

Configuring the Beckhoff BK9000 Network Parameters

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1 Overview of Steps

Note: The IP address can be set using other methods (BootP, DHCP, BK9000 dip switches + KS2000 software). For more information on these methods, go to V:\CD\Beckhoff\BK9000e.pdf page 22.

1. Install required software on computer/laptop (must be running Windows OS)
 - a. On your Windows machine, browse to V:\CD\Beckhoff
 - b. Install TwinCAT
 - c. Install KS2000
 - d. Install update to KS2000 v4
 - e. Restart your computer
2. Configure network parameters
 - a. Power the BK9000 off. Set dip switch #2 to ON (ON is left looking from the front). Set all others to OFF.
 - b. Turn on the power to the BK9000
 - c. Connect an Ethernet cable from your Windows machine to the BK9000
 - d. Use arp to set the IP address
 - e. Use the Beckhoff software to configure the subnet mask and gateway address
 - f. Verify network connectivity

2 Parts List

- a. Windows laptop or computer
- b. Ethernet cable
- c. Small flat-head screwdriver
- d. If you use the Beckhoff serial cable to set the subnet mask and gateway address, your computer will need a DB9 serial port (you can also use a DB9 adaptor).

3 Required Beckhoff Software

- a. TwinCAT (this just needs to be installed; you will not need to run this software)
- b. KS2000 v4

4 Install Required Software (must be running Windows OS)

- a. On your Windows machine, browse to V:\CD\Beckhoff
- b. Install TwinCAT
 1. Open the *tcat_290* application
 2. Click on *Run*
 3. Click on *Next*
 4. Choose *English*, then click *Next*
 5. TwinCAT Setup window will open
 6. Click on *Next*
 7. Click *Yes* for license agreement
 8. Click *Yes*
 9. Click *Next* to install the 30-day demo version
 10. Click *No* at symbol-handling update
 11. Choose *TwinCAT IO – I/O Driver*, click *Next*
 12. Choose 30-day demo version
 13. Keep default features, click *Next*
 14. Click *Next*
 15. Click *Next* to install in the default folder
 16. Select *No*, then click *Finish*
- c. Install KS2000
 1. Browse to V:\CD\Beckhoff\KS2000\Installation_v31
 2. Open the *KS2000_318* application
 3. Click *Run*
 4. Choose *U.S. English*, click *OK*
 5. KS2000 Railstation Configuration Tool window will open, click *Next*
 6. Click *Next*
 7. Fill in *Name, Company*, click *Next*
 8. Click *Next* to install in the default folder
 9. Verify *KS2000 Railstation Configuration Setup* is selected, click *Next*
 10. Click *Next* to install in default folder
 11. After installation, click *Finish*
- d. Install update to KS2000 v4
 1. Return to V:\CD\Beckhoff
 2. Open the *KS2000_V4* application
 3. Click *Run*
 4. Click *Next*
 5. Click *Yes* for license agreement
 6. Read information and click *Next* to install
 7. Click *Finish*
- e. Restart your computer

5 Configure Network Parameters

Note: You must have administrator privileges to run this procedure.

Note: In the example below, 172.27.13.XYZ is used as the production IP address (the one you are trying to configure.)

- a. Power the BK9000 off. Set dip switch #2 to ON (ON is left looking from the front). Set all others to OFF.
- b. Turn on the power to the BK9000
- c. Connect an Ethernet cable from your Windows machine to the BK9000
- d. Use arp to set the IP address
 1. Open a DOS window (Start menu > Run > cmd.exe)
 2. Open Start Menu > Settings > Network Connections > Local Area Connection > General > Properties > Internet Protocol (TCP/IP Properties) > Properties
 3. Select 'Use the following IP address:'
 4. Fill the IP address field with 172.16.17.1
 5. Fill the Subnet mask field with 255.255.255.0
 6. Click OK to the TCP/IP Properties window
 7. Click OK to the Local Area Connection Properties window
 8. At the DOS prompt, type *ipconfig* to verify that the Windows machine IP address is configured correctly:

```
>ipconfig
Windows IP Configuration

Ethernet adapter Wireless Network Connection:
    Media State . . . . . : Media disconnected
Ethernet adapter Local Area Connection:
    Connection-specific DNS Suffix . :
    IP Address. . . . . : 172.16.17.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . .
```

9. At the DOS prompt, type *ping 172.16.17.2* (Beckhoff default IP address):

```
>ping 172.16.17.2
Pinging 172.16.17.2 with 32 bytes of data:
Reply from 172.16.17.2: bytes=32 time=4ms TTL=60
Reply from 172.16.17.2: bytes=32 time=2ms TTL=60
Reply from 172.16.17.2: bytes=32 time=2ms TTL=60
Reply from 172.16.17.2: bytes=32 time=2ms TTL=60
```

10. At DOS prompt type *arp -a*:

```
>arp -a

Interface: 172.16.17.1 --- 0x30003
Internet Address Physical Address Type
172.16.17.2      00-01-05-02-01-25 dynamic
```

(Your physical address will be different in the last 3 pairs of digits.)

11. Type *arp -d 172.16.17.2*

This will remove the address from the arp table.

12. Open Start Menu > Settings > Network Connections > Local Area Connection > General > Properties > Internet Protocol (TCP/IP Properties) > Properties

(This example assumes you want to set the Beckhoff IP address to 172.27.13.XYZ)

13. Fill the IP address field with an unused address beginning with 172.27.13.
14. Fill the Subnet mask field with 255.255.255.0 (if not already set to that)
15. Click OK to TCP/IP Properties window
16. Click OK to Local Area Connection Properties window.
17. At the DOS prompt, type *arp -s 172.27.13.XYZ 00-01-05-xx-xx-xx* (your Beckhoff MAC address; MAC address is from the back of the BK9000 or from the *arp -a* you did earlier)
18. At the DOS prompt, type *ping -l 123 172.27.13.XYZ*
19. Power off BK9000
20. Set all dip switches to OFF
21. Power on BK9000
22. At the DOS prompt, type *ping 172.27.13.XYZ*

```
>ping 172.27.36.XYZ
Pinging 172.27.13.XYZ with 32 bytes of data:
Reply from 172.27.13.XYZ: bytes=32 time=5ms TTL=60
Reply from 172.27.13.XYZ: bytes=32 time=2ms TTL=60
Reply from 172.27.13.XYZ: bytes=32 time=2ms TTL=60
Reply from 172.27.13.XYZ: bytes=32 time=2ms TTL=60
```

- e. Use the Beckhoff software to configure the subnet mask and gateway address

1. Open KS2000_v4 application
2. Set KS2000 language to English
 - i. From KS2000 toolbar, go to Optionen > Sprache
 - ii. Select Englisch
3. Use KS2000 software to establish communication with BK9000
 - i. IF USING ETHERNET CABLE
 1. From KS2000 toolbar, go to Options > Communication channel > via ADS...
 2. Set AmsServerNetId to 172.27.13.XYZ.1.1 and click OK
 3. From KS2000 toolbar, go to Online > Login
 - ii. IF USING BECKHOFF SERIAL CABLE
 1. From KS2000 toolbar, go to Options > Communication channel > via COM...
The default serial settings should be right:
 - a. Baud = 19200
 - b. Databits = 8
 - c. Parity = Even
 - d. Stopbits = 1
 - e. BKx Type = RS232

Click OK.

2. From KS2000 toolbar, go to Online > Login

4. Set subnet mask and gateway address
 - i. An expandable list of the connected Beckhoff modules should have appeared on the left pane of the KS2000 window
 - ii. Click on Pos 0 : BK9000-000 > Settings > Fieldbus: Settings
 - iii. On the right pane, set the netmask and gateway fields and click Apply. For LCLS production, netmask=255.255.252.0 and gateway=172.27.12.1
 - iv. Click Yes at the 'Reboot to take settings?' prompt
- f. Verify network connectivity
 - i. Connect the BK9000 to the network
 - ii. Ping the Beckhoff node from a production server (for example, lcls-srv01, lcls-builder)