENOMORE	No more results can be returned by WSALookupServiceNext.
10103	0x00002777	WSAECANCELLED	A call to WSALookupServiceEnd was made while this call was still processing. The call has been canceled.
10104	0x00002778	WSAEINVALIDPROCTABLE	The procedure call table is invalid.
10105	0x00002779	WSAEINVALIDPROVIDER	The requested service provider is invalid.
10106	0x0000277A	WSAEPROVIDERFAILEDINIT	The requested service provider could not be loaded or initialized.
10107	0x0000277B	WSASYSCALLFAILURE	A system call that should never fail has failed.
10108	0x0000277C	WSASERVICE_NOT_FOUND	No such service is known. The service cannot be found in the specified name space.
10109	0x0000277D	WSATYPE_NOT_FOUND	The specified class was not found.
10110	0x0000277E	WSA_E_NO_MORE	No more results can be returned by WSALookupServiceNext.
10111	0x0000277F	WSA_E_CANCELLED	A call to WSALookupServiceEnd was made while this call was still processing. The call has been canceled.
10112	0x00002780	WSAEREFUSED	A database query failed because it was actively refused.
11001	0x00002AF9	WSAHOST_NOT_FOUND	No such host is known.
11002	0x00002AFA	WSATRY_AGAIN	This is usually a temporary error during hostname resolution and means that the local server did not receive a response from an authoritative server.
11003	0x00002AFB	WSANO_RECOVERY	A non-recoverable error occurred during a database lookup.
11004	0x00002AFC	WSANO_DATA	The requested name is valid and was found in the database, but it does not have the correct associated data being resolved for.
11005	0x00002AFD	WSA_QOS_RECEIVERS	At least one reserve has arrived.
11006	0x00002AFE	WSA_QOS_SENDERS	At least one path has arrived.
11007	0x00002AFF	WSA_QOS_NO_SENDERS	There are no senders.
11008	0x00002B00	WSA_QOS_NO_RECEIVERS	There are no receivers.
11009	0x00002B01	WSA_QOS_REQUEST_CONFIRMED	Reserve has been confirmed.

Error			Description
decimal	Hexadecimal	Name	
11010	0x00002B02	WSA_QOS_ADMISSION_FAILURE	Error due to lack of resources.
11011	0x00002B03	WSA_QOS_POLICY_FAILURE	Rejected for administrative reasons - bad credentials.
11012	0x00002B04	WSA_QOS_BAD_STYLE	Unknown or conflicting style.
11013	0x00002B05	WSA_QOS_BAD_OBJECT	Problem with some part of the filterspec or providerspecific buffer in general.
11014	0x00002B06	WSA_QOS_TRAFFIC_CTRL_ERROR	Problem with some part of the flowspec.
11015	0x00002B07	WSA_QOS_GENERIC_ERROR	General QOS error.
11016	0x00002B08	WSA_QOS_ESERVICETYPE	An invalid or unrecognized service type was found in the flowspec.
11017	0x00002B09	WSA_QOS_EFLOWSPEC	An invalid or inconsistent flowspec was found in the QOS structure.
11018	0x00002B0A	WSA_QOS_EPROVSPECBUF	Invalid QOS provider-specific buffer.
11019	0x00002B0B	WSA_QOS_EFILTERSTYLE	An invalid QOS filter style was used.
11020	0x00002B0C	WSA_QOS_EFILTERTYPE	An invalid QOS filter type was used.
11021	0x00002B0D	WSA_QOS_EFILTERCOUNT	An incorrect number of QOS FILTERSPECs were specified in the FLOWDESCRIPTOR.
11022	0x00002B0E	WSA_QOS_EOBJLENGTH	An object with an invalid ObjectLength field was specified in the QOS provider-specific buffer.
11023	0x00002B0F	WSA_QOS_EFLOWCOUNT	An incorrect number of flow descriptors was specified in the QOS structure.
11024	0x00002B10	WSA_QOS_EUNKNOWNPSOBJ	An unrecognized object was found in the QOS provider-specific buffer.
11025	0x00002B11	WSA_QOS_EPOLICYOBJ	An invalid policy object was found in the QOS provider-specific buffer.
11026	0x00002B12	WSA_QOS_EFLOWDESC	An invalid QOS flow descriptor was found in the flow descriptor list.
11027	0x00002B13	WSA_QOS_EPSFLOWSPEC	An invalid or inconsistent flowspec was found in the QOS provider-specific buffer.
11028	0x00002B14	WSA_QOS_EPSFILTERSPEC	An invalid FILTERSPEC was found in the QOS provider-specific buffer.
11029	0x00002B15	WSA_QOS_ESDMODEOBJ	An invalid shape discard mode object was found in the QOS provider-specific buffer.
11030	0x00002B16	WSA_QOS_ESHAPERATEOBJ	An invalid shaping rate object was found in the QOS provider-specific buffer.
11031	0x00002B17	WSA_QOS_RESERVED_PETYPE	A reserved policy element was found in the QOS provider-specific buffer.

Error			Description
decimal	Hexadecimal	Name	
12000	0x00002EE0	ERROR_SXS_SECTION_NOT_FOUND	The requested section was not present in the activation context.
12001	0x00002EE1	ERROR_SXS_CANT_GEN_ACTCTX	This application has failed to start because the application configuration is incorrect. Reinstalling the application may fix this problem.
12002	0x00002EE2	ERROR_SXS_INVALID_ACTCTXDATA_FORMAT	The application binding data format is invalid.
12003	0x00002EE3	ERROR_SXS_ASSEMBLY_NOT_FOUND	The referenced assembly is not installed on your system.
12004	0x00002EE4	ERROR_SXS_MANIFEST_FORMAT_ERROR	The manifest file does not begin with the required tag and format information.
12005	0x00002EE5	ERROR_SXS_MANIFEST_PARSE_ERROR	The manifest file contains one or more syntax errors.
12006	0x00002EE6	ERROR_SXS_ACTIVATION_CONTEXT_DISABLED	The application attempted to activate a disabled activation context.
12007	0x00002EE7	ERROR_SXS_KEY_NOT_FOUND	The requested lookup key was not found in any active activation context.
12008	0x00002EE8	ERROR_SXS_VERSION_CONFLICT	A component version required by the application conflicts with another component version already active.
12009	0x00002EE9	ERROR_SXS_WRONG_SECTION_TYPE	The type requested activation context section does not match the query API used.
12010	0x00002EEA	ERROR_SXS_THREAD_QUERIES_DISABLED	Lack of system resources has required isolated activation to be disabled for the current thread of execution.
12011	0x00002EEB	ERROR_SXS_PROCESS_DEFAULT_ALREADY_SET	An attempt to set the process default activation context failed because the process default activation context was already set.
12012	0x00002EEC	ERROR_SXS_UNKNOWN_ENCODING_GROUP	The encoding group identifier specified is not recognized.
12013	0x00002EED	ERROR_SXS_UNKNOWN_ENCODING	The encoding requested is not recognized.
12014	0x00002EEE	ERROR_SXS_INVALID_XML_NAMESPACE_URI	The manifest contains a reference to an invalid URI.
12015	0x00002EEF	ERROR_SXS_ROOT_MANIFEST_DEPENDENCY_NOT_INSTALLED	The application manifest contains a reference to a dependent assembly which is not installed.
12016	0x00002EF0	ERROR_SXS_LEAF_MANIFEST_DEPENDENCY_NOT_INSTALLED	The manifest for an assembly used by the application has a reference to a dependent assembly which is not installed.
12017	0x00002EF1	ERROR_SXS_INVALID_ASSEMBLY_IDENTITY_ATTRIBUTE	The manifest contains an attribute for the assembly identity which is not valid.
12018	0x00002EF2	ERROR_SXS_MANIFEST_MISSING_REQUIRED_DEFAULT_NAMESPACE	The manifest is missing the required default namespace specification on the assembly element.
12019	0x00002EF3	ERROR_SXS_MANIFEST_INVALID_REQUIRED_DEFAULT_NAMESPACE	The manifest has a default namespace specified on the assembly element but its value is not "urn:schemas-microsoft-com:asm.v1".
12020	0x00002EF4	ERROR_SXS_PRIVATE_MANIFEST_CROSS_PATH_WITH_REPARSE_POINT	The private manifest probe has crossed the reparse-point-associated path.
12021	0x00002EF5	ERROR_SXS_DUPLICATE_DLL_NAME	Two or more components referenced directly or indirectly by the application manifest have files by the same name.
12022	0x00002EF6	ERROR_SXS_DUPLICATE_WINDOWCLASS_NAME	Two or more components referenced directly or indirectly by the application manifest have window classes with the same name.
12023	0x00002EF7	ERROR_SXS_DUPLICATE_CLSID	Two or more components referenced directly or indirectly by the application manifest have the same COM server CLSIDs.
12024	0x00002EF8	ERROR_SXS_DUPLICATE_IID	Two or more components referenced directly or indirectly by the application manifest have proxies for the same COM interface IIDs.
12025	0x00002EF9	ERROR_SXS_DUPLICATE_TLBID	Two or more components referenced directly or indirectly by the application manifest have the same COM type library TLBIDs.
12026	0x00002EFA	ERROR_SXS_DUPLICATE_PROGID	Two or more components referenced directly or indirectly by the application manifest have the same COM ProgIDs.

Error			Description
decimal	Hexadecimal	Name	
12027	0x00002EFB	ERROR_SXS_DUPLICATE_ASSEMBLY_NAME	Two or more components referenced directly or indirectly by the application manifest are different versions of the same component which is not permitted.
12028	0x00002EFC	ERROR_SXS_FILE_HASH_MISMATCH	A component's file does not match the verification information present in the component manifest.
12029	0x00002EFD	ERROR_SXS_POLICY_PARSE_ERROR	The policy manifest contains one or more syntax errors.
12030	0x00002EFE	ERROR_SXS_XML_E_MISSINGQUOTE	Manifest Parse Error : A string literal was expected, but no opening quote character was found.
12031	0x00002EFF	ERROR_SXS_XML_E_COMMENTSYNTAX	Manifest Parse Error : Incorrect syntax was used in a comment.
12032	0x00002F00	ERROR_SXS_XML_E_BADSTARTNAMECHAR	Manifest Parse Error : A name was started with an invalid character.
12033	0x00002F01	ERROR_SXS_XML_E_BADNAMECHAR	Manifest Parse Error : A name contained an invalid character.
12034	0x00002F02	ERROR_SXS_XML_E_BADCHARINSTRING	Manifest Parse Error : A string literal contained an invalid character.
12035	0x00002F03	ERROR_SXS_XML_E_XMLDECLSYNTAX	Manifest Parse Error : Invalid syntax for an XML declaration.
12036	0x00002F04	ERROR_SXS_XML_E_BADCHARDATA	Manifest Parse Error : An invalid character was found in text content.
12037	0x00002F05	ERROR_SXS_XML_E_MISSINGWHITESPACE	Manifest Parse Error : Required white space was missing.
12038	0x00002F06	ERROR_SXS_XML_E_EXPECTINGTAGEND	Manifest Parse Error : The character '>' was expected.
12039	0x00002F07	ERROR_SXS_XML_E_MISSINGSEMICOLON	Manifest Parse Error : A semi colon character was expected.
12040	0x00002F08	ERROR_SXS_XML_E_UNBALANCEDPAREN	Manifest Parse Error : Unbalanced parentheses.
12041	0x00002F09	ERROR_SXS_XML_E_INTERNALERROR	Manifest Parse Error : Internal error.
12042	0x00002F0A	ERROR_SXS_XML_E_UNEXPECTED_WHITESPACE	Manifest Parse Error : White space is not allowed at this location.
12043	0x00002F0B	ERROR_SXS_XML_E_INCOMPLETE_ENCODING	Manifest Parse Error : End of file reached in invalid state for current encoding.
12044	0x00002F0C	ERROR_SXS_XML_E_MISSING_PAREN	Manifest Parse Error : Missing parenthesis.
12045	0x00002F0D	ERROR_SXS_XML_E_EXPECTINGCLOSEQUOTE	Manifest Parse Error : A single or double closing quote character (\' or \") is missing.
12046	0x00002F0E	ERROR_SXS_XML_E_MULTIPLE_COLONS	Manifest Parse Error : Multiple colons are not allowed in a name.
12047	0x00002F0F	ERROR_SXS_XML_E_INVALID_DECIMAL	Manifest Parse Error : Invalid character for decimal digit.
12048	0x00002F10	ERROR_SXS_XML_E_INVALID_HEXIDECIMAL	Manifest Parse Error : Invalid character for hexadecimal digit.
12049	0x00002F11	ERROR_SXS_XML_E_INVALID_UNICODE	Manifest Parse Error : Invalid Unicode character value for this platform.
12050	0x00002F12	ERROR_SXS_XML_E_WHITESPACEORQUESTIONMARK	Manifest Parse Error : Expecting white space or '?'.
12051	0x00002F13	ERROR_SXS_XML_E_UNEXPECTEDENDTAG	Manifest Parse Error : End tag was not expected at this location.
12052	0x00002F14	ERROR_SXS_XML_E_UNCLOSEDTAG	Manifest Parse Error : The following tags were not closed: %1.
12053	0x00002F15	ERROR_SXS_XML_E_DUPLICATEATTRIBUTE	Manifest Parse Error : Duplicate attribute.
12054	0x00002F16	ERROR_SXS_XML_E_MULTIPLEROOTS	Manifest Parse Error : Only one top level element is allowed in an XML document.
12055	0x00002F17	ERROR_SXS_XML_E_INVALIDATROOTLEVEL	Manifest Parse Error : Invalid at the top level of the document.
12056	0x00002F18	ERROR_SXS_XML_E_BADXMLDECL	Manifest Parse Error : Invalid XML declaration.
12057	0x00002F19	ERROR_SXS_XML_E_MISSINGROOT	Manifest Parse Error : XML document must have a top level element.
12058	0x00002F1A	ERROR_SXS_XML_E_UNEXPECTEDEOF	Manifest Parse Error : Unexpected end of file.
12059	0x00002F1B	ERROR_SXS_XML_E_BADPEREFINSUBSET	Manifest Parse Error : Parameter entities cannot be used inside markup declarations in an internal subset.
12060	0x00002F1C	ERROR_SXS_XML_E_UNCLOSEDSTARTTAG	Manifest Parse Error : Element was not closed.

Error			Description
decimal	Hexadecimal	Name	
12061	0x00002F1D	ERROR_SXS_XML_E_UNCLOSEDENDTAG	Manifest Parse Error : End element was missing the character '>'.
12062	0x00002F1E	ERROR_SXS_XML_E_UNCLOSEDSTRING	Manifest Parse Error : A string literal was not closed.
12063	0x00002F1F	ERROR_SXS_XML_E_UNCLOSEDCOMMENT	Manifest Parse Error : A comment was not closed.
12064	0x00002F20	ERROR_SXS_XML_E_UNCLOSEDDECL	Manifest Parse Error : A declaration was not closed.
12065	0x00002F21	ERROR_SXS_XML_E_UNCLOSEDCDATA	Manifest Parse Error : A CDATA section was not closed.
12066	0x00002F22	ERROR_SXS_XML_E_RESERVEDNAMESPACE	Manifest Parse Error : The namespace prefix is not allowed to start with the reserved string "xml".
12067	0x00002F23	ERROR_SXS_XML_E_INVALIDENCODING	Manifest Parse Error : System does not support the specified encoding.
12068	0x00002F24	ERROR_SXS_XML_E_INVALIDSWITCH	Manifest Parse Error : Switch from current encoding to specified encoding not supported.
12069	0x00002F25	ERROR_SXS_XML_E_BADXMLCASE	Manifest Parse Error : The name 'xml' is reserved and must be lower case.
12070	0x00002F26	ERROR_SXS_XML_E_INVALID_STANDALONE	Manifest Parse Error : The standalone attribute must have the value 'yes' or 'no'.
12071	0x00002F27	ERROR_SXS_XML_E_UNEXPECTED_STANDALONE	Manifest Parse Error : The standalone attribute cannot be used in external entities.
12072	0x00002F28	ERROR_SXS_XML_E_INVALID_VERSION	Manifest Parse Error : Invalid version number.
12073	0x00002F29	ERROR_SXS_XML_E_MISSINGEQUALS	Manifest Parse Error : Missing equals sign between attribute and attribute value.
13000	0x000032C8	ERROR_IPSEC_QM_POLICY_EXISTS	The specified quick mode policy already exists.
13001	0x000032C9	ERROR_IPSEC_QM_POLICY_NOT_FOUND	The specified quick mode policy was not found.
13002	0x000032CA	ERROR_IPSEC_QM_POLICY_IN_USE	The specified quick mode policy is being used.
13003	0x000032CB	ERROR_IPSEC_MM_POLICY_EXISTS	The specified main mode policy already exists.
13004	0x000032CC	ERROR_IPSEC_MM_POLICY_NOT_FOUND	The specified main mode policy was not found.
13005	0x000032CD	ERROR_IPSEC_MM_POLICY_IN_USE	The specified main mode policy is being used.
13006	0x000032CE	ERROR_IPSEC_MM_FILTER_EXISTS	The specified main mode filter already exists.
13007	0x000032CF	ERROR_IPSEC_MM_FILTER_NOT_FOUND	The specified main mode filter was not found.
13008	0x000032D0	ERROR_IPSEC_TRANSPORT_FILTER_EXISTS	The specified transport mode filter already exists.
13009	0x000032D1	ERROR_IPSEC_TRANSPORT_FILTER_NOT_FOUND	The specified transport mode filter does not exist.
13010	0x000032D2	ERROR_IPSEC_MM_AUTH_EXISTS	The specified main mode authentication list exists.
13011	0x000032D3	ERROR_IPSEC_MM_AUTH_NOT_FOUND	The specified main mode authentication list was not found.
13012	0x000032D4	ERROR_IPSEC_MM_AUTH_IN_USE	The specified quick mode policy is being used.
13013	0x000032D5	ERROR_IPSEC_DEFAULT_MM_POLICY_NOT_FOUND	The specified main mode policy was not found.
13014	0x000032D6	ERROR_IPSEC_DEFAULT_MM_AUTH_NOT_FOUND	The specified quick mode policy was not found.
13015	0x000032D7	ERROR_IPSEC_DEFAULT_QM_POLICY_NOT_FOUND	The manifest file contains one or more syntax errors.
13016	0x000032D8	ERROR_IPSEC_TUNNEL_FILTER_EXISTS	The application attempted to activate a disabled activation context.
13017	0x000032D9	ERROR_IPSEC_TUNNEL_FILTER_NOT_FOUND	The requested lookup key was not found in any active activation context.
13018	0x000032DA	ERROR_IPSEC_MM_FILTER_PENDING_DELETION	The Main Mode filter is pending deletion.
13019	0x000032DB	ERROR_IPSEC_TRANSPORT_FILTER_PENDING_DELETION	The transport filter is pending deletion.
13020	0x000032DC	ERROR_IPSEC_TUNNEL_FILTER_PENDING_DELETION	The tunnel filter is pending deletion.
13021	0x000032DD	ERROR_IPSEC_MM_POLICY_PENDING_DELETION	The Main Mode policy is pending deletion.
13022	0x000032DE	ERROR_IPSEC_MM_AUTH_PENDING_DELETION	The Main Mode authentication bundle is pending deletion.
13023	0x000032DF	ERROR_IPSEC_QM_POLICY_PENDING_DELETION	The Quick Mode policy is pending deletion.

Error			Description
decimal	Hexadecimal	Name	
13801	0x000035E9	ERROR_IPSEC_IKE_AUTH_FAIL	IKE authentication credentials are unacceptable.
13802	0x000035EA	ERROR_IPSEC_IKE_ATTRIB_FAIL	IKE security attributes are unacceptable.
13803	0x000035EB	ERROR_IPSEC_IKE_NEGOTIATION_PENDING	IKE Negotiation in progress.
13804	0x000035EC	ERROR_IPSEC_IKE_GENERAL_PROCESSING_ERROR	General processing error.
13805	0x000035ED	ERROR_IPSEC_IKE_TIMED_OUT	Negotiation timed out.
13806	0x000035EE	ERROR_IPSEC_IKE_NO_CERT	IKE failed to find valid machine certificate.
13807	0x000035EF	ERROR_IPSEC_IKE_SA_DELETED	IKE SA deleted by peer before establishment completed.
13808	0x000035F0	ERROR_IPSEC_IKE_SA_REAPED	IKE SA deleted before establishment completed.
13809	0x000035F1	ERROR_IPSEC_IKE_MM_ACQUIRE_DROP	Negotiation request sat in Queue too long.
13810	0x000035F2	ERROR_IPSEC_IKE_QM_ACQUIRE_DROP	Negotiation request sat in Queue too long.
13811	0x000035F3	ERROR_IPSEC_IKE_QUEUE_DROP_MM	Negotiation request sat in Queue too long.
13812	0x000035F4	ERROR_IPSEC_IKE_QUEUE_DROP_NO_MM	Negotiation request sat in Queue too long.
13813	0x000035F5	ERROR_IPSEC_IKE_DROP_NO_RESPONSE	No response from peer.
13814	0x000035F6	ERROR_IPSEC_IKE_MM_DELAY_DROP	Negotiation took too long.
13815	0x000035F7	ERROR_IPSEC_IKE_QM_DELAY_DROP	Negotiation took too long.
13816	0x000035F8	ERROR_IPSEC_IKE_ERROR	Unknown error occurred.
13817	0x000035F9	ERROR_IPSEC_IKE_CRL_FAILED	Certificate Revocation Check failed.
13818	0x000035FA	ERROR_IPSEC_IKE_INVALID_KEY_USAGE	Invalid certificate key usage.
13819	0x000035FB	ERROR_IPSEC_IKE_INVALID_CERT_TYPE	Invalid certificate type.
13820	0x000035FC	ERROR_IPSEC_IKE_NO_PRIVATE_KEY	No private key associated with machine certificate.
13822	0x000035FE	ERROR_IPSEC_IKE_DH_FAIL	Failure in Diffie-Helman computation.
13824	0x00003600	ERROR_IPSEC_IKE_INVALID_HEADER	Invalid header.
13825	0x00003601	ERROR_IPSEC_IKE_NO_POLICY	No policy configured.
13826	0x00003602	ERROR_IPSEC_IKE_INVALID_SIGNATURE	Failed to verify signature.
13827	0x00003603	ERROR_IPSEC_IKE_KERBEROS_ERROR	Failed to authenticate using Kerberos.
13828	0x00003604	ERROR_IPSEC_IKE_NO_PUBLIC_KEY	Peer's certificate did not have a public key.
13829	0x00003605	ERROR_IPSEC_IKE_PROCESS_ERR	Error processing error payload.
13830	0x00003606	ERROR_IPSEC_IKE_PROCESS_ERR_SA	Error processing SA payload.
13831	0x00003607	ERROR_IPSEC_IKE_PROCESS_ERR_PROP	Error processing Proposal payload.
13832	0x00003608	ERROR_IPSEC_IKE_PROCESS_ERR_TRANS	Error processing Transform payload.
13833	0x00003609	ERROR_IPSEC_IKE_PROCESS_ERR_KE	Error processing KE payload.
13834	0x0000360A	ERROR_IPSEC_IKE_PROCESS_ERR_ID	Error processing ID payload.
13835	0x0000360B	ERROR_IPSEC_IKE_PROCESS_ERR_CERT	Error processing Cert payload.
13836	0x0000360C	ERROR_IPSEC_IKE_PROCESS_ERR_CERT_REQ	Error processing Certificate Request payload.
13837	0x0000360D	ERROR_IPSEC_IKE_PROCESS_ERR_HASH	Error processing Hash payload.
13838	0x0000360E	ERROR_IPSEC_IKE_PROCESS_ERR_SIG	Error processing Signature payload.
13839	0x0000360F	ERROR_IPSEC_IKE_PROCESS_ERR_NONCE	Error processing Nonce payload.
13840	0x00003610	ERROR_IPSEC_IKE_PROCESS_ERR_NOTIFY	Error processing Notify payload.
13841	0x00003611	ERROR_IPSEC_IKE_PROCESS_ERR_DELETE	Error processing Delete Payload.
13842	0x00003612	ERROR_IPSEC_IKE_PROCESS_ERR_VENDOR	Error processing VendorId payload.
13843	0x00003613	ERROR_IPSEC_IKE_INVALID_PAYLOAD	Invalid payload received.
13844	0x00003614	ERROR_IPSEC_IKE_LOAD_SOFT_SA	Soft SA loaded.
13845	0x00003615	ERROR_IPSEC_IKE_SOFT_SA_TORN_DOWN	Soft SA torn down.
13846	0x00003616	ERROR_IPSEC_IKE_INVALID_COOKIE	Invalid cookie received..
13847	0x00003617	ERROR_IPSEC_IKE_NO_PEER_CERT	Peer failed to send valid machine certificate.
13848	0x00003618	ERROR_IPSEC_IKE_PEER_CRL_FAILED	Certification Revocation check of peer's certificate failed.
13849	0x00003619	ERROR_IPSEC_IKE_POLICY_CHANGE	New policy invalidated SAs formed with old policy.
13850	0x0000361A	ERROR_IPSEC_IKE_NO_MM_POLICY	There is no available Main Mode IKE policy.
13851	0x0000361B	ERROR_IPSEC_IKE_NOTCBPRIV	Failed to enabled TCB privilege.
13852	0x0000361C	ERROR_IPSEC_IKE_SECLOADFAIL	Failed to load SECURITY.DLL.
13853	0x0000361D	ERROR_IPSEC_IKE_FAILSSPINIT	Failed to obtain security function table dispatch address from SSPI.
13854	0x0000361E	ERROR_IPSEC_IKE_FAILQUERYSSP	Failed to query Kerberos package to obtain max token size.

Error			Description
decimal	Hexadecimal	Name	
13855	0x0000361F	ERROR_IPSEC_IKE_SRVACQFAIL	Failed to obtain Kerberos server credentials for ISAKMP/ERROR_IPSEC_IKE service. Kerberos authentication will not function. The most likely reason for this is lack of domain membership. This is normal if your computer is a member of a workgroup.
13856	0x00003620	ERROR_IPSEC_IKE_SRVQUERYCRED	Failed to determine SSPI principal name for ISAKMP/ERROR_IPSEC_IKE service (QueryCredentialsAttributes).
13857	0x00003621	ERROR_IPSEC_IKE_GETSPIFAIL	Failed to obtain new SPI for the inbound SA from Ipsec driver. The most common cause for this is that the driver does not have the correct filter. Check your policy to verify the filters.
13858	0x00003622	ERROR_IPSEC_IKE_INVALID_FILTER	Given filter is invalid.
13859	0x00003623	ERROR_IPSEC_IKE_OUT_OF_MEMORY	Memory allocation failed.
13860	0x00003624	ERROR_IPSEC_IKE_ADD_UPDATE_KEY_FAILED	Failed to add Security Association to IPSec Driver. The most common cause for this is if the IKE negotiation took too long to complete. If the problem persists, reduce the load on the faulting machine.
13861	0x00003625	ERROR_IPSEC_IKE_INVALID_POLICY	Invalid policy.
13862	0x00003626	ERROR_IPSEC_IKE_UNKNOWN_DOI	Invalid DOI.
13863	0x00003627	ERROR_IPSEC_IKE_INVALID_SITUATION	Invalid situation.
13864	0x00003628	ERROR_IPSEC_IKE_DH_FAILURE	Diffie-Hellman failure.
13865	0x00003629	ERROR_IPSEC_IKE_INVALID_GROUP	Invalid Diffie-Hellman group.
13866	0x0000362A	ERROR_IPSEC_IKE_ENCRYPT	Error encrypting payload.
13867	0x0000362B	ERROR_IPSEC_IKE_DECRYPT	Error decrypting payload.
13868	0x0000362C	ERROR_IPSEC_IKE_POLICY_MATCH	Policy match error.
13869	0x0000362D	ERROR_IPSEC_IKE_UNSUPPORTED_ID	Unsupported ID.
13870	0x0000362E	ERROR_IPSEC_IKE_INVALID_HASH	Hash verification failed.
13871	0x0000362F	ERROR_IPSEC_IKE_INVALID_HASH_ALG	Invalid hash algorithm.
13872	0x00003630	ERROR_IPSEC_IKE_INVALID_HASH_SIZE	Invalid hash size.
13873	0x00003631	ERROR_IPSEC_IKE_INVALID_ENCRYPT_ALG	Invalid encryption algorithm.
13874	0x00003632	ERROR_IPSEC_IKE_INVALID_AUTH_ALG	Invalid authentication algorithm.
13875	0x00003633	ERROR_IPSEC_IKE_INVALID_SIG	Invalid certificate signature.
13876	0x00003634	ERROR_IPSEC_IKE_LOAD_FAILED	Load failed.
13877	0x00003635	ERROR_IPSEC_IKE_RPC_DELETE	Deleted via RPC call.
13878	0x00003636	ERROR_IPSEC_IKE_BENIGN_REINIT	Temporary state created to perform reinitialization. This is not a real failure.
13879	0x00003637	ERROR_IPSEC_IKE_INVALID_RESPONDER_LIFETIME_NOTIFY	The lifetime value received in the Responder Lifetime Notify is below the Windows 2000 configured minimum value. Please fix the policy on the peer machine.
13880	0x00003638	ERROR_IPSEC_IKE_QM_LIMIT_REAP	SA reaped because QM limit was reached.
13881	0x00003639	ERROR_IPSEC_IKE_INVALID_CERT_KEYLEN	Key length in certificate is too small for configured security requirements.
13882	0x0000363A	ERROR_IPSEC_IKE_MM_LIMIT	Max number of established MM SAs to peer exceeded.
13883	0x0000363B	ERROR_IPSEC_IKE_NEGOTIATION_DISABLED	IKE received a policy that disables negotiation.
13884	0x0000363C	ERROR_IPSEC_IKE_QM_LIMIT	Reached maximum quick mode limit for the main mode. New main mode will be started.

8 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Download finder

Our download finder contains all the files that we offer you for downloading. You will find application reports, technical documentation, technical drawings, configuration files and much more.

The downloads are available in various formats.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

The addresses of Beckhoff's branch offices and representatives round the world can be found on our internet page: www.beckhoff.com

You will also find further documentation for Beckhoff components there.

Beckhoff Support

Support offers you comprehensive technical assistance, helping you not only with the application of individual Beckhoff products, but also with other, wide-ranging services:

- support
- design, programming and commissioning of complex automation systems
- and extensive training program for Beckhoff system components

Hotline:	+49 5246 963-157
e-mail:	support@beckhoff.com

Beckhoff Service

The Beckhoff Service Center supports you in all matters of after-sales service:

- on-site service
- repair service
- spare parts service
- hotline service

Hotline:	+49 5246 963-460
e-mail:	service@beckhoff.com

Beckhoff Headquarters

Beckhoff Automation GmbH & Co. KG

Huelshorstweg 20
33415 Verl
Germany

Phone:	+49 5246 963-0
e-mail:	info@beckhoff.com
web:	www.beckhoff.com

Trademark statements

Beckhoff®, ATRO®, EtherCAT®, EtherCAT G®, EtherCAT G10®, EtherCAT P®, MX-System®, Safety over EtherCAT®, TC/BSD®, TwinCAT®, TwinCAT/BSD®, TwinSAFE®, XFC®, XPlanar® and XTS® are registered and licensed trademarks of Beckhoff Automation GmbH.

Third-party trademark statements

Arm, Arm9 and Cortex are trademarks or registered trademarks of Arm Limited (or its subsidiaries or affiliates) in the US and/or elsewhere.

DALI, DALI-2, D4i, DALI+, and DiiA are trademarks in various countries in the exclusive use of the Digital Illumination Interface Alliance.

Excel, IntelliSense, Microsoft, Microsoft Azure, Microsoft Edge, PowerShell, Visual Studio, Windows and Xbox are trademarks of the Microsoft group of companies.

FreeBSD is a registered trademark of The FreeBSD Foundation and is used by Beckhoff with the permission of The FreeBSD Foundation.

Intel, the Intel logo, Intel Core, Xeon, Intel Atom, Celeron and Pentium are trademarks of Intel Corporation or its subsidiaries.

The registered trademark Linux® is used pursuant to a sublicense from the Linux Foundation, the exclusive licensee of Linus Torvalds, owner of the mark on a worldwide basis.

More Information:
www.beckhoff.com/te1000

Beckhoff Automation GmbH & Co. KG
Hülshorstweg 20
33415 Verl
Germany
Phone: +49 5246 9630
info@beckhoff.com
www.beckhoff.com