

# SETUP AND SOFTWARE INSTALLATION INSTRUCTIONS FOR THE KTX WIRELESS SYSTEM

SPECIAL NOTE

READ THIS ENTIRE BOOKLET BEFORE PROCEEDING WITH THE INSTALLATION BOONE CABLE WORKS & ELECTRONICS, INC. 1773-219TH LANE - P.O. BOX 429 BOONE, IOWA 50036 USA PHONE (515) 432-2010 FAX (515) 432-5262 TOLL FREE (800) 265-2010



The following instructions will explain how to set up the Gateway (Connectport X2D) with the wireless radio(s) (BRX-KTX#(s)) on a computer and using it with the BCS Grain software.

# TABLE OF CONTENTS

ltem	Description	Page
1	THINGS YOU MUST DO FIRST	2
2	DIGI DEVICE DISCOVERY	3
3	CONFIGURING THE GATEWAY	4
4	SWITCH TEST	7
5	BCSGRAIN SOFTWARE INSTALLATION AND SETUP	9
6	TROUBLE SHOOTING	12

ROLFES @ Boone

## 1. THINGS YOU MUST DO FIRST

- 1.1 You must be logged on to Windows as the Computer Administrator (see glossary below)
  - 1.1.1. To check this, open 'Control Panel'.
  - 1.1.2. Open User Accounts, you will see a list of accounts that have Administrator privileges.
- 1.2 Make sure the computer is fully updated through Windows Update, Hardware, and Software. Also check for updates through the computer's manufacturer's website.
- 1.3 Close all other programs prior to installation.
- 1.4 When using a stand-alone computer, set the Local Area Connection to IP address: 169.254.1.50, with Subnet mask: 255.255.0.0.
- 1.5 If the stand-alone computer has a wireless connection, disable it first, then change the Local Area Connection.
  For Windows XP; go to Start -> Control Panel -> Network Connections -> right click the Wireless Adapter -> Disable.
  For Windows 7; go to Start -> Control Panel -> Network and Internet ->

For Windows 7; go to Start -> Control Panel -> Network and Internet -> Network and Sharing Center -> Change Adapter Settings (top left corner) -> right click the Wireless Adapter -> Disable.

1.6 The Gateway (Connectport X2D) uses UDP port 7650. The BRX radios use UPD ports 7661 and up, depending on how many BRX units are used. Verify with your IT administrator that these ports are available on the network.

## 2. DIGI DEVICE DISCOVERY

- 2.1 Insert the BCSGrain software disk or USB drive into the computer.
- 2.2 Make sure the AutoPlay window appears, like the picture below:

🚱 AutoPlay
DVD Drive (E:) BCSGrain 1.6.0
Always do this for software and games:
Install or run program from your media
Run setup.exe Publisher not specified
General options
Open folder to view files using Windows Explorer
View more AutoPlay options in Control Panel

- 2.3 Select "Open folder to view files".
- 2.4 If the window above does not appear, double click on "computer", right click on the DVD/CD or USB Drive, and select open.
- 2.4 Double click the "Digi Device Utility" folder.
- 2.5 Right click the Digi Device Discovery application and select "Copy".
- 2.6 Close the window and right click the desktop and select "Paste". The Digi Device Discovery icon should now be on the desktop.

## 3. CONFIGURING THE GATEWAY

The Gateway uses DHCP to identify itself on the Network. It will create a random address available on the Network. If you wish to use your own IP address, you can change it afterwards.

- 3.1 Make sure the Gateway, the radio(s) (BRX-KTX#), and the KTX Mux(s) are hooked up and powered on.
- 3.2 When using a <u>stand-alone</u> computer, set the Local Area Connection to IP address: 169.254.1.50, with Subnet mask: 255.255.0.0.
- 3.3 Run the Digi Device Discovery and make sure the Gateway (ConnectPort X2D) shows up in the list with an IP and MAC address.

Digi Device Discovery				
Device Tasks	IP Address	MAC Address	Name	Device
Open web interface Telnet to command line Configure network settings Restart device	2 <b>5</b> 192, 168, 0, 40	00:40:9D:56:46:34		ConnectPort X2D
Other Tasks				
Refresh view Help and Support				
Details	1			
evice	-			My Device Network

- 3.3 Highlight the IP address and select 'Open web interface' at the top left or double click the IP address.
- 3.4 The Configuration and Management window should open in your web browser.



## INSTALLATION AND SETUP INSTRUCTIONS FOR THE KTX WIRELESS SYSTEM

Digit	ConnectPort	2D Configuration and Manager
Home		
Configuration	Home	
Network	Getting Started	
XBee Network System	Tutorial Not sure w	hat to do next? This Tutorial can help.
iDigi	System Summary	
Security	Model	ConnectPort X2D
Applications Python	Ethernet MAC Address:	00:40:9D:56:46:34
Industrial Automation	Ethernet IP Address:	192.168.0.40
Management		
Connections	Description:	None
Event Logging	Contact:	None
Administration File Management	Location:	None
X.509 Certificate/Key Management	Device ID:	0000000-0000000-00409DFF-FF564634
Backup/Restore	2	
Eactory Default Settings		
System Information		
Debaat		

- 3.5 To change the DHCP settings of the Gateway, select 'Network' at the top left.
- 3.6 Select 'Use the following IP address' to either change the IP address or use the current IP address. Apply when done.

<ul> <li>Obtain an IP address</li> </ul>	automatically using DI	HCP *
Ose the following IP a	ddress:	
* IP Address:	192.168.0.40	
* Subnet Mask:	255.255.255.0	Set here to Static IP
Default Gateway:	192.168.0.1	
Enable AutoIP address	s assignment	
Enable AutoIP address     Changes to DHCP, IP address     Apply     Apply where	s assignment dress, and Subnet Ma: <b>1 done</b>	sk may affect your browser connection
Enable AutoIP address     Changes to DHCP, IP address     Apply Apply wher     Network Services Setting	s assignment dress, and Subnet Mas n <b>done</b> 15	sk may affect your browser connection
Enable AutoIP address     Changes to DHCP, IP add     Apply     Apply wher     Network Services Setting     IP Forwarding Settings	s assignment dress, and Subnet Ma: <b>1 done</b> 15	sk may affect your browser connection
<ul> <li>Enable AutoIP address</li> <li>Changes to DHCP, IP address</li> <li>Apply</li> <li>Apply when</li> <li>Network Services Setting</li> <li>IP Forwarding Settings</li> <li>Socket Tunnel Settings</li> </ul>	s assignment dress, and Subnet Ma: n done 15	sk may affect your browser connection



#### INSTALLATION AND SETUP INSTRUCTIONS FOR THE KTX WIRELESS SYSTEM

3.7 To setup the radio(s) or KTX(s), select 'XBee Network' at the top left.3.8 Select 'Discover Xbee Device' to refresh the list. Make sure you checkmark the "Clear list before discovery". The Gateway will show up as the coordinator. The radio(s) will show up as router(s).



# **ConnectPort X2D Configuration and Management**

Home	XBee Confi	guration			
Configuration Network	▼ XBee Device	25			
XBee Network System	Gateway Devi	ce Details			
iDigi Security	PA Cha	N ID: 0x5b67 - 0x3f annel: 0x0b (2405 M	4a21c2067556e0 Hz)		
Applications Python	Gateway Ad Gateway Firm	dress: 00:13:a2:00:4 ware: 0x21a7	10:a8:e5:4d!		
Industrial Automation	Network View	of the XBee Devices			
Connections	Select a devic	e to configure:			
Event Logging	Node ID 🔺	Network Address	Extended Address	Node Type	Product Type
Administration	GateWay	[0000]!	00:13:a2:00:40:a8:e5:4d!	coordinator	X2 Gateway
File Management	KTX01	[9296]!	00:13:a2:00:40:9f:3f:e1!	router	Unspecified
Management	KTX02	[ee78]!	00:13:a2:00:40:9f:40:8c!	router	Unspecified
Backup/Restore	КТХ03	[9a3a]!	00:13:a2:00:40:9f:40:7c!	router	Unspecified
Update Firmware	KTX04	[c58e]!	00:13:a2:00:40:9f:3f:c2!	router	Unspecified
Factory Default Settings	KTX05	[9b17]!	00:13:a2:00:40:9f:40:b9!	router	Unspecified
Reboot	KTX06	[87fb]!	00:13:a2:00:40:9f:3f:de!	router	Unspecified
Logout	1 coordinator	r, 6 routers			
	Discover XB Clear list I Gateway Acc	ee Devices before discovery ess nware Update			
	OTA Firmwar	e Undate Setun			
	OTA Firmwar	e Undate Status			
	V OTA FITTIWal	e opdate Status			

- 3.9 If the KTX(s) don't show up or some of them do not show up in the list, verify connections to the radio(s) (BRX-KTX#(s)). Once everything has been verified, select "Reboot" from the Administration section on the left and click the reboot button. This should take about a minute.
- 3.10 After reboot, it should return to the home screen. Close the windows and proceed to step number 4, Switch test.



## **4 SWITCH TEST**

- 4.1 Return to the CDROM/USB drive and run setup.exe from the Switch test folder.
- 4.2 The 2 Switch test windows will appear. The BCS Interfaces window will have the Gateway with an IP address and Port#.

•	B	CS Switch T	lest (					_			×
Fi		🖶 BCS Inte	erfaces				_			$\times$	
07:21 07:2 07:2		Name Gateway		IP Address 192.168.0.	70	Port 7650	Type BGX		Version 1.9		^
-0	Se Ca T(	Select ection 0 able 0 C 0		<ul> <li>Temperatu</li> <li>Resistance</li> <li>Voltage</li> </ul>	re	Relay	,		Search		]
											:

- 4.3 Highlight the Gateway and click on the "Select" button. The Interfaces window will disappear.
- 4.4 On the BCS Switch Test window, underneath the last line put the cursor in the window and type "gd".





# ROLFES @ Booke INSTALLATION AND SETUP INSTRUCTIONS FOR THE KTX WIRELESS SYSTEM

4.5A list will appear of all the switches (Mux) out in the field.

🖳 BCS	Switch	n Test					-		$\times$
File	Edit	Tools	Help						
10:40:063 10:40:094 10:40:110 10:44:610 10:44:610 10:44:612 12:33:95 12:335	id? 192.1 192.1 rem? clear 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1 192.1	68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70 68.0.70	rsp&id&poi 5 rsp&id&poi 9 rsp&id&poi 9 Mux,1,1 9 Mux,1,2 9 Mux,2,3 9 Mux,2,4 9 Mux,3,5 9 Mux,4,7 9 Mux,5,1(1 9 Mux,5,1(1 9 Mux,6,11 9 Mux,7,12 9 Mux,8,14 9 Mux,8,14	t=7650&type=BGX nt=7650&type=BG>	&name≓ K&name	Gateway&vei =TestGatewa	rsion=1.10. ay&version=	4 =1.9	^
						-			~
Dev	ice	0 💠		Off		Туре	~	Ge	t
Sec	tion	0 🜲	1	○ Temperature					
Cab	le	0 💠		<ul><li>Resistance</li><li>Voltage</li></ul>	[	Relay			
102.16	8 0 70-7	7650	Gateway	BGX 1 10 /					

4.6To verify each switch or Mux is working, set the Device output to the individual Mux's. For each Mux it should give a 3-line output (see picture below).

15:30:619 192.168.0.70 14 15:30:682 192.168.0.70 >1 15:30:744 192.168.0.70 >1	get l:ack l:MUX,K8X,3.0,Off			~
Output Device 14	Mode Off	Туре	Get	]

- 4.7 When an "Xbee not found" message appears on one of the Mux's, check the power to the BRX board associated with the Mux.
- 4.8 When only an ">ack" appears, check the connections from the radio to the KTX Mux and power to the Mux (lights on the K8X board).



## 5 BCSGRAIN SOFTWARE INSTALLATION AND SETUP

5.1 Re-insert the CD or USB drive in the computer. Select, "Run setup.exe".



5.2 Select "Install" when prompted.

Application Install - Security Warning	×
Publisher cannot be verified. Are you sure you want to install this application?	<b></b>
Name: BCS GRAIN From (Hover over the string below to see the full domain): E:	
Publisher: Unknown Publisher Install	Don't Install
While applications can be useful, they can potentially harm your compute source, do not install this software. <u>More Information</u>	er. If you do not trust the



#### INSTALLATION AND SETUP INSTRUCTIONS FOR THE KTX WIRELESS SYSTEM

5.3 After the program installs it will ask for the Site file. Select "OK".



- 5.4 A new window will open. Make sure it's at the CD or USB Drive location. If not, go to that location.
- 5.5 Double click the "Site" file or "GrainSite" file. This will start the BCSGrain software.
- 5.6 Go to Tools -> Options and select the Network tab. The Lan Address is the Computer's IP address.
- 5.7 Click on "Add", to add the Gateway. ID #1 will be added to the list with the default SysType (BCS), the default IP address (192.168.0.198), and default Remote port# (7654).

yste	em Networ	k Database	Alarms Send	To Email			
	Add		Lan: 192	2.168.0.66			
Id	SysType	Address	RemotePort	LocalPort	Status	Measure	
1	BCS	192.168.0.198	7654	7661		Off	

### **ROLFES** *©* **Booke** INSTALLATION AND SETUP INSTRUCTIONS FOR THE KTX WIRELESS SYSTEM

- 5.8 Change the SysType to GW by double clicking "BCS". A drop-down arrow will appear to change it.
- 5.9 Change the Address from 192.168.0.198 to IP address of the Gateway listed in Switch Test and/or Digi Discovery. Double click the address to change it.
- 5.10 Change the Remote port from 7654 to 7650 as was listed in Switch Test. Double click to change it.

Syste	em Ne	twor	< Database	Alarms Se	nd To Ema	ail			
	Add			Lan: 1	92.168.0.65	5			
d	SysTyp	e /	Address	RemotePort	LocalPort	Status	ReadMsg	Groups	
1	GW.		192.168.0.57	7650	7661	OK	L.	(Collection)	

- 5.11 When it's done, select "OK" and restart the BCSGrain program. Select Read and begin a read.
- 5.12 In the case where there is already a BCSE1000 instrument in place, set the BCS to ID 1 with its IP address, RemotePort to 7654, and LocalPort to 7661. The Gateway will be ID 2 with RemotePort 7650 and LocalPort 7662.

Syst	em Netw	ork Database	Alarms Ser	nd To Er	nail		
	Add		Lan: 1	92.168.0.4	43		
Id	SysType	Address	RemotePort	LocalPo	ort Status	ReadMsg	Groups
1	BCS	192.168.0.98	7654	7661	OK	1	(Collection)
2	GW	192.168.0.198	7650	7662	OK		(Collection)

5.13 In case of a great number of BRX radios on one Gateway, it can read 20 BRX Radios at a time, before it reads the rest of them.

#### 6 TROUBLE SHOOTING

- 6.1 When <u>all</u> the radios are powered up and a "Fail Interface Check" error message appears, check the list under Tools -> Options -> Network and make sure the settings match the ones found in Switch Test. If they are, close the program, reopen Digi Device Discovery and reboot the Gateway.
- 6.2 To check the Signal Strength of each radio, do the following:

6.2.1 Open Digi Device Discovery and double click the Gateway.
6.2.2 Select XBee Network from the Configuration section and do a 'Discover Xbee Devices' (check-mark "clear list").
6.2.3 Select the first KTX (or closest radio to the Gateway) and go to

the "Device Status" at the bottom.

XBee Configuration								
Extended Address: Product Type: Firmware Version:	00:13:a2:00:40:9f:3f:e1! Unspecified 0x22a7							
Basic Settings	Basic Settings							
Advanced Settings								
▼ Device Status								
XBee Node								
	Node Type:	router						
	Profile ID:	0xc105						
	Manufacturer ID:	0x101e						
RF Module								
61	PAN identifier (OI):	0x5b67						
	Extended PAN identifier (OP):	0x3f4a21c2067556e0						
	Operating channel (CH):	0xb						
	Network address (MY):	0x9296						
	Parent address (MP):	0xfffe						
	Association indication (AI):	0x0						
	Firmware version (VR):	0x22a7						
	Hardware version (HV):	0x1e46						
	Device type identifier (DD):	0×30000						
	ACK failures (EA):	1						
	Number of remaining children (NC):	12						
	Maximum RF payload (NP):	84 bytes						
	Received signal strength (DB):	51 -dBm						
	Supply voltage (%V):	3275 mvolts						
	Temperature (TP):	26 degrees C						
	Transmit power at PL4 (PP):	18 dBm						
Refresh								
Device Operations								

6.2.4 Make sure the "Received signal strength (DB)" is as low as possible. Anything over 90 –dbm for the radio closest to the Gateway is not acceptable. Adjust the position of the radio to get better signal strength.

6.3 If only one of the KTX Mux's is not responding, instead of going to "Device Status', select "Advanced Settings" and make sure the "DIO7 Configuration (D&7)" is set to "7". If not, change it and select "Apply" at the bottom of the screen. Reboot the Gateway.

Extended Address: 00:13:a2:00:40:9 Product Type: Unspecified Firmware Version: 0x22a7	9f:3f:e1!		
Basic Settings			
<ul> <li>Advanced Settings</li> </ul>			
The following are advanced settings. U	Jse cautio	n - modifying some settings can make remo	
Aggregation route notification (AR):	255	x 10 sec (0-255)	
Associate LED blink time (LT):	0	x 10 msec (0-255)	
Broadcast radius (BH):	0	(0-32)	
Command sequence character (CC):	+	(char)	
Cluster identifier (CI):	0x11	(0x0-0xffff)	
Command mode timeout (CT):	100	x 100 msec (2-655)	
PAN conflict threshold (CR):	3	(1-63)	
Destination address (DH/DL):	00:00:00:00:00:00:00! (address)		
Destination endpoint (DE):	0xe8	(0x1-0xf0)	
AD0/DIO0 configuration (D0):	1	(0-5)	
AD1/DIO1 configuration (D1):	0	(0-6)	
AD2/DIO2 configuration (D2):	0	(0-5)	
AD3/DIO3 configuration (D3):	0	(0-5)	
AD4/DIO4 configuration (D4):	0	(0-5)	
DIO5/Assoc configuration (D5):	1	(0-5)	
DIO6 configuration (D6):	0	(0-5)	
DIO7 configuration (D7):	7	(0-7)	

- 6.4 To restart the Gateway, right click the Gateway in the Digi Device Discovery program and select "Restart Device". Be aware, If DHCP is still selected in the Gateway, the IP address might change.
- 6.5 If the date and time doesn't want to match up with the actual date and time, go back to the "Date and Time Settings" described in item 4. Under the "Time Source Settings", select "1" and change the "FQDN" to 'time.devicecloud.com. Select "Apply" and make sure the date and time is correct.
- 6.6 If there are problems installing this software or any other issues, please contact Boone Cable Works & Electronics at (515) 432-2010 or 1-800-265-2010 or visit our website: http://www.rolfesatboone.com.