



CC-Link Analysis using the CC-Link ComProbe with the NetDecoder Software

Features and User Guide

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1 Introduction

This document covers Frontline's new CC-Link ComProbe. The CC-Link ComProbe is an addition to Frontline's NetDecoder software. Using the new ComProbe, you can now capture and analyze CC-Link protocol messages.

The CC-Link ComProbe has a 5-pin screw terminal connector to connect to the CC-Link network (Figure 1). It uses a USB 2.0 port to interface with the analysis PC.



Figure 1

What we are going to do in this guide is show you how to load the ComProbe drivers, configure the Hardware Settings, and we will also explain what you will see on the CC-Link Dashboard.





2 Driver Installation

The first thing you have to do is load the **CC-Link ComProbe** device drivers.

- 1. Plug the ComProbe into the PC.
- 2. On the first dialog select "No, not this time" and "Next" (Figure 2).

Figure 2



3. Choose "Install from a list or specific location (Advanced)" (Figure 3).

Figure 3







4. Select "Don't search. I will choose the driver to install." and "Next" (Figure 4).

Figure 4

Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM)
✓ Include this location in the search:
C:\Program Files\Elan Digital Systems\SD Tracer\dri 👻 🛛 Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< <u>B</u> ack <u>N</u> ext > Cancel

5. Select "Next" (Figure 5).

Figure 5

Found New Hardware Wizard	
Hardware Type.	
Select a hardware type, and then click Next. Common <u>h</u> ardware types:	
Show All Devices Show All Device Show All Debugger Device Show Allen-Bradley PCMCIA Family Allen-Bradley PCMCIA Family Allen-Bradley PCMCIA Family Show Allen-Bradley PCMCIA Family Show All Device Class Batteries Show All Device Class Computer Computer Computer Computer	
[< Back Next > Cancel





Figure 6



7. Click on "Browse" (Figure 7).









8. Locate the "Serial_ComProbes.inf" located at C:\Program Files\Frontline Test System II\Frontline NetDecoder ####\Drivers\Serial ComProbes (Figure 8).

Figure 8

Locate File					? 🔀
Look in: ն	Serial ComProbes	S	ø	Þ	 -
amd64					
Serial Com	Probes inf				
	riobes.ini				
			_	_	
File name:	Serial_ComProbes.inf	4	~		Open
Files of type:	Setup Information (*.inf)		~		Cancel

- 9. Select "Serial_ComProbes.inf" and "Open" (Figure 8).
- 10. Then select "OK" (Figure 9).

Figure 9







Figure 10

Found New Hardware Wizard
Select the device driver you want to install for this hardware.
Select the manufacturer and model of your hardware device and then click Next. If you have a disk that contains the driver you want to install, click Have Disk.
Model
Frontline CC-Link ComProbe
This driver is not digitally signed! <u>I ave Disk</u> <u>I ave Disk</u>
< <u>B</u> ack <u>N</u> ext > Cancel

12. If you see a system warning, ignore and select "Yes" (Figure 11).

Figure 11



The ComProbe drivers will be installed (Figure 12).









Figure 13



The first dialog will appear again (Figure 14).

Figure 14



You have to go through the entire process again to load the second device driver.





Important Note:

If you do not load the drivers for the CC-Link ComProbe the first time you insert it in the PC, the next time you plug it in, the *"Found New Hardware Wizard"* WILL NOT APPEAR. But you still have to load the ComProbe drivers.

To do so you have to:

1. Open Device Manager, select the "CC-Link ComProbe" under Other Devices (Figure 15).

Figure 15

🚇 Device Manager	
<u>File Action View H</u> elp	
BVD/CD-ROM drives Foppy disk controllers General State St	
Keyboards Mice and other pointing devices Modems Monitors Moni	3
Processors Processors Difference of the second s	

2. Right click and select "Update Driver" (Figure 16).

Hedele Balance	
Update Driver	I
Disable	
Uninstall	
Scan for hardware changes	
Properties	

Figure 16

Then the Hardware Wizard will appear and you can proceed with the driver installation.



3 Hardware Settings

When establishing CC-Link settings, if you have multiple ComProbes you must select which device to sniff. You do that with Hardware Settings.

Note: we do not recommend running more than one CC-Link sniffing session at a time on the same PC. CC-Link runs at a maximum baud rate of 10 Mbps. At that rate the PC will have significant performance issues while trying to capture data from multiple CC-Link ComProbes.

- 1. Connect the CC-Link ComProbe to an available USB port.
- 2. Start the analyzer.
- 3. Select Hardware Settings from Options menu on the Control Window.

🗿 CC-Link Har	dware Settings	×
Sniffer: CC-Link	ComProbe (FTE2000	4) 🔽
	Firmware Version:	17
ОК	Cancel	Help

- 4. Choose a ComProbe device to use from the drop-down list. If you have only one ComProbe connected to your PC, that device is used automatically and you don't need to select it.
- 5. Select "OK" to save the settings, "Cancel" to close the dialog without saving the settings, or "Help" to access the electronic help file.





4 I/O Settings

The I/O Settings dialog is used to set the data rate for a CC-Link device.

- 1. Connect the CC-Link ComProbe to an available USB port.
- 2. Start the analyzer.
- 3. Select "I/O Settings" from the Options menu on the Control Window.

I/O Settings	×
Choose Data Rate:	10 Mbps 🖌
Set Ca	ncel Help

4. Select a "data rate" from the drop-down list.

The options conform to standard CC-Link Baud Rates and include:

- 156 Kbps
- 625 Kbps
- 2.5 Mbps
- 5 Mbps
- 10 Mbps
 - 5. Select "Set" to save the rate, "Cancel" to close the dialog without saving the rate, or "Help" to access the electronic help file.



5 Overview of CC-Link Dashboard in the NetDecoder Analyzer

The CC-Link Dashboard Dialog contains two main features:

- 1. An Active Device Grid
- 2. An Error Log

CC-Link Statistics - clpa-small-file.cfa											
			Active	e Devic	es on l	Networ	k		Error Log		
	1	2	3	4	5	6	7	8	Frame Node Event		
									1454 50 Parameter Receive Error;		
	9	10	11	12	13	14	15	16	1560 50 Parameter Receive Error;		
	Ŭ					17		10	1666 50 Parameter Receive Error;		
	17	10	10	- 20	- 24	- 22	- 22	24	1670 52 Parameter Receive Error;		
	17	18	19	20	21	22	23	24	1776 52 Parameter Receive Error;		
									1882 52 Parameter Receive Error;		
	25	26	27	28	29	30	31	32	1988 52 Parameter Receive Error;		
									4528 50 Parameter Receive Error;		
	33	34	35	36	37	38	39	40	4634 50 Parameter Receive Error;		
						00			4740 50 Parameter Receive Error;		
									4846 50 Parameter Receive Error;		
	41	42	43	44	45	46	47	48	4850 52 Parameter Receive Error;		
									4956 52 Parameter Receive Error;		
	49	50	51	52	53	54	55	56			
	57	58	59	60	61	62	63	64			
	Ne Co Oo Di: VV Sy Pr	ever pro onnecta ccupied sconne atch Do (stem F evious	esent ed Nod d Static ected N og Time fault Error	e on in Pro lode er Error	evious	Node					
									Packets: #5000 - 100%		

Figure 17: Overview of CC-Link Dashboard

5.1 Active Devices Grid

The device grid shows all 64 nodes on a CC-Link network with each node represented by a numbered square on the grid. The squares are color coded to indicate the state of the node.

- 1. Grey: Node Not Present on the network
- 2. Green: A Connected Node operating normally without errors
- 3. Light Green: An Occupied Station within a Previous Node.
- 4. Red: Disconnected Node
- 5. Orange: Node with a Watch Dog Timer Error
- 6. Yellow: Node with a System Fault
- 7. Blue: Node operating correctly but had a previous error



5.1.1 Nodes Not Present on the Network

		Active	Devic	ces on	Networ	ĸ			ror Log	
1	2	3	4	5	6	7	8	Frame	Node	Event
9	10	11	12	13	14	15	16			
17	18	19	20	21	22	23	24			
25	26	27	28	29	30	31	32			
33	34	35	36	37	38	39	40			
41	42	43	44	45	46	47	48			
49	50	51	52	53	54	55	56			
57	58	59	60	61	62	63	64			
Ne Co Oc Di: VVi Sy	ever pr prinecte scoupiee sconne atch D (stem F evious	esent ed Nod d Static ected N og Tim Fault Error	e on in Pr lode er Erro	evious r	Node					

Figure 18: Network with Only One Node

In Figure 18 above, we see that there is only one node and all other nodes are grayed out to show that they are absent on the network.



5.1.2 Connected Nodes Operating Normally without Errors

Figure 19: Grid with Connected Nodes and Occupied Stations

Figure 19 shows a fully loaded CC-Link network with all 64 nodes present. All the nodes in green color indicate nodes operating normally without any errors.



5.1.3 Occupied Station within a Previous Node

CC-Link supports the concept of Occupied Stations, in which a single node on the network can be considered to have multiple stations. Once again referring to Figure 19 above, we see that Node 4 is an Occupied Station. This means that Node 3 is configured to have two occupied stations: Node 3 and Node 4. Similarly, Nodes 5, 7, 9, 11, 13, 20, 22, 24, 26, 28, and 30 have two occupied Stations. This information is also conveyed in Frame Display.

🗣 Frame Display - clpa-small-file.cfa											
File Edit View Format Filter Bookmarks Options Window Help											
🍖 🚰 🔎 🗽 💁 🍸 🐺 🥪 🤁 🏥 🦵 💷 📖 Filter: Include each frame where the protocol "CC-Link" exists											
E T T T C-Link with Auto-											
Unfiltered	Errors C	C-Link									
Bookmark	Frame#	A1	A2	NO. of Stat	ions Timestamp	<u>~</u>					
•	1	Master: Polling & Refresh Data	1		2/16/2011 12:09:09.531000 PM	-					
•	2	Slave: Response of Polling & Refresh Data	1	1	2/16/2011 12:09:09.531016 PM						
•	3	Master: Polling Data	2		2/16/2011 12:09:09.531028 PM						
•	4	Slave: Response of Polling Data	2	1	2/16/2011 12:09:09.531044 PM						
•	5	Master: Polling Data	3		2/16/2011 12:09:09.531056 PM						
•		Slave: Response of Polling Data			2/16/2011 12:09:09.531088 PM						
•	7	Master: Polling Data	5		2/16/2011 12:09:09.531100 PM						
•	8	Slave: Response of Polling Data	5	2	2/16/2011 12:09:09.531133 PM						
•	9	Master: Polling Data	7		2/16/2011 12:09:09.531145 PM						
•	10	Slave: Response of Polling Data	7	2	2/16/2011 12:09:09.531177 PM						
•	11	Master: Polling Data	9		2/16/2011 12:09:09.531189 PM						
•	12	Slave: Response of Polling Data	9	2	2/16/2011 12:09:09.531221 PM						
•	13	Master: Polling Data	11		2/16/2011 12:09:09.531233 PM						
•	14	Slave: Response of Polling Data	11	2	2/16/2011 12:09:09.531265 PM						
•	15	Master: Polling Data	13		2/16/2011 12:09:09.531277 PM						
•	16	Slave: Response of Polling Data	13	2	2/16/2011 12:09:09.531309 PM						
•	17	Master: Polling Data	15		2/16/2011 12:09:09.531321 PM						
•	18	Slave: Response of Polling Data	15	1	2/16/2011 12:09:09.531337 PM						
•	19	Master: Polling Data	16		2/16/2011 12:09:09.531349 PM						
•	20	Slave: Response of Polling Data	16	1	2/16/2011 12:09:09.531365 PM						
•	21	Master: Polling Data	17		2/16/2011 12:09:09.531377 PM						
						×					
Total Frames:	5,000 Fra	mes Filtered In: 5,000 Frame #s Selected: 6; (1	total)								
For Help Press	; F1										

Figure 20: Frame Display Showing Number of Occupied Stations

In Figure 20, we can see in Frame 6 that Node 3 has two occupied stations. This means that node 4 is actually an occupied station in node 3. Therefore, after a response from Node 3 in Frame 6, the Master then polls Node 5 and Not node 4. In Frame 8, Node 5 responds and there is information that it also occupies two stations. This implies that node 6 is an occupied station.



5.1.4 Disconnected Node

		Active	Devic	es on l	Vetwor	k	Error Log			
1	2	3	4	5	6	7	8	Frame Node Event		
·					-		-	325092 61 Disconnected - Master Retries;		
0	10	11	12	12	14	15	10	325198 61 Disconnected - Master Retries;		
3	10		12	13	14	15	10	325304 61 Disconnected - Master Retries;		
								325410 61 Disconnected - Master Retries;		
17	18	19	20	21	22	23	24	325516 61 Disconnected - Master Retries;		
								325622 61 Disconnected - Master Retries;		
25	26	27	28	29	30	31	32	325728 61 Disconnected - Master Retries;		
								325834 61 Disconnected - Master Retries;		
22	24	25	26	27	20	20	40	325940 61 Disconnected - Master Retries;		
55	34	33	30	37	30	33	40	326046 61 Disconnected - Master Retries;		
								326152 61 Disconnected - Master Retries;		
41	42	43	44	45	46	47	48	326258 61 Disconnected - Master Retries;		
								326364 61 Disconnected - Master Retries;		
19	50	51	52	53	54	55	56	326470 61 Disconnected - Master Retries;		
								326576 61 Disconnected - Master Retries;		
57	59	59	60	61	62	63	64	326682 61 Disconnected - Master Retries;		
	- 30	33	00	01	02	0.0	04	326788 61 Disconnected - Master Retries;		
_								326894 61 Disconnected - Master Retries;		
Ne	ever pr	esent						327000 61 Disconnected - Master Retries;		
Co	nnecte	ed Nod	е					327106 61 Disconnected - Master Retries;		
10	cunier	1 Statio	n in Dr	avioua	Node			327212 61 Disconnected - Master Retries;	_	
Occupied Station III Previous Node							327318 61 Disconnected - Master Retries;			
Disconnected Node							327424 61 Disconnected - Master Retries;			
Watch Dog Timer Error							327530 61 Disconnected - Master Retries;	_		
System Fault 327636 61 Disconnected - Master Retries;										

If a properly working node gets disconnected for any reason, then the Dashboard shows the node marked in red.

Figure 21: Node Disconnected and Master Retries

Figure 21 shows a network in which Node 61 was pulled out of the network. The Dashboard marks the node in red and the Error Log shows the exact Frame number at which the Master is retrying to poll the node 61. The Error Log shows the Frame number, the node, and the error event that happened on that frame.



In Frame Display, we can see consecutive Master Poll frames. In Figure 22 below we can see Frames 327635 and 327636 are consecutive attempts by the Master to reestablish connection with Node 61. When the Master does not get a response, the Dashboard marks a Disconnected node.

🥥 Frame I	Display - clpa	-node-pulled-out.cfa									
<u>Eile E</u> dit <u>V</u>	Elle Edit View Format Filter Bookmarks Options Window Help										
8	7 🔎 🔟	8 7 7 ⊗ 2 1	11 🕞 💷	Filter:	Include each frame where the protocol "CC-Link" exists						
		3 🔾 🗩 🔊 🖓 Find: 📃		- 🖌	Summary: CC-Link	CC-Link with Auto-					
Unfiltered	Bookmarks	CC-Link									
Bookmark	Frame#	A1	A2	NO. c	f Stations Timestamp	^					
•	327,632	Slave: Response of Polling Data	59	1	2/16/2011 11:32:46.504571 AM						
•	327,633	Master: Polling Data	60		2/16/2011 11:32:46.504583 AM						
•	327,634	Slave: Response of Polling Data	60	1	2/16/2011 11:32:46.504599 AM						
•	327,635	Master: Polling Data	61		2/16/2011 11:32:46.504611 AM						
•	327,636	Master: Polling Data	61		2/16/2011 11:32:46.504782 AM						
•	327,637	Master: Polling Data	62		2/16/2011 11:32:46.504953 AM						
•	327,638	Slave: Response of Polling Data	62	1	2/16/2011 11:32:46.504969 AM						
•	327,639	Master: Polling Data	63		2/16/2011 11:32:46.504981 AM						
•	327,640	Slave: Response of Polling Data	63	1	2/16/2011 11:32:46.504998 AM	-					
•	327,641	Master: Polling Data	64		2/16/2011 11:32:46.505009 AM	_					
•	327,642	Slave: Response of Polling Data	64	1	2/16/2011 11:32:46.505026 AM	~					
Frame 32	27,636: (CC-Link) Master Station: Po Slave Station Nur	Len=4 Jiling Data nber): 61	B 11111110 00 N A R Y	111101	00111001 00000011						

Figure 22: Frame Display showing consecutive Master Poll Data Frames

5.1.5 Node with a Watch Dog Timer Error

When a Slave node responds to a Master's Poll request, the response frame contains a Station Information (ST1) byte. The first bit of the ST1 byte indicates a Watchdog Timer error. If a node sends a frame with this bit set, then the node is marked in orange and error is logged in the error list.

5.1.6 Node with System Fault

When a Slave node responds to a Master's Poll request, the response frame contains a Station Information (ST1) byte. Apart from the Watchdog Timer bit and the Cyclic Transmission flag, this field contains 5 bits that provide information on the node's status. These fields include:

- 1. Switch Change Detection
- 2. Parameter Receive
- 3. Refresh Receive
- 4. Unit Error/Invalid Number of Points
- 5. Fuse Status

If any of these 5 flag bits are enabled, then the node is flagged as having a System Fault.



In this screen shot below, we see a Frame 20 from Node 16, in which all the ST1 bits are without any error:

File Edit Yew Format File Exclusion Exclusion File File File File File File File File CC-Link with Added Imitaread Errors CC-Link File File File File File CC-Link CC-Link Boolmak Framet A1 A2 N0. of Stations Timestamp CC-Link CC-Link Boolmak File CC-Link A2 N0. of Stations Timestamp CC-Link Boolmak File CC-Link A2 N0. of Stations Timestamp CC-Link Boolmak File CC-Link File CC-Link CC-Link CC-Link Boolmak File CC-Link File CC-Link CC-Link Boolmak File CC-Link File CC-Link CC-Link Boolmak File CC-Link File CC-Link CC-Link C2 Stave: Response of Foling Data T7 1 216/2011 1209.0531435 FM C2 Maste: Foling Data 18 1 216/2011 1209.0531432 FM C2 Maste: Foling Data 18 1 216/2011 1209.0531433 FM C2	🥥 Fran	me Display - cl	lpa-small-file.cfa				
Image: State: Normal Image: S	<u>Eile E</u> di	it <u>V</u> iew For <u>m</u> at	Filter Bookmarks Options Window	Help			
Collink with Auto France I Collink with Auto Transition Collink France I Collink France I Collink Collink		2 🔎	L 🔩 🔻 🐺 😂 🔁 🕯	1	Filter: 1	Include each frame where the protocol "CC-Link" exi	ists
Unitative forms CC-Link Bookmark Framet A1 A2 NO. of Stations Timestamp Image: Transfer of Poing Data 15 1 2/16/2011 12090 9531337 PM Image: Transfer of Poing Data 16 1 2/16/2011 12090 9531337 PM Image: Transfer of Poing Data 16 1 2/16/2011 12090 9531337 PM Image: Transfer of Poing Data 16 1 2/16/2011 12090 9531337 PM Image: Transfer of Poing Data 17 1 2/16/2011 12090 9531337 PM Image: Transfer of Poing Data 17 1 2/16/2011 12090 9531337 PM Image: Transfer of Poing Data 18 1 2/16/2011 12090 9531342 PM Image: Transfer of Poing Data 18 1 2/16/2011 12090 9531432 PM Image: Transfer of Poing Data 19 2/16/2011 12090 9531432 PM Image: Transfer of Poing Data Image: Transfer of Poing Data 19 2/16/2011 12090 9531432 PM Image: Transfer of Poing Data Image: Transfer of Poing Data 19 2/16/2011 12090 9531432 PM Image: Transfer of Poing Data Image: Transfer of Poing Data Image: Transfer of Poing D		— 🖬 🛤	(G (🔎	Summary: CC-Link	CC-Link with Auto
Bookmark Framett A1 A2 ND. of Stations Timestamp 18 Slave: Response of Poling Data 15 1 2/16/2011 12:09:05:31:33 PM 20 Slave: Response of Poling Data 16 2/16/2011 12:09:05:31:33 PM 20 Slave: Response of Poling Data 17 2/16/2011 12:09:05:31:33 PM 21 Master: Poling Data 17 2/16/2011 12:09:05:31:33 PM 22 Slave: Response of Poling Data 17 2/16/2011 12:09:05:31:33 PM 23 Master: Poling Data 18 2/16/2011 12:09:05:31:33 PM 24 Slave: Response of Poling Data 18 1 2/16/2011 12:09:05:31:42 PM 25 Master: Poling Data 19 2/16/2011 12:09:05:31:43 PM 000000000 CCLink: -A1: Slave: Station: Response of Poling Data 19 2/16/2011 12:09:05:31:43 PM 0000000000 -A2: 16 Slave: Atalon information 1(ST1) 000000000 1010100 10101010 10101010 -A2: 16 Slave: Atalon information 1(ST1) -A2: 16 Slave: Atalon information 1(ST1) -A2: 16 - State Tatalo	Unfilter	ed Errors C	:C-Link				
• 18 Slave: Response of Poling Data 15 1 2/16/2011 12:09:09:531337 PM • 19 Master: Poling Data 16 2/16/2011 12:09:09:531337 PM • 21 Master: Poling Data 16 1 2/16/2011 12:09:09:531365 PM • 22 Slave: Response of Poling Data 17 2/16/2011 12:09:09:531305 PM • 22 Slave: Response of Poling Data 17 1 2/16/2011 12:09:09:531305 PM • 23 Master: Poling Data 18 2/16/2011 12:09:09:531405 PM 2/16/2011 12:09:09:531405 PM • 24 Slave: Response of Poling Data 18 1 2/16/2011 12:09:09:531405 PM • 25 Master Poling Data 18 1 2/16/2011 12:09:09:531405 PM • 25 Master Poling Data 19 2/16/2011 12:09:09:531432 PM • • CCLink: -A1: Slave Station: Response of Poling Data 19 000100000 10101010 10101010 10101010 00000000 • -VD1 Eror: Not Detected	Bookma	ark Frame#	A1	A2	NO. of	Stations Timestamp	
19 Master: Poling Data 16 2/16/2011 12:09:08:531349 PM 20 Slave: Response of Poling Data 16 1 2/16/2011 12:09:08:531349 PM 21 Master: Poling Data 17 2/16/2011 12:09:08:531339 PM 22 Slave: Response of Poling Data 17 1 2/16/2011 12:09:08:53133 PM 23 Master: Poling Data 18 1 2/16/2011 12:09:08:531421 PM 24 Slave: Response of Poling Data 18 1 2/16/2011 12:09:08:531421 PM 25 Master: Poling Data 18 1 2/16/2011 12:09:08:531421 PM 25 Master: Poling Data 19 2/16/2011 12:09:08:531432 PM 26 CC:Link: - - 0:000:00:00 10:10:10:10:10:10:10:00:00:00:00:00 CC:Link: - - - 0:000:00:00 10:10:10:0 10:10:10:10:0:00:00:00:00 - - - - - - - - - - - - - - - - - - - - - - - - - - - <th>•</th> <th>18</th> <th>Slave: Response of Polling Data</th> <th>15</th> <th>1</th> <th>2/16/2011 12:09:09.531337 PM</th> <th></th>	•	18	Slave: Response of Polling Data	15	1	2/16/2011 12:09:09.531337 PM	
20 Slave Response of Poling Data 16 1 2/16/2011 12:09:09:531335 FM 21 Master: Poling Data 17 2/16/2011 12:09:09:531333 FM 22 Slave: Response of Poling Data 17 1 2/16/2011 12:09:09:531333 FM 23 Master: Poling Data 18 2/16/2011 12:09:09:531435 FM 24 Slave: Response of Poling Data 18 1 2/16/2011 12:09:09:531432 FM 25 Master: Poling Data 18 1 2/16/2011 12:09:09:531432 FM 25 Master: Poling Data 18 1 2/16/2011 12:09:09:531432 FM 26 CCLink: Len=10 00000000 00100000 1010101 00000000 CCLink: A1: Slave Station: Response of Poling Data 18 1 2/16/2011 12:09:09:531432 FM Image: CCLink: A1: Slave Station information 16:101 000 00000000 1010100 10101010 00000000 CCLink: A1: Slave Station: No Change Image: Completed Image: Complete Completed Image: Complete Completed	•	19	Master: Polling Data	16		2/16/2011 12:09:09.531349 PM	
21 Master: Polling Data 17 2/16/2011 12:09:09:531377 PM 22 Slave: Response of Polling Data 17 1 2/16/2011 12:09:09:531333 PM 23 Master: Polling Data 18 2/16/2011 12:09:09:531421 PM 24 Slave: Response of Polling Data 18 1 2/16/2011 12:09:09:531432 PM 25 Master: Polling Data 19 2/16/2011 12:09:09:531433 PM Image: Collink: A1: Slave: Staton: Response of Polling Data 19 000100000 10101010 10101010 00000000 A1: Slave: Staton: Response of Polling Data 000000000 10101010 00000000 10101010 10101010 000000000 - A2: 16 Slave: Staton: Response of Polling Data - A2: Slave: Staton: Image: Slave: Staton information 1(Si1) - Output for Nuncheching between Completed - Parameter Receive: Completed - Parameter Receive: Completed - Fitters Receive: Completed - Fitters Status: Normal - Reserved bit: 0 - Transmission Status: Norm	•	20	Slave: Response of Polling Data	16	1	2/16/2011 12:09:09.531365 PM	
• 22 Slave: Response of Poling Data 17 1 2/16/2011 12:09:09.531:005 PM • 23 Master: Poling Data 18 1 2/16/2011 12:09:09.531:005 PM • 24 Slave: Response of Poling Data 18 1 2/16/2011 12:09:09.531:032 PM • 25 Master: Poling Data 19 2/16/2011 12:09:09.531:032 PM • 25 Master: Poling Data 19 2/16/2011 12:09:09.531:032 PM • CCLink: Len=10 00000000 00100000 00100000 10101010 10101010 00000000 • CCLink: -A1: Slave Station: Response of Poling Data -A2: 16 00000000 1010100 10101010 00000000 00100000 10101010 00000000 10101010 00000000 10101010 10101010 00000000 10101010 10101010 00000000 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 10101010 101000 1010000000 10100000000 101000000000 <th>۲</th> <th>21</th> <th>Master: Polling Data</th> <th>17</th> <th></th> <th>2/16/2011 12:09:09.531377 PM</th> <th></th>	۲	21	Master: Polling Data	17		2/16/2011 12:09:09.531377 PM	
23 Master: Polling Data 18 2/16/2011 12/09/09/5314/05 PM 24 Slave: Response of Polling Data 18 1 2/16/2011 12/09/09/5314/21 PM 25 Master: Polling Data 19 2/16/2011 12/09/09/5314/32 PM Image: CCLink Len=10 CCLink: - A1: Slave Station: Response of Polling Data 19 2/16/2011 12/09/09/5314/32 PM Image: CCLink Len=10 - A2: 16 000000000 100000000 00100000 1010100 10101010 000000000 - A2: 16 Slave: station information 1 (S11) 000000000 100000000 10101010 000000000 - A2: 16 Slave: station information 2 (S12) Image: station information 2 (S12) </th <th>•</th> <th>22</th> <th>Slave: Response of Polling Data</th> <th>17</th> <th>1</th> <th>2/16/2011 12:09:09.531393 PM</th> <th></th>	•	22	Slave: Response of Polling Data	17	1	2/16/2011 12:09:09.531393 PM	
24 Slave: Response of Foling Data 18 1 2/16/2011 12/09/09.531433 FM 25 Master: Poling Data 19 2/16/2011 12/09/09.531433 FM CCLink: -A1: Slave Station Response of Foling Data 00010000 11111110 0000000 0010000 10101010 000000	•	23	Master: Polling Data	18		2/16/2011 12:09:09.531405 PM	
25 Master: Poling Usta 15 2/16/2011 12/03/03/14/35 PM Frame 20: (CC-Link: 00010000 00100000 10101010 10101010 00000000 CC-Link: - A2: 16 00000000 10101010 10101010 10101010 00000000 Slave station information 1 [ST1] - Word Error. Not Detected - Reserved bit: 0 - Cyclic Transmission Flag: Enabled - Slave station information 2 [ST2] - Extended Cyclic Setting Single setting (Ver.1 has no extender - Reserved bit: 0 - Transient Data: No - Transient Data: No - Transient Data: No - Transient Data: No - Transient Data: No - Wire NSAA.* U* U*U*A*B - Number of Occupied Stations: 1 - Reserved bit: 0 - Transient Data: No - Transient Data: No - Number of Stations: 1 - Reserved bit: 0 - Reserved bit: 0 - Transient Data: No - Reserved bit: 0 - Reserved bit: 0 - Transient Data: No - Number of Occupied Stations: 1 - RX: 0x as as 00: 00: Cud4ab - Wire NSAA.* U*U*U*A*B		24	Slave: Response of Polling Data	18	1	2/16/2011 12:09:09:531421 PM	
Freme 20: (CC-Link) Len=10 00010000 111111110 00000000 00100000 10101010 10101010 000000	•	25	Master: Polling Data	19		2/16/2011 12:09:09:531433 PM	×
		ink: 1: Slave Station: 1/ 2: 16 NVD Error: No Reserved bit: 0 Cyclic Transmis Switch Change Parameter Rec Refresh Recein Unit error/Inval Fuse Status: N Slave station inform Extended Cyclic Transmission S Reserved bit: 1 Transmert Date Unit error/Inval Keserved bit: 1 Transmist Data Womber of Occupie TX 0x aa aa 00 01 CRC: 0xd4ab	Response of Polling Data sation 1 (S11) x Detected 3 soino 1 Fag: Enabled 5 Detection: No Change serve: Completed we: Completed Mid no: of points: No formal nation 2 (S12) ic Setting: Single setting (Ver.1 has no exten 1 itatus: Normal 3 t: In eive: Disabled x: No ed Stations: 1 0	N 00000000 R P A N E R 10 fe 00 de V P A N E C C C C C C C C C C C C C	11010100 20 aa aa	10101011	
	For Help f	Press F1					

Figure 23: Node 16 without any System Faults

Figure 24 below shows a dashboard screenshot with Nodes 50 and 52 in System Fault. The Error Log also lists the exact frame number that has the error and the actual error. In this case, both Nodes 50 and Node 52 were responding with a 'Parameter Receive' error.



CC-Link Statistics - clpa-small-file.cfa										
		Active	e Devic	es on l	Networ	k		Error Log		
1	2	3	4	5	6	7	8	Frame Node Event		
								1454 50 Parameter Receive Error;		
a	10	11	12	12	14	15	16	1560 50 Parameter Receive Error;		
5	10		12	13	14	13	10	1666 50 Parameter Receive Error;		
								1670 52 Parameter Receive Error;		
17	18	19	20	21	22	23	24	1776 52 Parameter Receive Error;		
								1882 52 Parameter Receive Error;		
25	26	27	28	29	30	31	32	1988 52 Parameter Receive Error;		
								4528 50 Parameter Receive Error;		
- 22		05		07	- 20	- 20	10	4634 50 Parameter Receive Error;		
33	34	35	36	37	- 38	- 39	40	4740 50 Parameter Receive Error:		
								4846 50 Parameter Receive Error;		
41	42	43	44	45	46	47	48	4850 52 Parameter Receive Error:		
								4956 52 Parameter Receive Error:		
49	50	51	52	53	54	55	56			
57	58	59	60	61	62	63	64			
Never present Image: Connected Node Occupied Station in Previous Node Image: Connected Node Disconnected Node Image: Connected Node Watch Dog Timer Error Image: Connected Node System Fault Image: Connected Node Previous Error Image: Connected Node										
								Packets: #5000 - 100%	ľ	

Figure 24: Node 50 and Node 52 with System Fault

To dig deeper into this System Fault, we can see the actual frames in Frame Display.

🚱 Frame	Display - cl	lpa-small-file.cfa							
<u>Eile E</u> dit <u>1</u>	View For <u>m</u> at	Filter Bookmarks Options Window	v <u>H</u> elp						
8	7 🔎 🖬	1 😼 🝸 🏹 😂 🌊	🟦 🥃 💷	Filter:	All Frames				
	T 🗱	(C C C C C C C C C C C C C C C C C C C		~ Se		Summary:	CC-Link	 CC-Link with 	Auto-
Unfiltered	Errors C	C-Link							
Bookmark	Frame#	A1	A2	NO. of	Stations	Timestamp	•		^
•	1,985	Master: Polling Data	51			2/16/2011	12:09:09.652997 PM		
•	1,986	Slave: Response of Polling Data	51	1		2/16/2011	12:09:09.653020 PM		
•	1,987	Master: Polling Data	52			2/16/2011	12:09:09.653032 PM		
•	1,988	Slave: Response of Polling Data	52	1		2/16/2011	12:09:09.653054 PM		
•	1,989	Master: Polling Data	53			2/16/2011	12:09:09.653066 PM		
•	1,990	Slave: Response of Polling Data	53	1		2/16/2011	12:09:09.653089 PM		
•	1,991	Master: Polling Data	54			2/16/2011	12:09:09.653100 PM		
•	1,992	Slave: Response of Polling Data	54	1		2/16/2011	12:09:09.653117 PM		
•	1,993	Master: Polling Data	55			2/16/2011	12:09:09.653128 PM		
•	1,994	Slave: Response of Polling Data	55	1		2/16/2011	12:09:09.653145 PM		
									~
- Frame 1,	.988: (CC-Link)	Len=18	A 00110100	11111110	00001000	00100110	10101010 1010101	0 10101010	_
😑 Errors:			N 00101010	10101010	10101010	10101010	10101010 1010101	0 10101010	
□ □ CC-L □ CC-Link:	ink - Paramete	er Receive: Not Received [=0]	Ř 10101010	10101010	01010000	01001100	1		

Figure 25: Node 52 with Parameter Receive Error

Frame 1988 (which is listed in the Error Log) shows that the "Parameter Receive" bit in the ST1 field is set to "Not Received". Therefore, Node 52 is tagged as having a System Fault.



5.1.7 Node with a Previous Error

Sometimes a node can have an error and then recover. If this occurs, the correctly operating node is first displayed in Green. When it has a System Fault, it goes to Yellow state. When the node recovers, it goes to Blue state. Taking the same example of Figure 26, we see the Node 50 is tagged in blue as having a 'Previous Error'.

We can examine Frame Display for more details. The Error Log shows frame 4886 as the last frame where node 50 had a Parameter Error.

🚱 Frame I)isplay - c	lpa-small-file.cfa				
<u>Eile E</u> dit <u>V</u>	iew For <u>m</u> a	it Filter Bookmarks Options <u>W</u> indov	v <u>H</u> elp			
8		🖞 🗣 🏹 😂 🌊	🏦 🕞 💷	Filter:	All Frames	
	m 🛍	. 🕞 🕞 🕤 🖓 Find:		· 🖌	Summary: CC-Link	CC-Link with Auto-
Unfiltered	Errors	CC-Link				
Bookmark	Frame#	A1	A2	NO. of	Stations Timestamp	
•	4,844	Slave: Response of Polling Data	49	1	2/16/2011 12:09:09.834052 PM	
•	4,845	Master: Polling Data	50		2/16/2011 12:09:09.834064 PM	
0	4,846	Slave: Response of Polling Data	50	1	2/16/2011 12:09:09.834087 PM	
•	4,847	Master: Polling Data	51		2/16/2011 12:09:09.834098 PM	
•	4,848	Slave: Response of Polling Data	51	1	2/16/2011 12:09:09.834121 PM	
•	4,849	Master: Polling Data	52		2/16/2011 12:09:09.834133 PM	
•	4,850	Slave: Response of Polling Data	52	1	2/16/2011 12:09:09.834155 PM	
•	4,851	Master: Polling Data	53		2/16/2011 12:09:09.834167 PM	
•	4,852	Slave: Response of Polling Data	53	1	2/16/2011 12:09:09.834189 PM	
•	4,853	Master: Polling Data	54		2/16/2011 12:09:09.834201 PM	<u> </u>
		-				×
Erame 4.8	346: (CC-Link	() Len=18	III 00110010	11111110	00001000 00100110 10101010 10101	010 10101010
E Frors		1201110	N 00101010	10101010	10101010 10101010 10101010 10101	010 10101010
	nk - Parame	ter Beceive: Not Beceived [=0]	R 10101010	10101010	00000011 01110000	.010 10101010
CC-Link:			Ŷ			
- A1: S	lave Station	Response of Polling Data	PA			

Figure 26: Node 50 with Last parameter Error

Following Node 50 in Frame Display, we see that in the next transmission cycle, in Frame 4952, it shows that its Parameter Receive status as "Completed" and it has no other errors in the ST1 field. This is show below in Figure 27.



🥥 Fran	ne Display - cl	pa-small-file.cfa					
<u>File E</u> d	it <u>V</u> iew For <u>m</u> at	Filter Bookmarks Options Window	<u>H</u> elp				
	2 🔎	1 💁 🍸 🍹 😂 🎜 1	h 🥝 💷	Filter: 4	Il Frames		
		🕞 😋 🌍 🌖 🖓 Find:		× 🔎	Summary: C	IC-Link	CC-Link with Auto
Unfilter	ed Errors C	C-Link					
Bookma	ark Frame#	A1	A2	NO. of S	itations Timestamp		<u>~</u>
۰	4,949	Master: Polling Data	49		2/16/2011	12:09:09.840743 PM	
•	4,950	Slave: Response of Polling Data	49	1	2/16/2011	12:09:09.840760 PM	
•	4,951	Master: Polling Data	50		2/16/2011	12:09:09.840772 PM	
	4,952	Slave: Response of Polling Data	50	1	2/16/2011 *	12:09:09.840794 PM	
	4,953	Master: Polling Data	51		2/16/2011	12:09:09.840806 PM	-
	4,304	Slave: Response of Polling Data	51	I	2/16/2011	12:09:09:840828 PM	~
- Fram - CC-L - 4 - 4 - 5 - 5 - 5 - 5 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7	e 4,952 (CC-Link) ind: 1.1: Slave Station: F 22: 50 Slave station inform — W/DT Error: Nol — Reserved bit: 0 — Cyclic Transmis — Switch Change — Parameter Rec — Refresh Receiv — Unit error/Inval — Fuse Status: Nr Slave station inform — Extended Cycli — Reserved bit: 1 — Transmission SI — Transmert Type — Transient Rec — Transient Re	Len=18 Response of Polling Data ation 1 (ST1) 1: Detected sion Flag: Enabled Detection: No Change er: Completed d no. of points: No armal ation 2 (ST2) Setting: Single setting (Ver.1 has no exte latus: Normal .rm ver: Enabled No d Stations: 1 as as as as as	B 00110010 A 0011010 P 10101010 P A 10101010 P A 101010 P A 10 C 2 E U & A A A	1111110 10101010 10101010 26 aa aa a	0000000 00100110 10101010 10101010 11100000 10011111	00101010 10101010 10101010 10101010 аа аа аа аа 60 9f	1010100 10101010
<			> P				
Tabala		es Filtere d'Angli F. 000 France d' Gri d'	ella oco (1 Mil P				
i otal Fra	mes: 5,000 Fram	es Hitered In: 5,000 Frame #s Selecte	3: 4;952; (1 total)				
For Help I	Press F1						

Figure 27: Node 50 recovered from System Fault

5.2 Error Log

As seen in the dashboard screenshots above, the Error log shows a list of all errors along with the Node that caused the error and the frame number in which the error was found. The errors listed in the "Events" column include:

- Watch Dog Timer errors
- Disconnected Error
- Switch Change Detection Error
- Parameter Receive Error
- Refresh Receive Error
- Unit Errors
- Fuse Status Error

A single frame can have multiple errors. In such cases, all the events are concatenated into a single string separated by semi-colons.



6 System Requirements

- PC with Windows XP 32 bit, (Service Pack 2 or higher), Windows 7 (32 and 64 bit).
- Intel Core 2 Duo 2.2 GHz Processor or Higher
- RAM Requirements: 1 GB minimum, 2 GB recommended
- 50 MB free Hard Disk Space (capture file size is limited only by disk size)
- One USB 2.0 High Speed enabled port



7 Technical Support

Technical support is available in several ways. The online help system provides answers to many user related questions. Frontline's website has documentation on common problems, as well as software upgrades and utilities to use with our products.

Web: <u>http://www.fte.com</u>, click **Support**

Email: <u>tech_support@fte.com</u>

If you need to talk to a technical support representative, support is available between 9am and 5pm, U.S. Eastern time, Monday through Friday. Technical support is not available on U.S. national holidays.

Phone: +1 (434) 984-4500

Fax: +1 (434) 984-4505