# TSI® FMS 5 SOFTWARE HOW TO CONFIGURE A BUDDY SYSTEM

TECHNICAL BULLETIN TCC-114 (6/5/24) Rev D

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# Description

This technical note explains the ideal configuration for a Buddy System. The proper configuration will include a Main Node (FMS Main Server) that writes to database FMS01 located on the PostgreSQL Database Server. The Buddy Server should then write to the same database FMS01 located on the PostgreSQL Database Server. This configuration will ensure that the main Database FMS01 database is kept synchronized.

If using security, it is recommended to have the Watchdog Node on the Buddy Server as the password server. When this document references security, it assumes the Watchdog Node on the Buddy Server is the password server.



### Prerequisites

FMS 5.1.0 must be installed on both the FMS Main Server Computer and the Buddy Server.

Both servers must be on the same network and subnet.

For FMS 5.7 and later only PostgreSQL Server version 11 or higher can be used, recommended version is version 15.

### Assumptions

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This document assumes the following:

- Main Monitor Node Name: MainNode
- Database Name: FMS01
- o Mirror Database Name: FMS01
- o User Name: monitor
- o Password: fms
- TCP/IP Address: 192.168.1.6
- Watchdog Node Name: Watchdog
  - Database Name: FMS01
  - o Mirror Database Name: FMS01
  - o User Name: monitor
  - o Password: fms
  - TCP/IP Address: 192.168.1.50
- Buddy Node Name: MainNodeBuddy

• PostgreSQL 9.3 Databases for both computers have been installed in the following folder: *C:\Program Files (x86)\PostgreSQL\9.3* 

# MainNode Computer Configuration Instructions

- 1. Start pgAdmin III.
- 2. Add the local IP address to the file pga\_hba.conf. To start:
  - Under Menu File, select Open "pga\_hba.conf"
  - Browse for this file within the PostgreSQL 9.3 installation folder (C:\PROGRAM FILES (X86)\POSTGRESQL\9.3\DATA)
- 3. On the Backend Access Configuration Editor screen, double click on the last line as shown below.



4. Enter the following values:

🛄 Client A	cess Configuratio	n 🗙
Enabled	<b>v</b>	
Туре	host	•
Database	all	•
User	all	•
IP Address	192.168.1.6/32	
Method	trust	•
Option		
Help	ОК	Cancel

Note: The IP address is your local Computer IP Address

- 5. Click OK.
- 6. Click the **Save** icon and exit.

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File Edit	Help					4		
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Туре	Database	User	IP-Address	Method	Option			
🗹 host	all	all	127.0.0.1/32	md5		/		
🗹 host	all	all	::1/128	md5				
🗌 host	replication	postgres	127.0.0.1/32	md5				
🗖 host	replication	postgres	::1/128	md5				
🗹 host	all	all	10.0.0.100/32	md5				
host	all	all	192.168.1.50/32	trust				
M host	all	all	192.168.1.6/32	trust				
•						Þ		
Configurati	ion read from C:\Program	Files (x86)\PostgreSQL\	9.3\data\pg_hba.conf					

- 7. Repeat Step 3 to add the Watchdog IP address to PostgreSQL.
- 8. Enter the following values:

🧮 Client Access Configuration 🛛 🗙						
Enabled						
Туре	host	•				
Database	all	•				
User	all	•				
IP Address	192.168.1.50/32					
Method	trust	•				
Option						
Help	ОК	Cancel				

#### 9. Click OK.

10. Save and exit the Backend Access Configuration Editor.

@Backend Access Configuration Editor							
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Туре	Database	User	IP-Address	Method	Option		
🔽 host	all	all	127.0.0.1/32	md5			
🗹 host	all	all	::1/128	md5			
🗌 host	replication	postgres	127.0.0.1/32	md5			
🗌 host	replication	postgres	::1/128	md5			
🔽 host	all	all	10.0.0.100/32	md5			
🔽 host	all	all	192.168.1.50/32	trust			
🗹 host	all	all	192.168.1.6/32	trust			
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Configurati	on read from C:\Program	Files (x86) PostgreSQL	9.3\data\pg_hba.conf			11.	

- 11. Restart PostgreSQL 9.3 Service. Create the MainNode. To do so, edit the file "C:\FMS5\Bin\Guard.ini"
  - Append to the existing line the following extension: -node=MainNode
  - The new line will be: C:\FMS5\bin\Monitor -node=MainNode
- 12. With Microsoft<sup>®</sup> Windows<sup>®</sup> Explorer<sup>®</sup> browser, navigate to C:\FMS5\Node and rename the existing *YourComputerName.xml* file to MainNode.xml.
- 13. Edit MainNode.xml and replace any occurrence of YourComputerName with MainNode.

- 14. Restart the GuardService.
- 15. Start FMS5 Client.
- 16. Go to **Configure Node** then **Database Settings** and enter the following values:

Server Address:	192.168.1.6
Port:	5432
Node & Client User:	monitor
Node & Client Password:	fms

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onfigured				
MainNode				
Configuration	Database			
<ul> <li>Monitor Summary Monitor Settings</li> <li>Buddy Settings</li> </ul>	Connection			
Database Settings Mirror Database Settings	Database Type	QPSQL	•	
Reporting Settings Security	Server Address	192.168.1.6	Port (0=Default) 5432	Test Connection
	Database Name	fms01		
	Node User monit	or	Client User monitor	
	Password and		Password and	
✓Ok XCance				
essages				
Node Date/T	ime 🔺 Source	Туре	Message	
Local 19-03-201	19-03-2015 12:58:09 Local		Monitor Has Connected MainNode from 192.168.1.6	
Local 19-03-201	12:58:08 Local	Ok	Monitor Has Connected MainNode from	n 192.168.1.6
				10 03 2015 13-03-

17. Go to **Mirror Database Settings** and enter the following values:

Database Type:	QPSQL
Server Address:	192.168.1.50
Port:	monitor
Node & Client Password:	5432
Database Name:	fms01
Enable Mirroring:	Checked
Node & Client User:	monitor
Node & Client Password:	fms

FMS Client Client Client Node Windows Help				
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Configured				
S MainNode				
Configuration	Mirror Database			
<ul> <li>Monitor Summary Monitor Settings Buddy Settings</li> </ul>	Connection			
Database Settings Mirror Database Settings	Database Type	QPSQL	•	
Reporting Settings     Security	Server Address	192.168.1.50	Port (0=Default) 5432	Test Connection
	Database Nam	e fms01	Enable Mirroring 🗸	
	Node User moni	itor	Client User monitor	
	Password •••		Password •••	
VOk XCancel				
Messages				
Node Date/Time	<ul> <li>Source</li> </ul>	Туре	Message	
Local 19-03-2015 12:5	i8:09 Local	Ok	Monitor Has Connected MainNode fro	om 192.168.1.6
Local 19-03-2015 12:5	i8:08 Local	Ok	Monitor Has Connected MainNode fro	om 192.168.1.6
				10.03.2015.13-03-41

18. Go to Buddy Settings and check "**Exit if Node Active**" then select from the dropdown list "**MainNode**".

FMS Client Client Client Node Windows Help			
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Configured			
Configuration	Buddy 1		
<ul> <li>Monitor Summary Monitor Settings Buddy Settings</li> </ul>	Enable		· · · · · · · · · · · · · · · · · · ·
Database Settings Mirror Database Settings Reporting Settings	Buddy 2		
<ul> <li>Security</li> </ul>	Enable		
	Buddy 3		
	Enable		•
	Buddy Behaviour		
✓Ok XCancel	Take Over After (n ✔ Exit if Node Ac	nins) tive	1 🗘
Vessages			
Node Date/Time	<ul> <li>Source</li> </ul>	Туре	Message
Local 19-03-2015 12:	58:09 Local	Ok	Monitor Has Connected MainNode from 192.168.1.6
Local 19-03-2015 12:	58:08 Local	Ok	Monitor Has Connected MainNode from 192.168.1.6
			19-03-2015 13:04:29

- *Note*: Takeover time = 1 mins means "MainNodeBuddy" node will automatically take over one minute after the main monitor dies.
- 19. Click **Ok** and confirm save.
- 20. Click **Yes** to reboot the monitor.

21. Configure FMS5 with all the instruments, sample points, and other configurations needed for your installation.

FMS Client Client lient Node V	t Vindows Help							>
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onfigured						Units Status		(
MainNode						SimulatedAD	c	
CO2     Value: 0.00 ppm     Value: 0.00 ppm     Value     Value		LAF_Room 0.5 : 4	1_110 6 C/cuft	✓ T Value	: 0.0 °C	SimulatedOPC		
						Statistics		(
						Sample Status	Tag Status	Alarm 4
						Name	Value	
essages								
Node	Date/Time	• • S	Source	Туре	Message			
Local	19-03-2015 13	3:05:43 Local	Ok		Monitor Has Connected MainNe			
Local	19-03-2015 13	3:05:40 Local	Ok		Monitor Has Connected MainNe			
							19-03-2015	13:06:14

## **Buddy Computer Configuration Instructions**

- 1. Start pgAdmin III on the Watchdog Computer.
- 2. Add the local IP address to the file pga\_hba.conf. To start:
  - Under Menu File, select Open pga\_hba.conf
  - Browse for this file within the Postgres 9.3 installation folder (C:\PROGRAM FILES (X86)\POSTGRESQL\9.3\DATA)
- 3. On the Backend Access Configuration Editor screen, double click on the last line as shown below.



4. Enter the following values:

Elient Access Configuration					
Enabled					
Туре	host				
Database	all				
User	all				
IP Address	192.168.1.50/32				
Method	trust				
Option					
Help	OK Cancel				

Note: The IP address is your local Computer IP Address

- 5. Click OK.
- 6. Click the Save icon and exit.

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File Edit Help								
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Туре	Database	User	IP-Address	Method	Option			
🗹 host	all	all	127.0.0.1/32	md5				
🗹 host	all	all	::1/128	md5				
🗌 host	replication	postgres	127.0.0.1/32	md5				
🗖 host	replication	postgres	::1/128	md5				
🗹 host	all	all	10.0.0.100/32	md5				
🗹 host	all	all	192.168.1.50/32	trust				
💌 host	all	all	192.168.1.6/32	trust				
•						Þ		
Configurati	on read from C:\Program	Files (x86) \PostgreSQL \	9.3\data\pg_hba.conf					

- 7. Repeat Step 3 to add the "MainNode" IP address to PostgreSQL.
- 8. Enter the following values:

🧱 Client A	ccess Configuration	×
Enabled		
Туре	host	•
Database	all	•
User	all	•
IP Address	192.168.1.6/32	
Method	trust	•
Option		
Help	ок	Cancel

9. Click OK.

10. **Save** and exit the Backend Access Configuration Editor.

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File Edit	File Edit Help								
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Туре	Database	User	IP-Address	Method	Option				
🗹 host	all	all	127.0.0.1/32	md5					
🗹 host	all	all	::1/128	md5					
🗌 host	replication	postgres	127.0.0.1/32	md5					
🗖 host	replication	postgres	::1/128	md5					
🔽 host	all	all	10.0.0.100/32	md5					
🔽 host	all	all	192.168.1.50/32	trust					
🗹 host	all	all	192.168.1.6/32	trust					
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Configuratio	on read from C:\Program	Files (x86) \PostgreSQL \9	.3\data\pg_hba.conf			li.			

- 11. Restart PostgreSQL 9.3 Service.
- 12. Copy from the Main Computer to the Buddy Computer the following files and rename them as follows:
  - C:\FMS5\Node\MainNode.xml to Buddy Computer C:\FMS5\Node\MainNodeBuddy.xml
  - C:\FMS5\Config\NodeLocal.xml to Buddy Computer C:\FMS5\Config\BuddyNodeLocal.xml
  - If using security, copy C:\FMS5\Config\NodePassword.xml to the Buddy Computer C:\FMS5\Config\BuddyNodePassword.xml
- 13. The file containing all AeroTrak+ Active Air Sampler program configured (C:\FMS5\Config\AASAllPrograms.xml) on the Main Computer should be periodically copied to the Buddy Computer to ensure the Buddy Configuration remains up-to-date unless no modifications to the programs are allowed after completing FMS Configuration and validation.
- 14. Create the Watchdog Node. The only role of this node will be to monitor MainNode. To do so, edit the file "C:\FMS5\Bin\Guard.ini" on the Buddy Computer.
  - Append to the existing line the following extension: -node=Watchdog
  - The line will be: C:\FMS5\bin\Monitor -node=Watchdog
- 15. With Microsoft<sup>®</sup> Windows<sup>®</sup> Explorer<sup>®</sup> browser, navigate to C:\FMS5\Node and rename the existing *YourComputerName.xml* file to Watchdog.xml
- 16. Edit Watchdog.xml and replace any occurrence of YourComputerName with Watchdog.
- 17. Restart the GuardService.
- 18. Start FMS5 Client.

19. Go to **Buddy Settings** and enter the following values:

Buddy 1 Enabled:	Checked
Select:	MainNode

Enter the following command line:

C:\FMS5\BIN\MONITOR.EXE -node=MainNodeBuddy -localfile=BuddyNodeLocal.xml - request=4005

If using security, enter the following command line:

C:\FMS5\BIN\MONITOR.EXE -node=MainNodeBuddy -localfile=BuddyNodeLocal.xml - request=4005 -passwordfile=BuddyNodePassword.xml

Take Over After:	1
Exit if Node Active:	Checked & Select MainNode

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MainNode					
E	Buddy 1				
ary	✓ Enable		ſ	MainNode	•
S	C:\FMS5\BIN\W	IONITOR.EXE	-node=MainNodeBuddy -localfile=	=BuddvNodeLocal.xml -request=4005	
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	Enable				· · · · · · · · · · · · · · · · · · ·
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	Take Over After	(mins)		1	\$
Cancel	Exit if Node A	Active		MainNode	-
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Date/Time	<ul> <li>Source</li> </ul>	Туре		Message	
19-03-2015 13:31:	44 Local	Ok	Monitor Has Connected Wa	atchdog from 192.168.1.50	
19-03-2015 13:31:	43 Local	Ok	Monitor Has Connected Ma	ainNode from 192.168.1.6	
19-03-2015 13:31:	43 Local	Ok	Monitor Has Connected Wa	atchdog from 192.168.1.50	
	✓ MainNode       ary     F       ary     s       ings     e       gs     E       ings     E       mgs     E    <	MainNode         ary         s         Buddy 1         Buddy 2         Buddy 3         Buddy 8ehaviour         Take Over After (         V         Exit if Node A         Date/Time<	MainNode       Buddy 1         ary       Enable         c:YEMS5/BINMONITOR.EXE       Buddy 2         Buddy 2       Enable         Buddy 3       Enable         Buddy Behaviour       Take Over After (mins)         ✓ Exit if Node Active       Vert if Node Active         Date/Time ▲ Source       Type         19-03-2015 13:31:44       Local       Ok         19-03-2015 13:31:43       Local       Ok	MainNode       Buddy 1         ary       Enable         gs       C.\FMS5\BIN\MONITOR.EXE -node=MainNodeBuddy.localfiles         ngs       Exitings         ngs       Enable         Buddy 2       Enable         Buddy 3       Enable         Buddy Behaviour       Image: Section (Section	✓ MainNode         ary         s         gs         e Settings         ngs         e Settings         ngs         e Settings         ngs         e Settings         Buddy 2         Buddy 3         Enable         Buddy 3         Enable         Buddy Behaviour         Take Over After (mins)         1         VCancel         Ver After (mins)         1         vCancel         Date/Time         Source       Type         Monitor Has Connected Watchdog from 192.168.1.50         19-03-2015 13:31:43       Local       Ok         Monitor Has Connected Watchdog from 192.168.1.50

- 20. Go to **Monitor Settings** and enter the License Key for the Watchdog Node.
- 21. Click **Ok** and confirm save.
- 22. Click **Yes** to reboot the monitor.
- 23. Configure one simulated unit and sample point on the Watchdog Node; these names should be unique. The unit's name is "WatchDog\_Unit" and "WatchDog" is the sample point.
- 24. Stop the Guard Service on the Main Monitor and wait until the Buddy Node starts on the Buddy Computer.

25. Once the Buddy Node has started, open Buddy's configuration window and go to **Database Settings**. Point the Buddy Node's main database to the Buddy Computer by entering the following values:

Server Address:	192.168.1.50
Port:	5432
Node & Client User:	monitor
Node & Client Password:	fms

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ient Node V	Vindows Help	🧶	11 🗛 🖂 🕹		
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onfigured					
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onfiguration		Database			
<ul> <li>Monitor Sum Monitor Settin Buddy Settin</li> </ul>	imary ings	Connection			
Database Se Mirror Databa	ase Settings	Database Type	QPSQL	•	
<ul> <li>Reporting Se</li> <li>Security</li> </ul>	ettings	Server Address	192.168.1.50	Port (0=Default) 5432 🌲	Test Connection
5		Database Nam	e fms01		
		Nede Llear men	itor	Client Liner meniter	
		Node Oser mon	itor	Client Oser Infolitor	
		Password •••		Password •••	
₩Ok	Cancel				
essages					
Node	Date/Time	<ul> <li>Source</li> </ul>	Туре	Message	
Local	19-03-2015 13:2	7:05 Local	Ok	Monitor Has Connected Watchdog f	rom 192.168.1.50
Local	19-03-2015 13:2	7:03 Local	Ok	Monitor Has Connected MainNode f	rom 192.168.1.6
Local	19-03-2015 13:2	7:03 Local	Ok	Monitor Has Connected Watchdog f	rom 192.168.1.50

26. Go to **Mirror Database Settings** and enter the following values to point the Buddy Node's mirror database to the Main Computer:

Database Type:	QPSQL
Server Address:	192.168.1.6
Port:	5432
Database Name:	fms01
Enable Mirroring:	Checked
Node & Client User:	monitor
Node & Client Password:	fms

FMS Client Client ient Node W	t /indows Help				
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Mirror Database Settings Reporting Settings I Security		Server Add	ress 192.168.1.6 lame fms01	Port (0=Default) 5432 Enable Mirroring	Test Connection
		Node User r	nonitor	Client User monitor Password •••	
₩Ok	Cancel				
ssages					
Node	Date/Time	<ul> <li>Source</li> </ul>	е Туре	Messag	le
Local	19-03-2015 13:23	':05 Local	Ok	Monitor Has Connected Watchdog	from 192.168.1.50
Local	19-03-2015 13:23	:03 Local	Ok	Monitor Has Connected MainNode	from 192.168.1.6
Local	19-03-2015 13:23	03 Local	Ok	Monitor Has Connected Watchdog	from 192 168 1 50

27. Start the Guard Service on the Main Computer. When the Main Node starts, Buddy Node should detect this and automatically shut down. If the Buddy Node fails to start, recheck all configuration settings. Ensure "**Exit if Node Active**" is enabled and the Main Node is selected in the drop-down list in Configuration.

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ient Node V	Vindows Help				
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nfigured					
Watchdog	🥝 MainNode				
VatchDog Value : 0.0	00				
Node	Date/Time 🔺	Source	Туре	Message	
Local	19-03-2015 13:33:56	Local	Ok	Monitor Has Connected Watchdog from 192.168.1.50	
Watchdog	19-03-2015 13:33:46	Watchdog	Warning	Monitoring Node Has Stopped	
Local	19-03-2015 13:31:44	Local	Ok	Monitor Has Connected Watchdog from 192.168.1.50	
Local	19-03-2015 13:31:43	Local	Ök	Monitor Has Connected MainNode from 192.168.1.6	
				19-03-2015 13:3	4:2

#### **Additional Notes**

- **Security Configuration**—By using the Watchdog Node as the password server, the need to maintain password files on both computers is removed. Note that should the Buddy Computer fail, only super-users will be able to log in to the Main Monitoring Node. However, it would normally be the case that the Buddy Computer is recovered as soon as practically possible allowing normal user login to resume.
- The node configuration from the Main Computer should be periodically copied to the Buddy Computer to ensure the Buddy Configuration remains up-to-date. Be sure to update the Buddy Node's main and mirror database configuration.
- The file containing all AeroTrak+ Active Air Sampler program
   (C:\FMS5\Config\AASAllPrograms.xml) on the Main Computer should be periodically copied to the Buddy Computer to ensure the Buddy Configuration remains up-to-date unless Main Computer Node does not contain any configured AeroTrak®+ Active Air Sampler Sample Point.
- When one or more AeroTrak+ Active Air Sample Program are running their running settings will be stored in the database inside a table called **aas\_programs\_details**. Storing running settings inside the database allow the Buddy Computer to continue these programs as soon as the Buddy takes over.
- The main node and the Buddy node MUST be on the same network and subnet.

# **Revision History**

Revision	Released	Description
А	10 April 2015	Initial Release
В	20 November 2017	Minor changes
С	14 July 2021	Adapted for AeroTrak+ Active Air Sampler 7010.
D	6 May 2024	Description and Prerequisites on page 2 have been revised

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