ESTEEM
SECURE WIRELESS NETWORKING

TECHNICAL BULLETIN
AB Logix Best Practices - Wireless

Limited Bandwidth Radio Setup on Logix5000 to Logix5000 Systems (Compact Logix/Control Logix)

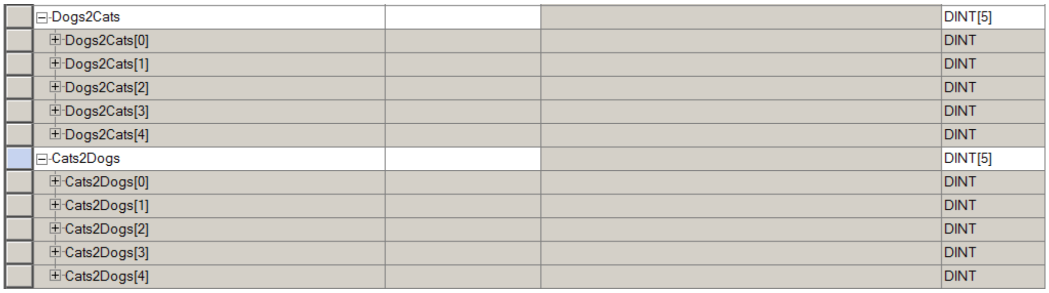
Logix5000 platforms are designed to provide high performance Ethernet interconnectivity between Logix processors. This interconnectivity comes in two forms, “Implicit” and “Explicit”. With limited bandwidth systems only Explicit, those which use programmed Message (MSG) instructions, provide the control to limit over burdening communications. Therefore, best performance and reliability can be expected using Explicit messaging.
Reasonable knowledge of programming within the Logix5000 environment is understood and this document does not replace instructional courses or documentation intended for training.

Best Practices:
When possible these practices will result in the best and most reliable radio system performance:

- Include all data to be transmitted into one packet. For example, a DINT[5].
- If you have a UDT based Control tag you may want to convert it to a standard DINT array (COP for example). This can be immediately converted back in the destination processor.
- Use one or more DINT words within the packet for any Boolean values.
- Use ESTeem frame size calculations to properly size total frame size in the radios.
- There are two general choices, single processor messaging or multiple:
    - Single, best suited for cyclic messages and can handle both writing and reading. The advantage of this form is that it keeps all messages on a clean sequence time base very simply avoids causing too much traffic.
    - Multiple, more overhead required to minimize over tasking radios with too much traffic. Better suited for exception based messaging where no traffic occurs until a change of state.
- Make Control Tag locations shared between processors identical names (Keep it simple).

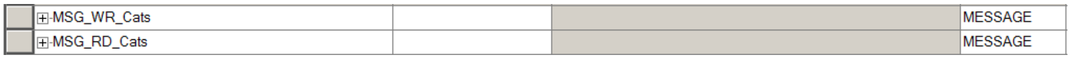
Programming:
For Example purposes we have two processors
Processor 1 = Dog (primary) Processor 2 = Cat (secondary)

1) Create Identical Controller Scoped Tags in both processors:



	⊟Dogs2Cats			DINT[5]
	⊞Dogs2Cats[0]			DINT
	⊞Dogs2Cats[1]			DINT
	⊞Dogs2Cats[2]			DINT
	⊞Dogs2Cats[3]			DINT
	⊞Dogs2Cats[4]			DINT
	⊟Cats2Dogs			DINT[5]
	⊞Cats2Dogs[0]			DINT
	⊞Cats2Dogs[1]			DINT
	⊞Cats2Dogs[2]			DINT
	⊞Cats2Dogs[3]			DINT
	⊞Cats2Dogs[4]			DINT

2) Create Message Tags

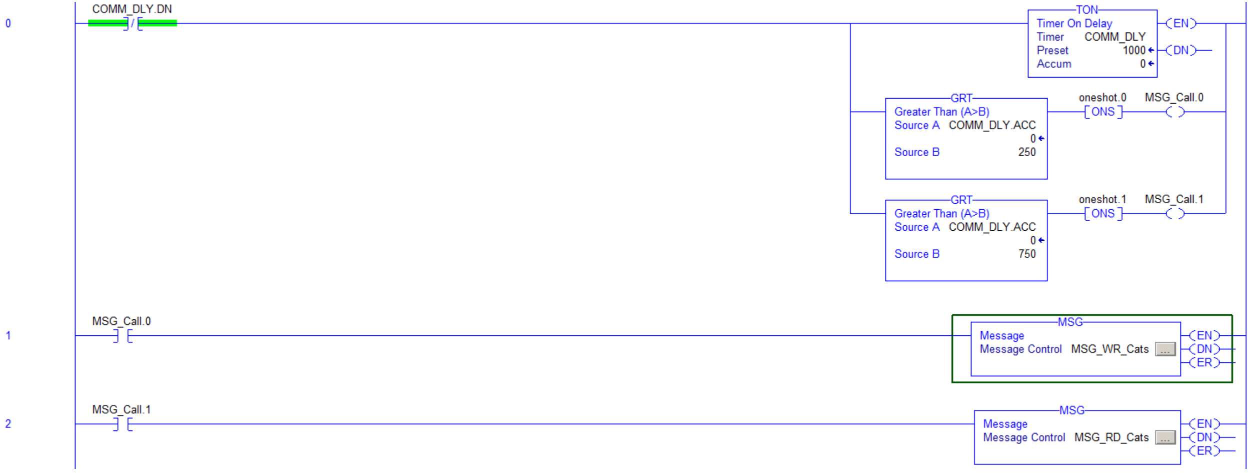


	⊞MSG_WR_Cats			MESSAGE
	⊞MSG_RD_Cats			MESSAGE

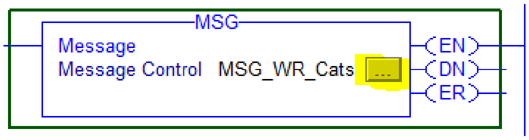
3) Build Program in area that is scanned:

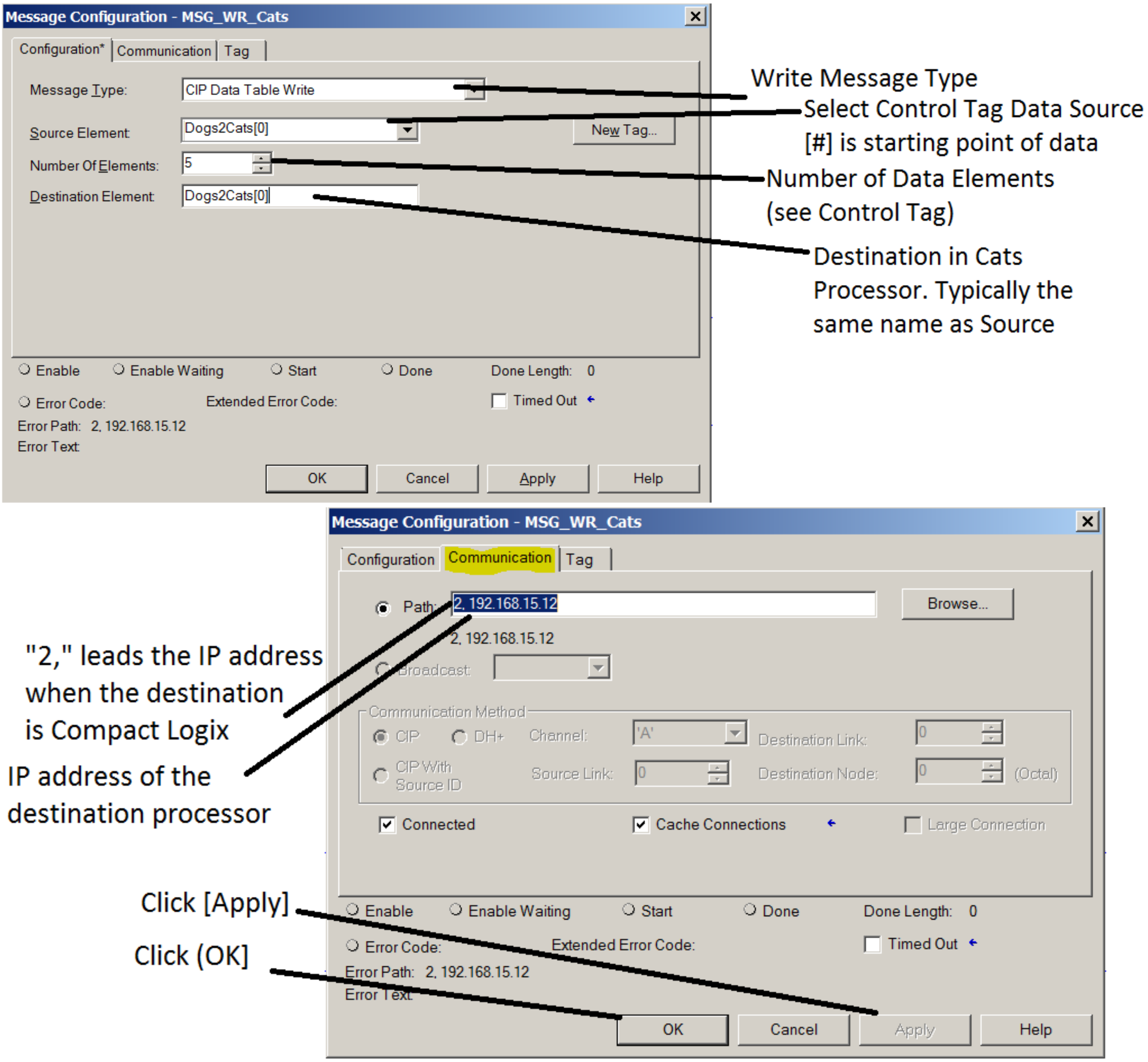
Rung 0 – Time control for messages, recycling timer 1 second.

Rung 1 – MSG_Call.0 triggers MSG that will write data to Cat processor
Rung 2 – MSG_Call.1 triggers MSG that will read data from Cat processor



4) Open MSG instruction in rung 1(Write from Dogs Processor to Cats Processor).





Message Configuration - MSG_WR_Cats

Configuration* | Communication | Tag

Message Type: CIP Data Table Write

Source Element: Dogs2Cats[0]

Number Of Elements: 5

Destination Element: Dogs2Cats[0]

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

Error Path: 2, 192.168.15.12

Error Text:

Write Message Type

Select Control Tag Data Source
[#] is starting point of data

Number of Data Elements
(see Control Tag)

Destination in Cats
Processor. Typically the
same name as Source

Message Configuration - MSG_WR_Cats

Configuration | Communication | Tag

● Path: 2, 192.168.15.12

2, 192.168.15.12

○ Broadcast:

Communication Method

● CIP ○ DH+ Channel: 'A' Destination Link: 0

○ CIP With Source ID Source Link: 0 Destination Node: 0 (Octal)

☑ Connected ☑ Cache Connections □ Large Connection

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

Error Path: 2, 192.168.15.12

Error Text:

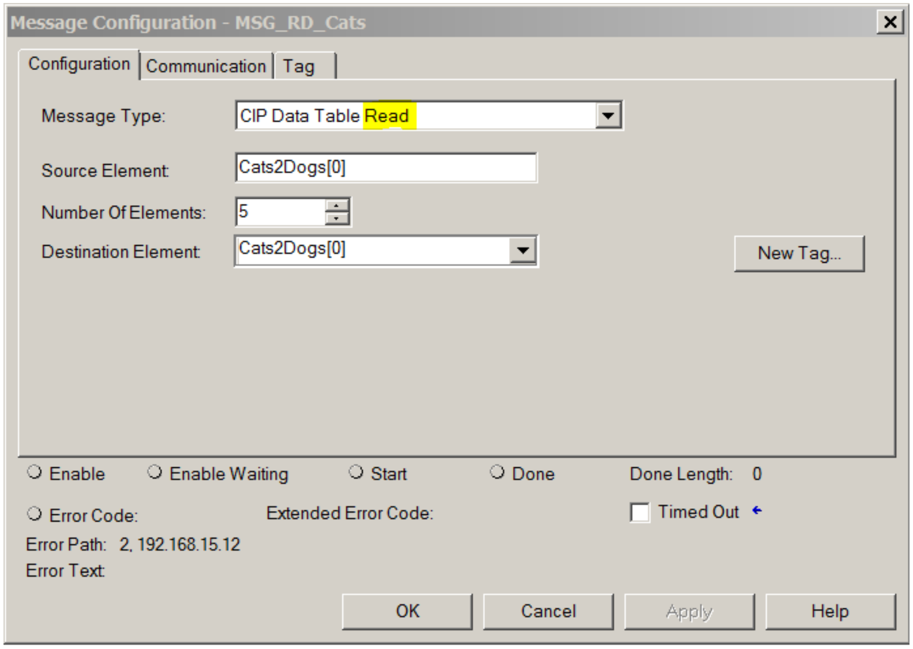
"2," leads the IP address
when the destination
is Compact Logix

IP address of the
destination processor

Click [Apply]

Click (OK]

5) Open MSG Instruction on Rung 2 (read from Cats Processor to Dogs Processor.
Instructions are nearly identical except this is CIP Data Table Read not …Write:



Message Configuration - MSG_RD_Cats

Configuration | Communication | Tag

Message Type: CIP Data Table Read

Source Element: Cats2Dogs[0]

Number Of Elements: 5

Destination Element: Cats2Dogs[0]

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

Error Path: 2, 192.168.15.12

Error Text:

Repeat setup of IP address on Communications Tab.

NOTE: With this design multiple processors can be added to the communication scheme, each with a different radio and processor. The same rules apply, for example, should you wish to add processor “Mouse”. This can be as easily communicated with by Dog as by Cat and the physical layout of the application my dictate the use of one to connect data to the other, either for reasons of distance or other limitations.

Testing.
You may start initial testing with an Ethernet switch to confirm programming. If doing so be certain radios and other paths are disconnected.
After confirming that the program reliably writes and reads data between processors thru an Ethernet switch disconnect this and connect your radios.

NOTE: This document does not address radio setup, notices, warnings, advisories or ESTeem instructions in the setup and operation of their radios. Please refer to ESTeem documentation for a clear understanding of proper setup procedures for the radio sets this is being applied to.