

IN THE SUPREME COURT OF BRITISH COLUMBIA

Citation: *Equustek Solutions Inc. v. Jack*,
2020 BCSC 793

Date: 20200529
Docket: S112421
Registry: Vancouver

Between:

**Equustek Solutions Inc., Robert Angus,
and Clarma Enterprises Ltd.**

Plaintiffs

And

**Morgan Jack aka Matt Garcia aka Matt Garci aka Ian Taylor,
Andrew Crawford aka Derek Smythe,
Datalink Technology Gateways Inc.,
Datalink 5, Datalink 6, John Doe,
Datalink Technologies Gateways LLC,
Lee Ingraham aka Darren Langdon,
Mike Bunker, Igor Cheifot aka Jolio Fernandez,
Alexander Cheifot aka Randy Schtolz,
Frank Geiger aka Felix Fernandez,
Alfonso Doe, and Colin Marsh and Kathleen Marsh**

Defendants

Before: The Honourable Madam Justice Duncan

Reasons for Judgment

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Place and Dates of Trial:

Vancouver, B.C.
April 3-6, 9-13, 16-20,
23-25, 27, 30, 2018
May 1-4, 7-11, 2018
August 7-10, 20-24, 27-31, 2018
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October 1-2, 2018
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May 6-10, 2019
July 15-17, 2019

Place and Date of Judgment:

Vancouver, B.C.
May 29, 2020

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Introduction

[1] Robert Angus, his design and manufacturing company Equustek Solutions Inc. (“Equustek”), and his holding company Clarma Enterprises Ltd. (“Clarma”) (collectively “the plaintiffs”) have brought this litigation against a number of defendants over the design, manufacture and marketing of a protocol converter.

[2] A protocol converter allows different pieces of industrial machinery to communicate with each other over a network. The network at issue in this case is called DH+, invented and patented in the United States by Allen-Bradley.

[3] A protocol converter is encased in a plastic and metal box, similar in appearance to a cablevision box or a computer modem from the 1990s. The contents of the box include hardware (electronic components such as transformers and diodes), software (source code that tells the electronic components what to do) and firmware (computer chips loaded with software to carry out repetitive but necessary functions).

[4] Mr. Angus maintains that he reverse engineered Allen-Bradley’s DH+ network for implementation in protocol converters manufactured first by his company Equus and then by its *de facto* successor, Equustek. When I refer to Equus in these reasons it is a reference to the company incorporated by Mr. Angus in 1993 which designed and manufactured protocol converters until 2005, when Equustek was incorporated.

[5] In very simple and broadly stated terms, the plaintiffs claim that the defendants conspired to steal confidential material, including DH+ source code, from the plaintiffs’ protocol converter and associated technical documents and used what they stole to create their own DH+ protocol converter, the GW1000, and associated technical documents.

[6] The plaintiffs also allege that the defendants advertised the plaintiffs’ products on their internet websites to draw customers in, then shipped the GW1000 instead and gave customers the impression that the plaintiffs’ products were no longer

available, causing substantial financial damage to the plaintiffs. The wrongful acts underpinning the conspiracy include breach of confidence, passing off, breach of contract, unjust enrichment and breaches of the *Copyright Act*, R.S.C .1985, c. C-42, and the *Trade-Marks Act*, R.S.C. 1985, T-13.

[7] As an alternative to conspiracy, the claim is framed in joint and several liability for discrete torts.

[8] The plaintiffs' claims for damages are framed as: past and future loss of sales; punitive damages; injunctive relief; an accounting and disgorgement of the defendants' profits arising from all sales of products other than Equustek's own products; a declaration that the defendants hold monies in a constructive trust for the plaintiffs, and equitable tracing of these funds; an order piercing the corporate veil and holding all of the defendants jointly and severally liable; special costs, or in the alternative, costs; and interest pursuant to the *Court Order Interest Act*, R.S.B.C. 1996, c. 79.

The Defendants

The participating defendants

[9] Colin Marsh was qualified as an engineer in the U.K. and Canada and had experience in automation at the operational level in factories. He sold Equus protocol converters through his companies - Sage in Canada and Datalink in the United States - pursuant to an oral distribution agreement with Mr. Angus. After litigation in the United States with Allen-Bradley and in British Columbia with Mr. Angus and Equus, Mr. Marsh sold his business to an employee, the defendant Morgan Jack, and moved to France in or around 2004.

[10] Andrew Crawford is an engineer who worked for Mr. Angus between 1993 and 2005, with a short hiatus in 2000-2001 when he worked with Mr. Marsh and Mr. Jack in a venture called Automation Anywhere Inc. ("AAI"), which was closely aligned with Sage. After 2005, Mr. Crawford began working on DH+ products for

Mr. Jack and Datalink on a part-time basis while he worked full-time as a software engineer for an unrelated company.

[11] Lee Ingraham is an engineer who worked briefly as an engineer in training for Mr. Angus at Equus in 1996. Mr. Crawford persuaded him to work on Mr. Jack's projects on a part-time basis in 2005. Mr. Ingraham began working for Datalink in 2007 as a contractor when his previous employer began to have difficulty paying him regularly. His main roles with Datalink comprised of customer support, assembling protocol converters and dealing with parts suppliers.

[12] Mike Bunker is a website designer who provides Search Engine Optimization ("SEO") services. He was acquainted with Mr. Jack, who hired him as a contractor to work on Datalink's internet presence in or around 2005. Mr. Bunker did contract work for Mr. Jack until he was added to the litigation in 2014.

The non-participating defendants

[13] Morgan Jack was, and likely still is, the directing mind behind the Datalink entities named in the style of cause. Mr. Jack's response to civil claim ("RCC") was struck by Dickson J., as she then was, on June 20, 2012, along with the RCC of one of the named Datalink entities, Datalink 4. Mr. Jack apparently decided to abandon his defence and relocate to Mexico. The RCC of another Datalink entity, Datalink 7, was struck by Madam Justice Gropper on March 8, 2013.

[14] Igor Cheifot and his father Alex are both engineers. Both worked on Datalink protocol converters – Igor on software, Alex on hardware. The plaintiffs obtained an Anton Piller Order (the "APO") to search their residences in early 2015. Igor Cheifot's RCC was struck by order of Madam Justice Wedge on September 9, 2015. Wedge J. also found that Alex Cheifot was in default of filing and serving a RCC and ordered that he was not entitled to file one without leave of the Court. The Cheifots appear to have left the jurisdiction in or around the summer of 2015.

An Overview of the Evidence

[15] The trial took place over 73 days between April 3, 2018 and July 17, 2019, substantially exceeding the original 29-day estimate. The plaintiffs tendered thousands of pages of documents and numerous expert reports touching on technical issues, in addition to *viva voce* evidence and extensive read-ins from examination for discovery.

[16] Given the subject matter of this litigation, the use of technical terms was unavoidable. The plaintiffs' expert, Garry Anderson, appended a helpful glossary of terms to his reports. Other terms were used frequently in evidence and their meanings explained by various witnesses. A list of common technical terms is included as Appendix A to these reasons.

[17] The plaintiffs' case on liability turns largely on the inferences to be drawn from documents, primarily emails, many generated by Mr. Jack. The participating defendants all testified and denied having committed any wrongful acts.

[18] A lengthy chronological overview of the evidence will serve to frame the issues arising from the notice of civil claim ("NOCC"). I will refer to evidence of significance as I deal with the issues raised by the pleadings, but I will not refer to all of the evidence or all of the witnesses who testified.

1989: Mr. Angus reverse engineers a protocol converter

[19] Robert Angus is an engineer. He developed an expertise in the field of computerized industrial process controls in the 1970s, as industry began to move away from analog control systems (manually-controlled knobs and valves). In 1989, while he was president of a company called Trionics, Mr. Angus reverse-engineered a protocol converter sold by Allen-Bradley, called the 1770 KF-2 (the "KF-2").

[20] The process of reverse engineering involves examining an item, understanding how it works and often making improvements to it. The parties generally agreed that reverse engineering was ethically permissible.

[21] The KF-2 operated on the DH+ network. Allen-Bradley had expended large sums of money and many years of effort to develop and patent DH+. The network was useful in factories and warehouses, with numerous machines carrying out different functions operating through one protocol converter.

[22] The reverse engineering process took Mr. Angus about two years to complete, working on a part-time basis. He described it as a significant challenge. He called his protocol converter the DFK1000. It was capable of interfacing with Allen-Bradley systems on its closed DH+ network, giving consumers a less expensive alternative to Allen-Bradley devices.

[23] Mr. Angus, through Trionics, incorporated a Washington State company called Data Way Systems Inc. to market the DFK1000. He called the device "Data Link".

[24] Mr. Angus is an engineer, not a salesman. In the late 1980s he began a business relationship with Colin Marsh, who marketed and distributed the DFK1000 in Canada through his company, Sage. Mr. Angus and Mr. Marsh operated under a verbal distribution agreement. Mr. Angus provided his products to Mr. Marsh at a 30% discount so Sage could sell them and make a profit.

1993: Equus is born

[25] In 1993, Mr. Angus left Trionics and incorporated Equus to focus on the DFK1000. He hired Andrew Crawford, a recent engineering graduate. The DFK1000 evolved into the DL2000.

[26] The prefix for Equus's, and later Equustek's, products remained "DL" until around the time that this litigation began and Mr. Angus terminated the distribution agreement with Mr. Jack and Datalink. At that point the "EQ" prefix was adopted to denote Equustek's products. Both Equus and Equustek identified products they designed and manufactured by affixing a small horse head symbol to them.

[27] Lee Ingraham spent a few months working at Equus as an engineer in training around 1995. He did not work on the DL2000 or any DH+ projects. His role was restricted to working on a device called a “smart card” for another company, which hired him after he finished his training.

1998: The Allen-Bradley litigation

[28] The verbal distribution agreement between Mr. Angus and Mr. Marsh worked well until 1998, when Allen-Bradley sued Sage and its American alter ego, Datalink, in U.S. District Court (Eastern District of Wisconsin). Allen-Bradley alleged that Datalink infringed its patented DH+ product by selling Equus’s DH+ products in the United States. Allen-Bradley tried to join Equus in the lawsuit, but was unsuccessful on jurisdictional grounds.

[29] Notwithstanding that Equus was not joined in the litigation, Mr. Angus and Mr. Crawford, along with Mr. Marsh and his lawyer, attended a meeting with Allen-Bradley representatives in September 1999. The purpose of the meeting was for Mr. Angus to demonstrate how the Equus products communicated via the DH+ network and to determine whether, in doing so, any U.S. patents were violated. After the meeting, Mr. Angus changed how Equus products responded to a particular prompt, which I will discuss in further detail in the breach of confidence section of these reasons.

2000: The AAI episode

[30] The relationship between Mr. Angus and Mr. Marsh began to sour around the time of the Allen-Bradley litigation. Then in 2000, Mr. Crawford left Equus to work for Sage and with Mr. Jack in a side venture called AAI, which appears to have operated in tandem with Sage and Mr. Marsh.

[31] Mr. Angus discovered that AAI was marketing “vapourware”, a practice which involves advertising non-existent products on the internet to gauge the potential demand for them. The vapourware in question was the DL4000 and DL5000. Mr. Angus believed those products were being developed with Equus’s trade

secrets, although at the time he had no proof. Mr. Crawford admitted for the first time during his testimony at this trial that he had been provided a copy of Equus's source code to work from at AAI, confirming Mr. Angus's long-held suspicions about what AAI was doing.

[32] In emails written in 2004 to Mr. Angus to clear the air about the AAI episode, Mr. Crawford described Mr. Marsh putting pressure on him at AAI to create a device to sell to Siemens, a company that Equus had done business with. Mr. Crawford denied in the email that he had achieved a working DH+ interface. Mr. Marsh refused to provide non-recoverable engineering (NRE) funding to AAI and Mr. Crawford went into debt to buy parts.

[33] AAI was wound up and Mr. Angus hired Mr. Crawford back to work at Equus in May 2001. AAI's parts inventory, including a batch of signal transformers paid for by Mr. Crawford, was sold to Equus, as was AAI's work in progress, pursuant to an agreement between Mr. Jack, Mr. Crawford, AAI and Mr. Angus dated May 21, 2002.

2001: *Equus v. Sage/Marsh* settles with Allen-Bradley

[34] More or less simultaneously with the AAI episode, Equus sued both Sage for unpaid receivables and Mr. Marsh for a personal guarantee. The claim for receivables was settled in advance of trial. The personal guarantee claim went to trial but was dismissed by Mr. Justice Cullen: 2003 BCSC 315. Subsequently, Cullen J. ordered Equus to pay special costs to Mr. Marsh: 2003 BCSC 1783.

[35] Mr. Marsh settled the lawsuit with Allen-Bradley in 2001 and agreed to cease selling Equus's products in the United States by December 31, 2001. He sold his business (Sage Automation Corporation), which consisted of his customer list, to Morgan Jack (described as President of DataLink Technologies Group, Inc.) for a nominal sum of \$10,000. The purchase price was to be paid at some unspecified time in the future if the company became profitable again. An unsigned agreement for the sale dated July 2, 2001 was in evidence as was an unsigned "understanding" between Mr. Jack and Mr. Marsh dated September 19, 2002. The understanding

provided for a monthly retainer paid to Mr. Marsh for technical services to DataLink Technologies Inc. on an “as available” basis.

[36] Mr. Marsh refused to tell Mr. Angus the terms of his settlement with Allen-Bradley, which did not sit well with Mr. Angus. He believed Mr. Marsh might have received a financial settlement from Allen-Bradley and felt he would be entitled to a share of it. Mr. Angus had paid some of the legal bills arising from the Allen-Bradley litigation (albeit without transparency – Mr. Angus deliberately did not identify them as legal expenses in Equus’s books).

[37] Mr. Angus did not receive the terms of settlement until 2003, as a result of his lawyer applying for disclosure. Mr. Marsh did not gain a monetary advantage from the settlement. To the contrary, there was a \$3.8 million damages assessment against him. Mr. Marsh said he avoided payment by agreeing to keep the settlement secret and getting out of the protocol converter business in the United States.

[38] In 2004, Mr. Marsh moved to France.

2003: Equus evolves into Equustek

[39] The distribution agreement that had operated between Mr. Angus and Mr. Marsh continued between Equus and Mr. Jack’s company Datalink, Sage’s successor. Between the fall of 2003 and early 2004, Mr. Crawford and another Equus engineer, Waleed Warda, with the agreement of Mr. Angus, tried to bring Mr. Jack into the fold at Equus to take charge of sales on an in-house basis. Mr. Jack would not agree to the proposed arrangement. Mr. Angus wanted an agreement on retail pricing so there would be transparency for customers; Mr. Jack preferred being able to set pricing to suit demand. They ultimately agreed on a pricing arrangement, but Datalink remained a separate entity.

[40] The other issue Mr. Angus had with Mr. Jack was the latter’s propensity to drop out of contact for weeks at a time. Mr. Jack had family in New Brunswick and traveled to Mexico fairly frequently and from Mr. Angus’s perspective was not overly attentive to responding to his queries.

[41] In 2004, Equus hired a marketing manager, Bob Huth, and for the first time began to market its own products. Mr. Jack continued to sell Equus products to customers on the Datalink customer list and on the internet under the same terms as the verbal agreement Mr. Angus had with Mr. Marsh. There was a tacit understanding that Mr. Huth would not solicit sales from Datalink's customers.

[42] In 2005, Mr. Angus sold Equus to an acquaintance in the United States before the company paid the special costs judgment that Mr. Marsh had obtained against it in the litigation before Cullen J. Mr. Angus retained Equus's only real asset: the intellectual property behind the DL2000. He then incorporated Equustek to carry on with design and manufacture and Clarma to own the intellectual property.

[43] The DL2000 evolved to adapt to customer demands. Subsequent iterations of the DL2000 included the DL3500 as well as a variety of other models or "flavours", as Mr. Crawford referred to them. Different functions could be achieved by changes to the source code or by adding an external device. The list of products developed and sold by Equustek and, for a time, by Datalink, is in Appendix B to these reasons.

2005: Mr. Crawford leaves Equustek

[44] Mr. Crawford left Equustek for good in early 2005, citing dissatisfaction with his pay and the work he was doing. He maintained that Mr. Angus was an absentee boss who did not carry through on promises to develop new products and make Equustek a public company, which would generate more money for shareholders, including Mr. Crawford.

[45] Mr. Crawford took a job at Tantalus as a software engineer. Mr. Angus was deeply suspicious of Tantalus's motivation for hiring Mr. Crawford. He thought it was a veiled attempt by Tantalus to mine Mr. Crawford for his knowledge of Equustek's DH+ design. Mr. Angus and one of the principals of Tantalus had a somewhat thorny relationship due to dealings in the past, which no doubt amplified the suspicion factor.

[46] Mr. Jack continued to operate a company which sold Equustek products under the distribution agreement with Equustek. Mr. Angus thought it was the same legal entity – Datalink - which had been operated by Mr. Marsh, but as the pleadings illustrate, there came to be several Datalink entities controlled by Mr. Jack.

2005-2006: The QPAB project

[47] In 2005, Mr. Jack persuaded Mr. Crawford to work on a product for Datalink that would reduce or eliminate Datalink’s reliance on Equustek’s products. The product was the QPAB, a DH+ device which Mr. Jack hoped to develop as an in house product for GE.

[48] Mr. Crawford admitted at trial that he began translating the DH+ source code from Assembly language, which Mr. Angus used, into C language, in his final few months at Equustek. C language is the programming language used for the source code in the QPAB and its progeny, the GW1000.

[49] Mr. Crawford worked on the QPAB in his spare time and enlisted Lee Ingraham to assist him. Mr. Ingraham was an electrical engineer. His skills related to the external physical components of the device in development, while Mr. Crawford took care of software issues, including source code.

[50] While the QPAB was under development, Mr. Crawford adopted the alias Derek Smythe and used it in his email correspondence with General Electric (“GE”). Mr. Ingraham adopted the alias Darren Langdon, but he dealt with GE and many parts suppliers in his real name. Mr. Jack used a variety of aliases, including Matt Garcia and Ian Taylor, but not until much later in the evolution of Datalink when litigation was imminent. The Cheifots also used aliases in their later email correspondence.

[51] Mr. Jack was casually acquainted with Mr. Bunker and hired him in 2005 to work on Datalink’s web presence. Mr. Bunker worked on a couple of occasions in or around 2005 at Datalink’s Vancouver office (which was also Mr. Jack’s apartment), answering phones and email and, on one occasion, rearranging the décor so it

would look like a professional workspace when engineers from GE met with Mr. Jack.

[52] For the most part, Mr. Bunker worked remotely from wherever he was living at the time, which ranged from Vancouver to Argentina and then finally Montreal. His work for Datalink was primarily SEO, which involved getting clients' websites to rank at or near the top of the first page of a search engine to boost their internet presence. Mr. Bunker also created websites at Mr. Jack's direction and loaded them with content provided by Mr. Jack.

[53] Igor Cheifot listed his association with Datalink as a software engineer on his resume commencing in 2005. In early 2008, he began to appear in email correspondence between Mr. Jack and others. Igor Cheifot worked with Mr. Crawford at Tantalus from about 2005 until sometime in 2015, when he appears to have left the jurisdiction.

2007: The GW1000 emerges from the ashes of the QPAB project

[54] The QPAB project did not result in Datalink breaking free of reliance on Equustek products, so Mr. Jack asked Mr. Crawford to work on other devices to achieve that goal. Mr. Crawford developed the GW1000, again with the assistance of Mr. Ingraham. They utilized the DH+ work that had been done for the QPAB.

[55] Mr. Crawford and Mr. Ingraham continued in their full-time jobs and worked on the GW1000 in their spare time. The GW1000 was developed under a cloak of secrecy, which Mr. Crawford and Mr. Ingraham said was necessary because Mr. Angus was so suspicious and litigious about anything that might compete with his DH+ products.

[56] Around August 2007, Mr. Ingraham quit his previous employment and began working full-time for Datalink out of his home. He dealt with parts suppliers, assembled protocol converters and provided trouble-shooting services for customers. He also dealt with purchase inquiries which were referred to him by

Mr. Jack or office personnel, including Jennifer Ryane, who operated under the alias of Penelope Jans.

[57] On March 19, 2008, Datalink shipped the first GW1000. The plaintiffs maintain that this coincided with the start of a decline in Equustek's sales. It was also around the time of a worldwide economic downturn.

[58] Datalink used a website which did not appear in internet search engines to launch the GW1000 to its customers, while still appearing to market and sell Equustek's products on searchable websites. Datalink did this by filling an order for an Equustek device with a GW1000, which came with information concerning how to access the non-searchable website.

[59] Mr. Bunker said it was not unusual for him to create websites for customers which were not searchable by internet search engines. Companies would work with the look and functionality of a website before instructing him to take it "live", so that the most professional website would be visible and searchable online, rather than an early prototype.

[60] In September 2008, Mr. Jack emailed Mr. Bunker and asked him to remove mention of some of the functionality of the DL4500 (an Equustek product) from the website, because the GW1000 did not yet perform those same functions. He asked Mr. Bunker to make the changes quickly, because it would cost him money if he had to supply Equustek products to meet demand.

2009: Equustek gets wind of the GW1000

[61] In early 2009, Equustek's marketing manager, Mr. Huth, was alerted to the possibility that Datalink was passing off its products as Equustek products. Mr. Huth received two DH+ GW1000 products from a customer who had purchased them from Datalink, apparently expecting to receive Equustek protocol converters. Mr. Angus and Mr. Huth determined that the units did not work.

[62] The GW1000s came with a letter dated November 1, 2008, which said:

Dear DataLink User

Thank you for purchasing a DataLink Communication Controller. Please find enclosed our latest DataLink Gateway 1000 platform.

This next generation controller is a replacement to the DL3500 & DL4500 platform. Enhancements include a simple internet configuration, palm-size portability, DH+ speeds of 230 Kb, Serial and USB communication.

[63] The letter referred to an enclosed CD with application notes and a user manual and a reference to a website: www.datalink-gateways.com. It was identical to the known Datalink website www.datalinkgateways.com, apart from the hyphen, and not discoverable through an internet search. It was the website that Mr. Bunker had created at the request of Mr. Jack.

[64] It appears that Mr. Jack exhibited some creativity in trying to make Datalink's GW1000 line-up of products look bigger than it was. He directed Mr. Bunker to change website product listings from EQ7000 (an Equustek product) to DL7000 (Datalink vapourware, such a device never existed). This caused Mr. Ingraham, who was working in customer support, some difficulty. A customer emailed him in August 2009 asking for a device capable of a specific application and referring to integrating the DL4500 into an existing Allen-Bradley DH+ system. Mr. Ingraham emailed Mr. Jack and said he wanted to reply to the customer but was worried about "flubbing up our model numbers". They were recommending a DL7000 to him but shipping a GW1000 DHP. He asked if Mr. Jack had "a DL7000ized version of the GW1000 ABE quickstart".

[65] In October 2010, Mr. Huth and Mr. Angus ordered a DL3500 from Datalink via a company that belonged to a friend of Mr. Angus, in order to conceal their identities. The GW1000 they received in December worked well enough that they considered it to be functional.

[66] In October 2010, Mr. Crawford emailed Mr. Ingraham and Igor Cheifot about "the problem on long lines", a reference to the GW1000's unreliability over longer transmission distances. Mr. Crawford invited Igor Cheifot to have a conversation with his father Alex Cheifot about the issue as any help was welcome.

2011: The demand letters

[67] On January 18, 2011, the plaintiffs wrote a demand letter to Mr. Jack, which he forwarded to Mr. Crawford, Mr. Ingraham and Igor Cheifot. Igor Cheifot was at that time working on an Ethernet protocol for Datalink. The demand letter severed the verbal distribution agreement between Equustek and Datalink.

[68] The plaintiffs subsequently sent a letter to Mr. Crawford, informing him that Equustek believed that Datalink had commissioned him to produce a complete replacement line of products using Equustek's trade secrets.

[69] On or about January 24, 2011, Datalink's previously unindexed website went "live". Mr. Jack emailed Mr. Crawford, Mr. Ingraham, Mr. Cheifot and another individual to announce the first "transparent" quote for Datalink.

[70] That same day Mr. Ingraham emailed Mr. Jack, requesting that he pull a document off the Datalink website with "LEE05.RSS" in the title bar, although he observed, "[i]t's probably too late." It is a fair inference that Mr. Ingraham did not want his real first name appearing on documents on the searchable Datalink website, knowing that Mr. Angus had retained a lawyer and issued a demand letter to Datalink.

[71] On February 16, 2011, Mr. Ingraham sent an email from a Shaw account in his own name to Alex Cheifot with a technical question. He said, "[f]or some legal reasons that Igor may have mentioned to you, I go by the name of Darren with all my Datalink communications. I'll see [sic] you an email from there, and we can communicate that way."

[72] In March 2011, Mr. Angus wrote to the Association of Professional Engineers and Geoscientists of British Columbia ("APEGBC") to inquire if Datalink, which was holding itself out as an engineering firm, had any engineers on staff. Mr. Jack received a letter from the APEGBC inquiring about engineers on staff and shared it by email with Mr. Crawford and Mr. Ingraham.

[73] Mr. Crawford remarked in his response to Mr. Jack concerning the APEGBC letter that it was “obviously Angus” behind the complaint and, “[n]o worries, Datalink Canada is no more”. Mr. Jack was in the process of moving Datalink to Mexico. Mr. Ingraham assisted him in these efforts.

[74] Mr. Ingraham observed to Mr. Jack and Mr. Crawford that the APEGBC query was Mr. Angus’s effort to draw “Derek” out into the open, but that he was Datalink’s staff engineer, although he did not want his involvement with Datalink to be a matter of public record.

April 2011: The litigation begins

[75] The plaintiffs did not receive any substantive responses to their demand letters and filed a NOCC in April 2011 against Morgan Jack, Andrew Crawford, Datalink Technology Gateways Inc., Datalink 5, Datalink 6, and John Doe. Datalink Technologies Gateways LLC was added as a defendant by order of Master McDiarmid on October 19, 2011.

[76] In October 2011, Igor Cheifot began using the alias Jolio Fernandez and requested that Mr. Ingraham and Mr. Jack use his new email address in that name to communicate with him. Mr. Jack said he did not want Igor Cheifot’s name on any correspondence but wanted him to check his Datalink email account frequently.

[77] Mr. Jack began consulting with Colin Marsh in this timeframe as well. Emails located as a result of the APO reflect Mr. Marsh warning Mr. Jack against DH+ products, as they would provoke the ire of Mr. Angus.

[78] Alex Cheifot appeared in email threads concerning GW1000 technical issues after the litigation began. On January 31, 2012, Igor Cheifot, from his Jolio Fernandez email, wrote to Mr. Jack and Mr. Ingraham announcing “New email created! Please welcome...Randy Shtolz!!!” Igor Cheifot wrote in the body of the email:

Hi Guys

I have created the email for the....,well you know who was missing one i hope :) So now you can email him directly with all the questions regarding the daughter-board and any other hardcore shit that i have no idea about.

His email is:

randy.shtolz@gmail.com

Cheers

Jolio, the mexican!

[79] Mr. Ingraham emailed Alex Cheifot on February 15, 2012 about a “loopback” test between two GW1000s. He reported that error-free loopback was limited to a distance of only 4,054 feet. Further emails about loopbacks between GW1000s and DL3500s were sent by Mr. Ingraham. In 2013, Alex Cheifot advised Mr. Marsh, Mr. Jack and Igor Cheifot by email that he had substantially improved the GW1000’s transmission range.

[80] Mr. Ingraham’s last day of work for Datalink was April 30, 2012.

The pre-trial applications

[81] The plaintiffs pursued dozens of pre-trial applications in an effort to obtain documents from the defendants and to ascertain the identities of those who worked on the GW1000 project.

[82] The defences of Mr. Jack and the Datalink defendants were struck on June 20, 2012.

[83] Subsequent iterations of the NOCC added more defendants as well their aliases:

Morgan Jack a.k.a. Matt Garcia, a.k.a. Matt Garci, a.k.a. Ian Taylor

Andrew Crawford a.k.a. Derek Smythe

Lee Ingraham a.k.a. Darren Langdon

Igor Cheifot a.k.a. Jolio Fernandez

Alexander Cheifot a.k.a. Randy Shtolz

Colin Marsh a.k.a. k.c. firth

[84] In addition, Igor Cheifot set up emails for himself, his father, Mr. Jack and Mr. Marsh on “adelab.org” where they communicated about the litigation and other matters. Those emails came to light as a result of the APO search. “Adelab.org” was Igor Cheifot’s private domain name, not known to anyone except invitees and a couple of component suppliers based in China. Igor Cheifot assured Mr. Marsh that if he accessed his Adelab webmail through its webmail portal, he would have a secure connection between the server and his computer would be encrypted.

[85] Igor Cheifot’s assurances about the security of Adelab appear to have persuaded Mr. Marsh to use his Adelab address, but he still asked Igor Cheifot to delete past, present and future communications, because he promised his wife he would do so. Mr. Marsh said he wanted to keep a clean slate that Mr. Angus could not penetrate because of their history.

[86] On June 13, 2014, Fenlon J., as she then was, ordered that Google Inc. cease indexing or referencing in search results on its internet search engines a list of websites associated with Datalink (the “Google order”). Subsequent orders of the court expanded the list of websites. The Google order was appealed. The Supreme Court of Canada upheld it: *Google Inc. v. Equustek Solutions Inc.*, 2017 SCC 34.

[87] The GW1000 continued to be marketed on different internet websites, flouting the Google order and continuing the income flow for Datalink.

[88] In March 2015, the plaintiffs obtained an APO against Igor and Alex Cheifot. The order authorized the search of the Cheifots’ residence and revealed numerous hard drives and hundreds of emails with the other defendants and Colin Marsh, usually by the alias k.c. firth, in conversations about the GW1000 and the litigation.

The APO search also revealed that the Cheifots had Equustek source code on their computers.

[89] The Cheifots appear to have left the jurisdiction some time after the APO was executed and as noted earlier, Igor Cheifot's response to civil claim was struck and Alex Cheifot was prohibited from filing a defence without leave of the court.

[90] For reasons that are unclear, the plaintiffs did not take default judgment with damages to be assessed against Mr. Jack, the Datalink companies or the Cheifots.

[91] Before the plaintiffs' forensic computer expert, Colin Cree, could access the complete contents of the computers belonging to the Cheifots which had been seized in the APO search, the passwords were remotely changed and access was not possible. It is an irresistible inference that it was the Cheifots, to whom those hard drives belonged, who engineered the password change in order to avoid discovery of any incriminating documents.

[92] Mr. Marsh was added as a defendant in January 2017 on the basis of the APO correspondence where he communicated with Mr. Jack and others about the progress of the litigation. His wife, Kathleen, was also added as a defendant, but on the second day of trial the plaintiffs discontinued proceedings against her and another defendant, Frank Geiger.

The positions of the participating defendants

Andrew Crawford

[93] Mr. Crawford denies that he stole trade secrets from the plaintiffs or breached any confidences flowing from his employment by Mr. Angus or his companies. He states that he did not have any knowledge of any trade secrets from his time working with Mr. Angus, and, in any case, did not use any to design and build the GW1000.

[94] Mr. Crawford denies any responsibility for the business decisions of any of the Datalink companies, or for the sales or shipping of the products at Datalink. He specifically denies involvement in shipping any GW1000 products in place of any

Equustek products, and denies representing to anyone that the GW1000 is an upgrade or consolidation of Equustek products.

[95] Mr. Crawford denies altering or copying any of Equustek's manuals or infringing the plaintiffs' copyright in any way. He states that his work for Mr. Jack consisted of providing technical support for software issues and adding serial and Ethernet protocols via software to the DH+ option board, using his skills, training and expertise. He denies agreeing to breach any duty of confidence, using any trade secrets to develop the GW1000 products, or diverting Equustek's business or goodwill to anyone.

Lee Ingraham

[96] Mr. Ingraham says that during the period of his work for Equus in 1996, he worked on a project completely unrelated to the trade secrets and confidential information at issue in this litigation. Further, Mr. Ingraham submits that he did not work for any of the plaintiffs in this action, and therefore cannot owe any of the alleged duties to them. Mr. Ingraham was contracted by Datalink solely to perform electronics design on hardware for the QPAB and GW1000, and was not involved with the software development, source code or website development.

[97] Mr. Ingraham states that the claims against him are an abuse of process, as the plaintiffs know the particulars of his involvement in the development of the products, that he could not be in possession of any information constituting a trade secret or confidential information, and that he could not owe any duties to the plaintiffs. He alleges that the action brought was for a collateral and improper purpose, as an attempt to force him to produce documents at his own expense.

Mike Bunker

[98] Mr. Bunker says that he has no relationship with any of the defendants except Mr. Jack. He worked for Mr. Jack as an independent contractor to provide SEO and web design services. Once a domain name was obtained, Mr. Bunker turned it over to Mr. Jack, who controlled it as the host. Mr. Bunker states that he never had any

knowledge about the plaintiffs' trade secrets, copyrights or trademarks, nor any knowledge about the business affairs of the other defendants.

[99] Mr. Bunker maintains that he played no role in Mr. Jack's online sales campaigns and had no agreement or venture with Mr. Jack or the other defendants. Mr. Bunker denies that he ought to have known of any misuse of trade secrets. He understood that Mr. Jack had an agreement to resell Equustek products as well as other products that were competitive with Equustek.

Colin Marsh

[100] Mr. Marsh maintains he was only tangentially involved in communicating with Mr. Jack and the Cheifots between 2012 and 2014, after the main events underpinning the plaintiffs' allegations arose and after the litigation had commenced. He asserts that he was afraid of Mr. Angus, due to past litigation, and wanted to avoid him entirely. He says his involvement is captured in a few emails commencing in 2012 in which he provided advice to Mr. Jack on how to avoid conflict with Mr. Angus in the litigation, including his advice that Mr. Jack get out of the DH+ business entirely.

[101] Mr. Marsh had no contact with Mr. Ingraham between 1996 and the commencement of this trial in 2018. He had no contact with Mr. Crawford after 2003 until the trial commenced. He has never met Mr. Bunker and did not correspond with him in any capacity. Mr. Marsh also points out that none of those defendants said he was involved. He denies any business interest in any of Mr. Jack's companies.

[102] Mr. Marsh acknowledges that he used an alias, destroyed emails, and asked Mr. Jack and the Cheifots to destroy their emails with him. He says that those emails came to light after the APO search and do not support any of the plaintiffs' assertions against him, nor do they demonstrate he was part of any concerted action.

The non-participating defendants

[103] The plaintiffs maintain that since Mr. Jack, the Datalink defendants and the Cheifots have no responses to civil claim they are deemed to have admitted the allegations against them.

[104] The participating defendants do not agree that this is the effect of striking out defences under the *Supreme Court Civil Rules*, B.C. Reg. 168/2009, and assert that the status of the non-participating defendants does not assist the plaintiffs with proof of their case against the participating defendants, particularly in relation to the conspiracy pleading.

[105] In *Equustek Solutions Inc. v. Jack*, 2012 BCSC 1490, the plaintiffs applied a second time for a *Mareva* injunction, the first having been refused by Leask J. Punnett J. granted the injunction, in no small part because the balance of convenience had shifted in favour of the plaintiffs after the RCC of Mr. Jack and the Datalink defendants was struck. Punnett J. observed:

[36] The effect of the striking of the statement of defence of the Datalink Defendants is that it is deemed to be an admission of the allegations contained in the plaintiffs' notice of civil claim. In *Mclsaac v. Healthy Body Services Inc.*, 2009 BCSC 1716, Mr. Justice Pearlman reviewed the law on deemed admissions arising from a judgment taken in default of defence. He concluded that the authorities established certain principles to be applied as to the effect of such deemed admissions. At para. 44 he stated:

[44] I take the following principles from these cases:

- a) Generally, if a statement of defence is struck, the defendant is deemed to have admitted the allegations of fact contained in the statement of claim. Where the defence is struck with damages to be assessed, all that remains in issue is the assessment of damages.
- b) The rule that the defendant is deemed to have admitted all of the allegations of fact in the statement of claim is not immutable. The plaintiff must prove his or her claim for damages. The court retains the discretion, which it must exercise judicially, to permit the defendant to adduce evidence and cross-examine on issues essential to a fair and just determination of the loss actually sustained by the plaintiff.

...

[37] The order striking their defence did not find the Datalink Defendants “liable with damages to be assessed.” Therefore, while the facts respecting liability are deemed to be admitted, the court can still exercise its discretion. The facts in the statement of claim are not “immutable.” [emphasis added]

[106] This is not a case where defences were struck but the defendants nonetheless participated in the trial. As a result, the facts respecting liability in the NOCC are deemed to be admitted against Mr. Jack, the Datalink defendants and the Cheifots, unless otherwise stated.

Credibility and reliability

[107] The credibility of the defendants is a central issue in this case. They were cross-examined extensively on their thought processes and actions in relation to documents, primarily email correspondence. The plaintiffs maintain the defendants’ exculpatory explanations for their actions were not credible.

[108] I will set out my assessment of the credibility of the parties who testified. There were several expert and non-expert witnesses whose evidence was important in some respects, and I will deal with my assessment of their credibility where their evidence was necessary to resolve an issue.

[109] Credibility and reliability are two separate, but related, considerations. In *R. v. H.C.*, 2009 ONCA 56, Watt J.A. described the difference between the two (at para. 41):

Credibility and reliability are different. Credibility has to do with a witness's veracity, reliability with the accuracy of the witness's testimony. Accuracy engages consideration of the witness's ability to accurately

- (i) observe;
- (ii) recall; and
- (iii) recount

events in issue. Any witness whose evidence on an issue is not credible cannot give reliable evidence on the same point. Credibility, on the other hand, is not a proxy for reliability: a credible witness may give unreliable evidence: *R. v. Morrissey* (R.J.) (1995), 80 O.A.C. 161; 22 O.R. (3d) 514 (C.A.), at 526 [O.R.].

[110] Dillon J. in *Bradshaw v. Stenner*, 2010 BCSC 1398 said:

[186] Credibility involves an assessment of the trustworthiness of a witness' testimony based upon the veracity or sincerity of a witness and the accuracy of the evidence that the witness provides (*Raymond v. Bosanquet (Township)* (1919), 59 S.C.R. 452, 50 D.L.R. 560 (S.C.C.)). The art of assessment involves examination of various factors such as the ability and opportunity to observe events, the firmness of his memory, the ability to resist the influence of interest to modify his recollection, whether the witness' evidence harmonizes with independent evidence that has been accepted, whether the witness changes his testimony during direct and cross-examination, whether the witness' testimony seems unreasonable, impossible, or unlikely, whether a witness has a motive to lie, and the demeanour of a witness generally (*Wallace v. Davis*, [1926] 31 O.W.N. 202 (Ont.H.C.); *Farnya v. Chorny*, [1952] 2 D.L.R. 152 (B.C.C.A.) [*Farnya*]; *R. v. S.(R.D.)*, [1997] 3 S.C.R. 484 at para.128 (S.C.C.)). Ultimately, the validity of the evidence depends on whether the evidence is consistent with the probabilities affecting the case as a whole and shown to be in existence at the time (*Farnya* at para. 356).

Robert Angus

[111] Mr. Angus gave evidence concerning the evolution of process control technology, the reverse engineering process he undertook to develop the DFK1000, his business relationship with Mr. Marsh and his employment relationship with Mr. Crawford and Mr. Ingraham.

[112] Some of the defendants attacked Mr. Angus's character and credibility in a collateral manner, by painting him as a bully, a bad boss, an absentee boss, a vindictive former boss, a breaker of promises and a mean drunk. Overall, the defendants referred to him as a litigious individual with little to do but harass them and spin conspiracy theories. Mr. Angus admitted to overseeing the creation of a website excoriating many of the defendants in this case before the trial began, the content and tone of which lends some credence to the defendants' collateral attacks.

[113] It is fair to say that this litigation has consumed Mr. Angus. Equustek has done no product innovation in a number of years because his attention has been focussed on getting to the bottom of what he believes is a multi-year effort to covertly steal the intellectual property behind his protocol converters and subvert his business through unfair marketing tactics.

[114] Substantively, counsel for Mr. Ingraham challenged Mr. Angus about evidence he gave in an affidavit about Equustek's market share of the industrial

protocol converter market on a worldwide basis. Mr. Angus's estimate of 35% seemed improbably high, given that Equustek is a much smaller industry force than Allen-Bradley and others, but the affidavit actually refers to industrial network interface devices, which counsel for the plaintiffs suggests is actually a smaller subset of the market.

[115] While there was very little evidence about the size of the industrial interface device market, I am satisfied that Mr. Angus was attempting to be accurate and was not claiming a share of a much larger market.

[116] Counsel for Mr. Crawford cross-examined Mr. Angus extensively on technical matters in an effort to demonstrate that his definition of source code was erroneously broader than Mr. Crawford's definition. This was necessary to demonstrate that Mr. Crawford's use of some of Equustek's source code was either trivial or that it was in the public domain. Mr. Angus did not agree with this recharacterization of the scope of source code or that any of Equustek's source code was in the public domain.

[117] I found that none of the collateral negative attacks or substantive cross-examination points affected Mr. Angus's evidence on important points, in particular, his belief in what constitutes source code and whether elements of it were in the public domain. I am satisfied he was truthful in his evidence. As for reliability, Mr. Angus did not remember with painstaking detail events that happened a long time ago, nor did he strain credulity by attempting to fill in gaps to his advantage, although he did let his tendency to see conspiracies around every corner cloud his view of history.

Andrew Crawford

[118] Mr. Crawford's evidence was replete with significant frailties that affected both credibility and reliability, including:

- Agreeing that he answered interrogatories as vaguely but correctly as he could, because he did not want to name any of the other participants;

- Ignoring court orders for the production of documents until the point where the plaintiffs applied to have his defence struck, after which the plaintiffs discovered by sheer happenstance that he had an additional trove of relevant emails with the other defendants which he had not listed;
- Telling Igor Cheifot in an email on March 11, 2011 that in 2001, when he was working at AAI, that he had “done it from his head”, then admitting at trial that he was given Equustek source code to use at AAI and as a result knowingly used the plaintiffs’ trade secrets as far back as 2000 and had not, in fact, done work at AAI from his head;
- Misrepresenting his identity by adopting the alias Derek Smythe and using it professionally with representatives of GE and with others;
- Despite being a professional engineer he failed to retain any notebooks or work product concerning the development of the QPAB or the GW1000 to substantiate his claims that he came up with design on his own and without reference to any trade secrets or confidential information gleaned from the plaintiffs;
- Providing different explanations at different points in the litigation on a variety of core issues concerning his design of the GW1000.

[119] Collectively, I find that Mr. Crawford’s explanations and rationalizations are simply not credible and cast his defence of independent design into serious doubt.

Lee Ingraham

[120] Some of Mr. Ingraham’s conduct was questionable. He struggled to explain why he used an alias. He vacillated between “it was fun” (which is hard to accept, given that he is a mature individual with a professional designation, not a teenaged gamer living in his parents’ basement) and “for legal reasons”. It was clear that he perceived Mr. Angus as a litigious individual, so his “for legal reasons” rationale is

likely the more accurate reason for the use of an alias. I infer he tried to distance himself from the use of an alias because he realized in retrospect that it looked bad.

[121] Mr. Ingraham helped Mr. Jack move Datalink's operations to Mexico and trained his replacement, despite the fact that he was aware litigation had begun. Mr. Ingraham explained that Mr. Jack's desire to move somewhere warmer was no surprise to him and given that Datalink seemed to be having financial difficulties, he was prepared to move on to work at something else. Mr. Ingraham also maintained that the GW1000 was an original product which did not infringe on Mr. Angus's products and thus Datalink was not in the wrong, nor was his assistance in facilitating the move.

[122] Mr. Ingraham did not name Igor Cheifot in the early stages of the litigation. The plaintiffs cross-examined him about an email they sent to him inquiring who else was involved with the GW1000. Mr. Ingraham did not respond by naming Igor Cheifot, despite the fact that he was frequently in email threads involving Mr. Ingraham and others, and obviously not an outsider to Datalink's operations. Mr. Ingraham maintained that the plaintiffs' request was vague.

[123] Mr. Ingraham's reticence to name Igor Cheifot is very close to the line of acceptable responses in the litigation process, but it finds a parallel in how he gave his evidence at trial. Mr. Ingraham strained to avoid answering questions which he perceived as vague or broad. One could infer he was trying to avoid implicating himself, but in most instances it was apparent he was trying to be as precise as possible, although occasionally to the point of absurdity.

[124] For example, Mr. Ingraham was cross-examined as an adverse witness during the plaintiffs' case on the question of how much it cost to build a GW1000 and whether or not the parts costs on the bill of materials, which he authored, were in Canadian or American dollars. Mr. Ingraham declined to commit himself to a definitive answer on the currency issue but explained this was because of the amount of time that had passed and the fact that different suppliers quoted in different currencies. The cross-examination on what should have been a relatively

simple point was far lengthier than it needed to be, but I am satisfied it was caused by Mr. Ingraham's desire for precision rather than by his reticence to answer questions.

[125] Overall, I conclude that Mr. Ingraham was a credible witness.

Mike Bunker

[126] There was very little in the evidence that affected Mr. Bunker's credibility. I acknowledge he was copied on many internal Datalink emails by Mr. Jack and he undertook to create websites which were not indexed on Google and thus were nearly impossible to find. By doing so, Mr. Bunker's computer skills assisted with the secretive early marketing of the GW1000. Mr. Bunker explained, however, that it was not uncommon for companies to create websites for customers which were not widely available as a sort of "soft launch" of a product or service. In his line of work, unindexed websites were not a hallmark of illegal activity.

[127] I accept that Mr. Bunker did not understand what the GW1000 did, because he was not an engineer. He had no knowledge about what Equustek did, what they produced, or Mr. Jack's relationship with Equustek and its products, except that he was a reseller. Once the litigation began, I accept that he took Mr. Jack's word that the lawsuit was without foundation.

[128] Mr. Bunker was clearly naïve, in hindsight, to trust Mr. Jack and not make further inquiries about what he was being asked to do, but I am satisfied he gave credible and reliable evidence concerning his lack of knowledge about what Mr. Jack and Datalink were doing in relation to Equustek and its products.

Colin Marsh

[129] Mr. Marsh has some bitter litigation history with Mr. Angus through the *Equus v. Sage* litigation. He gave advice to Mr. Jack about how to respond to the present litigation and he was clearly aware of what was going on during pre-trial applications, but he denied any wrongdoing or conspiratorial acts.

[130] Mr. Marsh asked Mr. Jack and the Cheifots to destroy their correspondence with him in or about 2014, several years before he was joined as a defendant. The plaintiffs maintain this means that Mr. Marsh's evidence must be viewed with care.

[131] I am satisfied that Mr. Marsh gave credible evidence. While at first blush his request that the Cheifots destroy emails indicating his involvement in discussions with them appears to demonstrate a cavalier regard for the litigation process, Mr. Marsh was not at the time involved as a party to this litigation. He was motivated by a realistic fear of another round of litigation with Mr. Angus and not, I am satisfied, because he was intent on covering up unlawful activity. In any event, the emails obtained as a result of the APO do not undermine Mr. Marsh's evidence.

Organization of the issues

[132] Counsel for the plaintiffs divided their submissions into chapters, each related to a specific aspect of the pleadings. I have structured these reasons in that fashion, with the exception that I have left conspiracy to be addressed after I deal with the liability of individual defendants for the other alleged torts.

[133] In addition, there are issues raised in the plaintiffs' pleadings which will be addressed after these reasons are released, such as the continuation of the Google order.

Use of trade secrets and breach of the duty of confidence

[134] The plaintiffs have included both use of trade secrets and breach of the duty of confidence in their pleadings, but focused on the latter, maintaining it is broader and incorporates the use of trade secrets.

[135] Kelleher J. provided a helpful summary of the law of breach of confidence in *XY, Inc. v. International Newtech Development Incorporated*, 2012 BCSC 319 [*XY, Inc.*, SC]; appeal allowed only in relation to injunctive relief and unjust enrichment, 2013 BCCA 352 [*XY, Inc.*, CA]:

[202] The general principle underlying breach of confidence is that where a person obtains information in confidence, the person may not use the

information for activities detrimental to the person who makes the communication: *Terrapin Ltd. v. Builders' Supply Co. (Hayes) Ltd.* (1959), [1960] 5 R.P.C. 128 (C.A.). It is an equitable cause of action, rather than a tortious one: *Economic Interests in Canadian Tort Law* (Peter T. Burns and Joost Blom (Markham: LexisNexis, 2009)) ("Economic Interests") at 213. The wrong is comprised of three elements: (a) the information conveyed was confidential; (b) it was communicated in confidence; and (c) it was misused by the party to whom it was communicated: *Coco v. A.N. Clark (Engineers) Ltd.*, [1969] R.P.C. 41 at 47 (U.K. ChD.), cited by La Forest J. in *Lac Minerals Ltd. v. International Corona Resources Ltd.*, [1989] 2 S.C.R. 574 at 635-36.

[203] Material can remain confidential even though it is available to the public. "[W]hat makes it confidential is the fact that the maker of the document has used his brain and thus produced a result which can only be produced by somebody who goes through the same process": *Saltman Engineering Co. Ltd. v. Campbell Engineering Co. Ltd.* (1948), 65 R.P.C. 203 (U.K.C.A.) at 215, quoted with approval by Sopinka J., dissenting in part, in *Lac Minerals Ltd.* at 610.

[136] The plaintiffs say that Mr. Jack, the Datalink defendants and the Cheifots have admitted breach of confidence by default; Mr. Crawford is liable; Mr. Ingraham is liable by reason of actual or constructive knowledge of Mr. Crawford's breach; Mr. Bunker is liable if he is found to be part of the alleged conspiracy; and Mr. Marsh is liable by reason of actual or constructive knowledge of Mr. Crawford's breach or as part of a conspiracy.

Breach of confidence - Andrew Crawford

The plaintiffs' theory

[137] The plaintiffs contend that when Mr. Crawford left Equustek in 2005 he almost immediately began work on a DH+ product at the behest of his friend, Mr. Jack, who was still Equustek's distributor through his company Datalink. The plaintiffs maintain that the work was done to resolve, in Datalink's favour, the "core tension" that had existed since Equustek and Datalink began the distributorship arrangement: Equustek controlled the supply of the products and Datalink controlled the sales. If Datalink had its own product line, it could break free of Equustek's supply line.

[138] The plaintiffs' theory is that this project was a continuation, or revival, of similar efforts in the past, most notably the AAI episode, after which Mr. Angus rehired Mr. Crawford. Mr. Angus was not aware until Mr. Crawford's evidence at trial

that he had been working on a protocol converter at AAI using Equus's source code and board schematics.

[139] The plaintiffs maintain that Mr. Crawford used elements of Equustek's protocol converter, some of which were confidential (such as source code) and others which may not have been confidential *per se*, but their use reflected the fact that Mr. Crawford did not put any original thought into the design of either the QPAB or the GW1000, choosing instead to follow Mr. Angus's well-trod path with which he was familiar by virtue of his employment at Equustek. In doing so, the plaintiffs say Mr. Crawford breached his duty of confidence to his former employer.

Mr. Crawford's response

[140] Mr. Crawford denies plotting to usurp Mr. Angus's product line by using Equustek intellectual property. He maintains that he left Equus to work with Mr. Jack at AAI because his work at Equus was not what he expected and he wanted to work on different products. He realized that Mr. Marsh or Mr. Jack were using him to implement Equus source code on AAI products and he returned to Equus, partly because Mr. Angus promised they would work on new products. This did not come to pass and by 2004, Mr. Angus was an absentee boss and Mr. Crawford was bored, underpaid and underutilized.

[141] Mr. Crawford left Equustek to work at Tantalus on products completely unrelated to DH+. He agreed to work in his spare time on the QPAB for a challenge and on the promise that Mr. Jack would somehow "look after him", although the basis for his remuneration was never clear. It appears that at most Mr. Crawford benefited from his work on the QPAB and the GW1000 in the amount of about \$60,000 consisting of some payments, the use of a leased vehicle and a family trip to Disneyland paid for by Mr. Jack.

[142] Mr. Crawford maintains that he worked to ensure both the QPAB and the GW1000 were different from the DL3500. He used a different CPU and wrote his source code from scratch using C language. He used his knowledge, gained at Equustek, of how the DH+ protocol worked to write the source code for the DH+

commands, noting that DH+ is not proprietary to Equustek, but rather to Allen-Bradley.

[143] Mr. Crawford also took advantage of a number of off-the-shelf solutions (integrated design environments) to streamline his development time, which were not available to Mr. Angus in the late 1980s when he reverse engineered DH+ from the Allen-Bradley product. Mr. Crawford asserts that anything he used that also appeared in an Equustek device was publicly available and/or of a trivial nature and not confidential information or a trade secret.

The plaintiffs' technology experts

[144] The plaintiffs commissioned expert opinions about technological issues from two witnesses: Dr. Peter Boetzkes and Garry Anderson.

Dr. Boetzkes

[145] Dr. Boetzkes was not originally required for cross-examination purposes at trial; however, Mr. Crawford retained counsel, Ms. Stickland, shortly before trial, and she applied for leave to cross-examine Dr. Boetzkes. The plaintiffs were opposed, but I allowed Ms. Stickland a limited time for cross-examination.

[146] Dr. Boetzkes was qualified as an expert in the design and development of micro processor controlled electronics, including network communications of those products and their related communications protocols, and the design and development of both source code and hardware development for micro processor electronics, a.k.a. embedded systems. He was asked to compare the DH+ and DF1 diagnostic codes from the Equustek code, the Ingraham code and the Cheifot code with each other and with the published equivalents from Allen-Bradley. He calculated the probabilities that the same terms would be used in Equustek code and in the Cheifot and Ingraham code, notwithstanding his assumption that some of the Equustek code had never been published.

[147] Ms. Stickland's cross-examination of Dr. Boetzkes focussed on challenging the application of probabilistic statistical methods to predict the likelihood of

similarities between Equustek source code and elements of the Cheifot and Ingraham code. In concluding Mr. Crawford's defence, however, the focus was on the assertion that the similarities had either been published, and therefore were not trade secrets, or, in the alternative, they were so insignificant that their usage did not constitute tortious conduct.

Garry Anderson

[148] The other expert for the plaintiffs was Garry Anderson. He is an electrical engineer and was qualified in the same area of expertise as Dr. Boetzkes. His role was to compare elements of the Equustek protocol converter with known elements of the GW1000, and more specifically to analyze the claims Mr. Crawford had made at examination for discovery concerning his claims of independent design of the GW1000. Mr. Anderson generated a number of reports.

[149] Counsel for Mr. Ingraham took significant objection to Mr. Anderson's reports on several grounds, including bias. While I dismissed the application to exclude the Anderson reports, I was cognizant of the concerns expressed by Mr. Ingraham's counsel about Mr. Anderson's negative assessment of Mr. Crawford's competence in engineering. I listened to Mr. Anderson's evidence with a view to determining whether or not he was biased against Mr. Crawford.

[150] I concluded Mr. Anderson was not biased, a conclusion which was fortified by fair concessions he made on cross-examination. In particular, Mr. Anderson said that if he had been instructed by Mr. Fleming, counsel for the plaintiffs, that Mr. Crawford had worked on DH+ devices and source code for over a dozen years, his opinion might well be different. Overall, Mr. Anderson's reports provided invaluable assistance to understanding what goes on inside a protocol converter, but his negative conclusions on Mr. Crawford's engineering capabilities could not and did not decide the case because of the plaintiffs' unduly circumscribed instructions to him.

The evidence underlying the plaintiffs' claims against Mr. Crawford

[151] The plaintiffs rely on four categories of evidence to support their allegations that Mr. Crawford breached a confidence owed to Mr. Angus in the development of the QPAB and GW1000. Those are (1) "fingerprints" (hardware and software); (2) use of Equustek source code; (3) lack of independent design; and (4) dishonest conduct.

1. "Fingerprints"

[152] "Fingerprints" is the term used by the plaintiffs to describe hardware and software features identified in the GW1000 which also exist in the Equustek protocol converter. The term caused some confusion for the defendants, because while the plaintiffs pleaded theft of trade secrets, not all of the fingerprints are trade secrets. The plaintiffs maintain the fingerprints are like a trail of breadcrumbs from the Equustek product to the Datalink products. Mr. Crawford has never disclosed design notes or source code for the GW1000 or its predecessor the QPAB to illustrate his route to success in duplicating the function of the Equustek protocol converter,

a. The hardware fingerprints

i. The design of the DH+ interface

[153] Mr. Angus testified that the DH+ interface was by far the most complicated aspect of the work involved in reverse engineering the DH+ network and the most complex engineering challenge of his life. While he was vice president at Trionics he identified the Allen-Bradley device as something that would be useful as a platform for a peer-to-peer network involving multiple nodes, such as a parking lot or a building with more than one entry and exit point. Technology prior to that, designed as a master and slave system, was not advanced enough to recognize more than one active node on a network at one time.

[154] Mr. Angus purchased some Allen-Bradley devices and began the process of reverse engineering the DH+ network. This involved listening to activity on the network with an oscilloscope and determining how to get a message on and off the

closed network within the timing parameters established by the Allen-Bradley device. Mr. Angus testified that he listened to the network, built a list of what he “saw” on the network, deciphered the commands and then attempted to send data back and forth.

[155] Mr. Angus wrote those commands himself as source code. The DH+ system was closed and the commands were not published. Once he wrote the commands he had learned, he figured out the structure of them and then the sequences for how to get on to the network. Sometimes a bit of guesswork was used, which involved sending a command to get invited on to the network then attempting to pass a “token” around.

[156] As a very elementary analogy, the development process was akin to a scenario where someone who has never played hockey, let alone seen a sheet of ice or a pair of skates, must decipher the game first from a radio broadcast with every second word deleted, before moving to the arena to experience the game while blindfolded, then gradually proceeding to a seat on the players’ bench, to removing the blindfold to see the ice, then taking to the ice and then finally passing and receiving the puck and making shots, while periodically having to sit in the penalty box for failing to abide by the unwritten rules of the game.

[157] After about two years of working on the DH+ interface, Mr. Angus got to the point where he had a working design that emulated much of the Allen-Bradley closed network. He realized it was more than a solution to the problem he set out to solve – how to deal with a parking lot or a building with multiple entries which would not work with a master-slave network - it was a business opportunity in and of itself. It could be used outside Allen-Bradley’s products to communicate between various types of revenue control devices, as one example, or to integrate other devices onto a network and broaden the expanse of Allen-Bradley’s DH+ network by connecting foreign equipment to it through one device, rather than multiple pieces of wire connecting to multiple different inputs.

[158] Mr. Angus's idea was to take his device and connect it with the Allen-Bradley network. Eventually he succeeded. He left Trionics and began Equus to continue to work on the standalone replacement for Allen-Bradley DH+ protocol converters.

[159] Mr. Crawford's explanation of how he overcame the mystery of the DH+ interface, without resorting to Mr. Angus's source code, was on its surface similar to the process Mr. Angus explained. He said he listened to the network and followed other reverse engineering processes that he had learned from Mr. Angus during his years at Equustek. He denied using Equustek source code itself, but only used what was "in his head" from years working for the company. He also said he used a "sniffer", a device which detects activity on a network. The sniffer in question was the Equustek "capture command", which had been written by Mr. Angus for Equustek's own use. Mr. Crawford also used the Equustek diagnostic (or DIAG) program.

[160] Mr. Crawford did not produce any log books or development notes to show his process of developing the DH+ interface that came to be used in the QPAB and the GW1000. As I understand his evidence, he either did not keep log notes or if he did, he gave them to Mr. Jack when he ultimately left the Datalink project.

[161] Mr. Crawford delayed producing a list of documents until Mr. Jack had abandoned the litigation. Then he explained the lack of documents by saying he had given them to Mr. Jack, who was of course no longer available, or that his computer crashed or that he no longer had access to Datalink servers, despite the fact that he sat beside Igor Cheifot at work. Igor Cheifot was by then in control of Datalink's source code repositories. A few short pieces of Datalink source code were produced, but never a full version, and there was no expert evidence to substantiate Mr. Crawford's position that he had designed his DH+ source code independently.

[162] Mr. Crawford insisted that Mr. Jack wanted him to design the QPAB so there could be no complaints that it was not independently developed, but Mr. Angus testified that the DH+ interface developed by Mr. Crawford was identical to the DH+ interface Equustek used.

[163] Mr. Crawford admitted at trial that during the AAI interlude in 2001, he used the plaintiffs' board schematics and source code to work on products for AAI, although he was interested in working on things other than DH+. This was a clear indication that in eight years of working exclusively on DH+ at Equus, Mr. Crawford was not capable of independently deciphering it and writing his own source code while at AAI.

[164] Mr. Crawford also asserted that he did not use Equustek source code because he wrote in C, and Equustek source code was in Assembly. But he also said he began the task of converting Equustek source code into C language in the months before he departed Equustek.

ii. The GL34A diode

[165] The GL34A diode is nothing special and its presence on the Equustek printed circuit board ("PCB") was temporary. It filled an awkwardly shaped spot on the PCB and was eventually replaced when the PCB was reconfigured and a less expensive diode with the same properties replaced it. The GL34A diode is not a trade secret and its presence on the PCB can be detected with the naked eye or at most a magnifying glass.

[166] From the outset of the litigation, the plaintiffs have maintained that the presence of the GL34A diode in the GW1000 is another instance of Mr. Crawford using something that Equustek employed in one iteration of its product as a shortcut, because he did not understand what the diode did and could not replace it with something that made more spatial and economic sense.

[167] On cross-examination, Mr. Crawford was confronted with a statement in an affidavit filed early in the litigation that he had no knowledge of the use of the GL34A diode or its electrical characteristics. He acknowledged that he was not a diode expert but he had used it before and thought it would do the same job as another diode. Essentially, it's the one that popped into his head to use.

[168] The other conclusion, which the plaintiffs urge, is that Mr. Crawford used the GL34A because he simply copied chunks of Mr. Angus's schematic designs.

iii. The Transformer

[169] Much time was spent during the course of trial on the issue of whether or not the Datalink transformer was a direct copy of the Equustek transformer. The plaintiffs' own expert, Mr. Anderson, remarked that the simplest thing for Mr. Crawford to do was to send the transformer to a manufacturer and have them reverse engineer it for him. But Mr. Crawford did not admit he had done so and his explanations about the origin of the transformer he used varied, depending on when he was asked for a response.

[170] At various junctures in the litigation, Mr. Crawford claimed that the Datalink transformer did not look at all like the Equustek one, or that he had reverse engineered the KF2 transformer to create the Datalink one and that he had provided the specifications for manufacture, or that it was the transformer created for AAI, and finally, that he did not know anything about the transformer at all.

[171] It is apparent from email correspondence that nobody at Datalink had the specifications on hand for the transformer that went into Datalink products. Various manufacturers asked for it, in order to give a quote for manufacture, but none materialized. At one point, Mr. Ingraham took an Equustek transformer apart to count the windings inside it, but this still did not assist.

[172] Finally, right around the time litigation commenced, Datalink began making efforts to source an entirely new transformer. An inference could be drawn that this was a late-breaking effort to make the GW1000 and its derivatives look different than the Equustek products.

[173] If Mr. Crawford had done the sensible thing and simply asked a manufacturer to reverse engineer the Equustek transformer, Equustek would not have any reason to complain about the GW1000 on the basis that it had the same transformer. Instead, Mr. Crawford obfuscated the issue and gave various explanations for the

apparently identical transformer. His efforts in so doing tend to demonstrate that he was trying to cover up the fact that he copied large elements of the Equustek product and this eroded his credibility.

iv. The Manchester encoder/decoder

[174] Manchester Phase Encoding is a form of PLD or Programmable Logic Device. The PLD design in the Datalink products is the same design used in Equustek products.

[175] Mr. Warda testified that he and Mr. Crawford worked on the design together in 2004, utilizing an article by a company called Xilinx. Notwithstanding that it was a technical article, at that time there was no website associated with Xilinx.

[176] Mr. Crawford acknowledged in his evidence at trial that he worked with Mr. Warda at Equustek and used the Xilinx article, but said he had forgotten about that when he was struggling with the QPAB PLD in the fall of 2006. He said he found the article and solved the QPAB PLD problem from it, without using any of the work from Equustek.

[177] On examination for discovery, Mr. Crawford had claimed that the PLD was something he had designed to be different from Equustek's; however, in emails written to GE engineers in the fall of 2006, he referred to having written a couple of PLDs in the past and said he was looking at adding one to the QPAB in a Xilinx PLD device in front of the processor. The only PLDs he had written before the QPAB were ones at Equustek using Xilinx, so his claim that he designed the PLD for the QPAB to be different from Equustek's rings hollow. In addition, he admitted on examination for discovery that the PLD design for Equustek's devices was a confidential technique he learned from his time at Equustek.

[178] Mr. Crawford encountered further issues with the PLD in January 2007. He told Mr. Ingraham that he had two old personal computers with the PLD design on them in old Lattice software and said somehow they would have to get at the information. Equustek used Lattice software on its Manchester encoder/decoder and

Mr. Crawford had worked from home while employed by Equustek. Then two weeks later, Crawford emailed Ingraham to say he thought he had found a PLD design and “half did it myself”. It is an irresistible inference that the other half of the problem was solved because of the work he had done at Equustek.

[179] Finally, after the plaintiffs issued the demand letter in early 2011, the defendants appeared to be on the hunt for a new PLD design. It could be inferred that Mr. Crawford was trying to make changes to distance the GW1000 platform from the Equustek product.

b. The software fingerprints

i. 9128 Hex

[180] 9128 Hex is an address in the Equustek source code which was randomly assigned by the compiler during the build process. It was related to the diagnostic status command.

[181] To understand the 9128 Hex issue, imagine source code as a very densely populated neighbourhood containing many houses with invisible addresses, in no logical order and no published map. 9128 Hex was one of the houses in the Equustek neighbourhood.

[182] Mr. Crawford acknowledged that he hard-programmed 9128 Hex into the Datalink source code, instead of allowing the compiler he was using to randomly assign an address for the diagnostic status command during the build process. He said that he did so because he “sniffed” the communications on a DL2000 and obtained the address. He did not think the address was important, nor did he think it was important to change the address to be different than Equustek.

[183] Mr. Crawford said he thought 9128 Hex was a hard-coded address, so he hard-coded what he saw “on other devices”. However, in Allen-Bradley products, the address corresponding to the diagnostic status command was E144 Hex. The only other device in evidence with 9128 Hex was the Equustek product.

[184] Mr. Anderson, the plaintiffs' expert, was unable to determine any logical explanation for Mr. Crawford hard-coding 9128 Hex into the GW1000. He said that if Mr. Crawford had copied Equustek source code, the 9128 Hex address would not appear because Crawford was using a different chip and a different processor and the code would randomly assign an address during the compiling process.

[185] If Mr. Crawford had written his own code for the GW1000, the test results would again show some random address other than 9128 Hex, because of the random nature of the compiling process.

[186] This is an area where I rely on Mr. Anderson's opinion, because it was not premised on Mr. Crawford's competence as an engineer but on the function of a compiler and specifically, the random nature of the compiling process which would not result in 9128 Hex occurring again randomly in someone else's source code.

ii. E100

[187] E100 is another address issue, somewhat similar to the 9128 Hex, except E100 is an Allen-Bradley KF2 memory address which is not documented anywhere. It relates to the Active Node Table. Mr. Angus found the Active Node Table in the KF2 and figured out how to access it from E100 Hex. He hard-coded it into Equustek's products to get the correct behaviour from the DL3500.

[188] E100 exists in Datalink products. Mr. Crawford did not specifically say how he determined the address. The plaintiffs maintain that he simply copied it from the Equustek product.

iii. Active node table

[189] Allen-Bradley's KF2 issued a "read active node table" command that checked how many devices were online at any point in time, like a roll call at school. This was a patented function which Mr. Angus copied onto Equus devices. After the patent litigation commenced, Mr. Angus and Mr. Crawford attended a meeting with Allen-Bradley to discuss how the Equus devices worked. One of the outcomes of this

meeting was that Mr. Angus agreed to change the “read active node table” command.

[190] The Allen-Bradley patent, including the “read active node table” command, expired in 2005, after Mr. Crawford had left Equustek. Mr. Angus then changed the design in Equustek products back to the former “read active node table command” he had earlier copied from Allen-Bradley.

[191] The GW1000 used the design Mr. Angus changed as a result of the patent litigation. Bluntly put, Mr. Crawford appears to have used Mr. Angus’s patent-compliant work around.

**iv. DH+ variables (commands) of NAKK and
ILLEGAL_HIGHWAY_STATUS**

[192] In his source code, Mr. Angus left two areas blank to ensure that there would be room for additional source code in the event that it was necessary to accommodate a future development. He named them NAKK and ILLEGAL_HIGHWAY_STATUS. He made up the names himself and had never encountered them anywhere else. Mr. Angus said that because they are in source code, they are not in the public domain. He referred to them as variables, but Mr. Crawford and his counsel referred to them as labels or declaration code and maintained they were not actually part of source code.

[193] Dr. Peter Boetzkes was asked by the plaintiffs to compare various aspects of DH+ and DF1 diagnostic functions of Equustek products with source code obtained via document discovery from Mr. Ingraham. Mr. Ingraham said he received the source code as an attachment to an email from Mr. Crawford. It came to be referred to as the Ingraham code. Dr. Boetzkes also examined source code obtained from the APO search of the Cheifots’ computers, which was not surprisingly referred to as Cheifot source code.

[194] Dr. Boetzkes was asked if the commands NAKK and ILLEGAL_HWY_STATUS exist in the Ingraham source code and if so, were they copied from the Equustek source code. He said:

The commands “NAKK and “ILLEGAL_HWY_STATUS do exist in the Ingraham source code, as referenced in section 3.1 above. Clearly the entire command list is sufficiently similar to that in the Equustek source code to indicate the strong probability of copying. However, I could not have high confidence in such a conclusion if all of the commands in the list were in common use in the field of data communications and associated software. In this set of commands, however, the plaintiffs assert that the last two commands, “NAKK” and “ILLEGAL_HWY_STATUS”, were originated by them and are not commonly used in the industry. They further assert that these commands are not even used within the Equustek code, apart from their initial definition. I have done a phrase search on both terms, and have found no relevant references. The term “NAKK” does not appear to have any common usage in data communications software, unlike such terms as “ACK” and “NAK”. A search on the word “NAKK” generates mainly references to the name or initials of a person or character, company or product. Similarly, the subsequent label “ILLEGAL_HWY_STATUS” appears to have no common usage in data communications software, and does not bring up any references in a phrase search. The use of the acronym “NAKK”, followed immediately by the term “ILLEGAL_HWY_STATUS”, therefore makes it reasonable to conclude that the Ingraham command labels are derived from, or copied from, the Equustek source code. This conclusion depends on the plaintiff’s assertion that these terms were originated by them in the context of the confidential source code and associated documentation for the Equustek product, and that these were not published or used elsewhere by them.

[195] Mr. Crawford said at trial that he recalled NAKK and ILLEGAL_HWY_STATUS from the Equustek source code and put them in his source code. At his examination for discovery, however, he said that he could not recall if NAKK or the ILLEGAL_HWY_STATUS commands were in the Equustek source code while he was there.

v. DH+ diagnostic counters

[196] Dr. Boetzkes, in his report, defined the word “label” as a name assigned to a location in computer memory that holds a block of information, usually a number. Because they are used frequently in source code, labels are usually single words, so the programmer does not have to type a long sentence to get the source code to carry out its function.

[197] “Descriptor”, on the other hand, is a plain language description of the meaning of the memory-location contents referred to by the label. A descriptor is normally written into source code as a comment by the programmer after the initial definition of the label. The descriptor is of no use to the computer, but can assist the programmer. Descriptors are often longer phrases rather than single words.

[198] Dr. Boetzkes set out the Allen-Bradley DH+ diagnostic counter descriptors in his report:

Allen-Bradley DH+ Diagnostic Counters (descriptors only) (from page 9-11, Reference Manual - Publication 1770-6.5.16 — October 1996)

Times received ACK with bad CRC.
Times timeout expired with no ACK received.
Transmit re-tries exhausted.
NAK/illegal protocol operation received.
NAK/bad LSAP received.
NAK/no memory received.
Received ACK/NAK too short.
Received ACK/NAK too long
Something other than an ACK/NAK received.
Token pass timeouts.
Token pass re-tries exhausted.
Claim token sequence entered.
Tokens claimed.
Bad CRCs in received frame.
NAK/illegal protocol operations sent.
NAK/bad LSAPs sent.
NAK/no memory sent.
Received frame too small.
Received frame too long.
Received a re-transmission of a frame.
Received frame aborted (line noise).
Messages successfully sent (**low byte first**)
Messages successfully received (**low byte first**).
Commands successfully sent (**low byte first**).
Replies successfully received (**low byte first**).
Commands successfully received (**low byte first**)
Replies successfully sent (**low byte first**).
Replies could not be sent.
Active nodes.

The highlighted items above are those words, or parts of words, within the descriptors that were omitted or modified by Equustek in generating their corresponding list of descriptors.

[199] And then the Equustek diagnostic counters, both labels (in capitals) and descriptors:

_CRC_BAD Received ACK with bad CRC
 TIM_NO_ACK Timeout expired with no ACK received
 RET_TX Transmit re-tries exhausted
 NAK_ILLEGAL NAK/illegal I protocol operation received
 NAK_BAD NAK/bad LSAP received
 NAK_MEMORY NAK/no memory received
 RX_SHORT Received ACK/NAK too short
 RX_LONG Received ACK/NAK too long
 RX_OTHER Something other than ACK/NAK received
 TIM_TOKEN Token pass timeout
 RET_TOKEN Token pass re-tries exhausted
 SEQ_TOKEN Claim token sequence entered
 CLM_TOKEN Token Claimed
 CRC_BAD Bad CRC5 in received frame
 NAK_TX_ILLEGAL NAK/illegal protocol operation sent
 NAK_TX_BAD NAK/bad LSAP **send**
 NAK_TX_MEMORY NAK/no memory sent
 RX_FR_SHORT Received frame too small
 RX_FR_LONG Received frame too long
 RX_RET_FRAME Received a re-transmission of a frame
 RX_FR_ABORT Received frame aborted (line noise)
 MSGTX_OK Message successfully sent
 MSG_RX_OK Message successfully received
 CMDTX_OK Command successfully sent
 REPRX_OK Reply successfully received
 CMDRX_OK Command successfully received
 REPTX_OK Reply successfully sent
 REPTX_NOK Reply could not be sent
 NO_NODES **Number of** active nodes

The highlighted items above are those words added by Equustek to the corresponding descriptors in the published list from Allen-Bradley.

[200] And finally the diagnostic counters, both labels (in capitals) and descriptors, from the Inghram code:

ucACK_CRC_BAD Received ACK with bad CRC
 ucTIMEOUT_NO_ACK Timeout **expores** with no ACK received
ucRETRY_TX_EXHAUSTED Transmit re-tries exhausted
 ucNAK_ILLEGAL NAK/illegal **protcol** operation received
 ucNAK_BAD NAK/bad LSAP received
 ucNAK_MEMORY NAK/no memory received
 ucRX_SHORT Received ACK/NAK too short
 ucRX_LONG Received ACK/NAK too long
 ucRX_OTHER Something other than ACK/NAK received
 ucTIMEOUT_TOKEN Token pass timeout

ucRETRY TOKEN Token re-tries exhausted
ucSEQUENCE TOKEN Claim token **sequence** entered
ucCLAIM_TOKEN Token claimed **successfully**
ucFRAME_BAD_CRC Frame has a bad crc
ucNAK_TX_ILLEGAL NAK/illegal protocol operation sent
ucNAK_TX_BAD NAK/bad LSAP **sent**
ucNAK_TX_MEMORY NAK/no memory sent
ucRX FRAME SHORT Received frame **to short**
ucRX_FRAME_LONG Received frame **to long**
ucRX_FRAME_RETRANS Received **frame** re-transmission
ucRX FRAME ABORT Received frame aborted
usMSG_TRANSMIT_OK Message successfully **transmitted**
usMSG_RECEIVED_OK Message successfully received
usCMD_TRANSMIT_OK Command successfully **transmitted**
usREPLY_RECEIVED_OK Reply successfully received
usCMD_RECEIVED_OK Command successfully received
usREPLY_TRANSMIT_OK Reply successfully **transmitted**
usNO_REPLY_TRANSMIT No reply transmitted
ucNUMBER_DHP_NODES Number of active nodes **on Network**

The highlighted labels above are those that are different from the corresponding Equustek labels in some way other than the expansion of abbreviations. The addition of the prefix “uc” or “us” used throughout this list is not included as a difference for comparing with the Equustek labels.

The highlighted words in the descriptors above are those that differ from the corresponding words in the Equustek descriptors, even if those differences are only spelling errors.

[201] Dr. Boetzkes considered the probabilities that the Ingraham code was copied from the Equustek code. He noted that since Allen-Bradley did not publish its labels, the Ingraham labels could not be derived from them. He also noted that there were some differences between the Ingraham labels and the Equustek labels.

[202] Taking into consideration the differences, such as expanding a word like “sequence” instead of using “seq” and using prefixes like “us” and “uc”, and issues such as word order, Dr. Boetzkes calculated that it was at least 99.9727% probable that the selection of labels in the Ingraham code was not random or independent, strongly indicating they were derived from the earlier Equustek code.

[203] While Ms. Stickland, counsel for Mr. Crawford, cross-examined Dr. Boetzkes on his calculations, the defence submissions concerning the startling similarities was simple: Mr. Crawford adapted his labels and other elements of code from

Equustek's, but since they were either in the public domain or trivial, it did not matter and did not constitute a breach of confidence.

vi. DF1 diagnostic counters

[204] Mr. Angus and Mr. Warda testified that Equustek's DF1 diagnostic counters were not published or displayed in any way by Equustek. Mr. Crawford testified that they were published, although he had not produced any documents prior to trial in this regard. He was given the opportunity after concluding his evidence to produce documents to support his claim of publication, but he did not do so. I accept the evidence of Mr. Angus and Mr. Warda on this point.

[205] Dr. Boetzkes was asked by the plaintiffs to compare the labels and descriptors defined for the GW1000 DF1 diagnostic counters in the Cheifot code with the labels and descriptors defined for the same counters in the Equustek source code, assuming for the purposes of the opinion that the Equustek ones were not published.

[206] After editing the Cheifot code to remove star and slash punctuation marks associated with C code comments, as well as punctuation associated with Assembly code comments, Dr. Boetzkes derived the following lists for comparison purposes:

Labels and descriptors defined for the DF1 diagnostic counters in the Equustek source code.

NO_TX Number of attempted messages
NO_TX_ACK Messages successfully tx'd and ACKeU
ACK_RX_OK Number of ACKs received
ACK PASSED ACKs passed from separator to transmitter
NAK_RX Number of NAKs received
NAK_PASSED NAKs passed from separator to transmitter
TIM_WAIT Number of timeouts waiting for a response
ENQ_TX Number of ENQs sent
MSGTX_NOK Messages that could not be sent
REPTX_DES Reply messages that were destroyed
MSG_RX Number of messages received
ACK_TX Number of ACK5 sent
NAK_IX Number of NAK5 sent
ENQ_RX Number of ENQs received
RET_RX_ACK Number of retransmissions received and ACKed
STX_RX Number of STX(full duplex) or SOH(half duplex)

MSG_IGNORED Messages, or fragments that were ignored
 MSG_ABORT Messages aborted by receipt of DLE ENQ
 MSG_UNKNOWN Messages aborted by other than DLE ENQ
 NO_BUF DLE ACK sent but no buffer space
 NO_BUF2 DLE NAK sent because no buffer available
 RX_BROADCAST Number of broadcast messages received
 RX_BR_OK Broadcast messages successfully received
 MSG_OTHER Messages that were not for this station
 EOT_TX Number of OLE EOTs sent
 CALL_RXD Number of calls received
 HUNG_UP Number of times that phone was hung up
 DCD_LOST Number of times that DCD was lost
 DCD_HUNG_UP Phone hang ups because of DCD timeout

The highlighted item in the Diagnostic Counter Labels above is the one omitted from the equivalent label in the Cheifot code.

[207] And the Cheifot code:

Labels and descriptors defined for the DF1 diagnostic counters in the Cheifot Code.

NO_TX Number of attempted messages
 NO_TXwACK Messages successfully tx'd and ACKed
 ACK_RX Number of ACKs received
 ACK_PASSED ACKs passed from separator to transmitter
 NAK_RX Number of NAKs received
 NAK_PASSED NAKs passed from separator to transmitter
 TIMEOUT_WAIT Number of timeouts waiting for a response
 ENQ_TX Number of ENQs sent
 MSGTX_NOK Messages that could not be sent
 REPTX_DES Reply messages that were destroyed
 MSG_RX Number of messages received
 ACK_TX Number of ACK5 sent
 NAK_TX Number of NAKs sent
 ENQ_RX Number of ENQs received
 RET_RX_ACK Number of retransmissions received and ACKeU
 STX_RX Number of STX(full duplex) or SOH(half duplex)
 MSG_IGNORED Messages, or fragments that were ignored
 MSG_ABORT Messages aborted by receipt of DLE ENQ
 MSG_UNKNOWN Messages aborted by other than DLE ENQ
 NO_BUF_TXACK DLE ACK sent but no buffer space
 NO_BUF_TXNAK DLE NAK sent because no buffer available
 RX_BROADCAST Number of broadcast messages received
 RX_BR_OK Broadcast messages successfully received
 MSG_OTHER Messages that were not for this station
 EOT_TX Number of DLE EOTs sent
 CALL_RXD Number of calls received
 HUNG_UP Number of times that phone was hung up
 DCD_LOST Number of times that DCD was lost

DCD_HUNG_UP Phone hang ups because of DCD timeout

The highlighted items in the Diagnostic Counter Labels above are those omitted or changed from the equivalent labels in the Equustek source code.

[208] And the Allen-Bradley code:

Descriptors defined for the DF1 diagnostic counters in the Allen-Bradley document (from page 9-10, Reference Manual - Publication 1770-6.5.16 — October 1996)

Times the node attempted to send a message.

Messages were successfully **transmitted** and ACKed.

ACKs received.

ACK5 **successfully** passed from the receiver's separator to the transmitter.

NAKs received.

NAKs passed from **the** separator to **the** transmitter.

Timeouts waiting for a response.

ENQs sent.

Messages that could not be **successfully** sent.

Reply messages that **could not be forwarded** and were destroyed.

Messages received.

ACKs sent.

NAKs sent.

ENQ5 received.

Re-transmissions received and ACKeU.

A re-transmission is a message that has a transparent word, command, and source that match the previous message.

STX (full-duplex **mode**) or SOH (half-duplex **mode**) **received**.

This is a count of the number of messages that were started.

Messages, **characters**, or **message** fragments that were ignored.

Messages aborted by receipt of a DLE ENQ.

Messages aborted by **the receipt of an unexpected control code** other than

OLE ENQ.

Times the DLE ACK response was sent but there was no buffer space for the next message.

DLE NAK was sent because **there was** no buffer.

Broadcast messages received.

Broadcast messages **that were** successfully received.

Messages that were not for this node.

OLE EOTs sent.

Calls received.

Times the phone was hung up **by the module**.

DCD was lost.

Times the phone was hung up because of a DCD timeout.

The highlighted words above are those that were changed or omitted in both the Equustek source code and Cheifot code.

[209] Dr. Boetzkes noted that the DF1 diagnostic counter labels, 29 in total, appear in both the Equustek and Cheifot code, but do not appear in published Allen-Bradley documentation. The Cheifot labels are nearly identical to the Equustek ones. There are five commands that are slightly different as between Equustek and Cheifot:

NO_TX_ACK v. NO_TXwACK
ACK_RX_OK v. ACK_RX
TIM_WAIT v. TIMEOUT_WAIT
TXACK v. TXNAK in commands 20 and 21

[210] In Dr. Boetzkes' opinion, the only plausible way of having two nearly identical lists of command labels in the Cheifot code, apart from copying the Equustek code, would be to derive them from the Allen-Bradley descriptors. Allen-Bradley published the descriptors, but without a related list of labels. The average probability of any given label in the Cheifot code being completely identical to the corresponding label in the Equustek code was calculated at 33.3%. The probability that any combination of 24 of the 29 labels would be identical was 0.00000612%. To put it another way, the probability that the Cheifot labels were derived from the Equustek labels is 99.99999388%.

2. The use of Equustek source code

[211] The plaintiffs maintain that Mr. Crawford had access to Equustek source code and used it during the QPAB build. On the issue of access to source code, the plaintiffs note the following:

- Mr. Crawford had access to all of Equustek's confidential information, including source code, board schematics and other related information, during his employment there;
- when Mr. Crawford left Equustek to work for AAI, he was provided with Equustek source code by Mr. Jack or Mr. Marsh;
- there was no evidence about what happened to that version of source code once AAI folded;

- Mr. Crawford admitted to copying Equustek's DF1 and DH+ diagnostic counters from a document he had at home after he left Equustek, although that appears to be contradicted in an email to his mother in 2011 in which he told her they did not print out source code at Equustek;
- the DH+ variables include the NAKK and ILLEGAL_HIGHWAY_STATUS variables that appear unique to Equustek;
- Mr. Crawford used his home computers to work on the QPAB, the same computers he used when working for Equustek from home;
- the evidence that Mr. Crawford deleted Equustek source code from those computers was equivocal at best;
- Mr. Warda saw back-up discs prepared by Mr. Crawford with Equustek source code on them when the latter was preparing to exit the company in 2005; and
- Mr. Crawford sat next to Igor Cheifot at Tantalus and Equustek source code was discovered as a result of the APO search of the Cheifots' home.

[212] In addition, while working on the DH+ prototype for the QPAB, Mr. Crawford encountered difficulties with the PLD design. As noted earlier in these reasons, he resorted to using the Xilinx equations and the Lattice software he had on his old computers.

[213] In January 2007, Mr. Crawford emailed to Mr. Ingraham a partial source code package, the one that came to be termed the Ingraham source code (also referred to as NetOS-gnu). It contained a file path for four modules of Equustek source code, the same file path as was in the backup disk Mr. Crawford created when he left Equustek in February 2005, according to Mr. Warda.

[214] The plaintiffs assert it is an irresistible inference that Mr. Crawford took his backup disk home and retained a copy of it in order to enable himself to create a

complete implementation of DH+. The four modules on the disk also contained the DH+ and DF1 labels which the plaintiffs rely on as fingerprints, discussed above.

[215] Ultimately, Mr. Crawford maintained that the DH+ and DF1 labels were not even source code. He relied on a difference between declaration code (or labels) and implementation code (source code that tells the computer how to execute), maintaining that they were two totally separate parts of how the code worked. The plaintiffs were permitted to recall Mr. Angus to deal with this point. His evidence was unequivocally to the contrary: labels or declaration code are part of source code.

3. Lack of independent design

[216] The plaintiffs say that Mr. Crawford produced no evidence that he developed the Datalink products separately, including design notes or source code, and that he has given false and inconsistent testimony about the development process. I have already touched on this subject under the heading concerning the DH+ interface and the lack of notes or design materials produced in this litigation, but the plaintiffs point to some specific evidentiary gaps and contradictions to fortify their point.

a) Failure to disclose documents

[217] Mr. Crawford never provided a log book, design notes or source code during the document discovery phase of the litigation. He was slow in producing documents, necessitating several pre-trial applications, including one to strike out his response to civil claim. He claimed his computer died. He said he no longer had access to Datalink source code while still working with Igor Cheifot, who had taken over from him as Datalink's software engineer, and while still in communication with Mr. Jack. At the same time, emails in Mr. Crawford's possession dated between the fall of 2011 and April 2012 illustrated that he had access to Datalink source code, because he was creating "bin files".

[218] Mr. Crawford's failure to retain proof of independent design is unusual. He is a professional engineer and was purportedly afraid of Mr. Angus, given his litigious nature, yet he embarked on working in an area that was near and dear to

Mr. Angus's heart without retaining proof that he was as skilled as his master in deciphering DH+ and creating his own DH+ source code without reference to Equustek source code.

b) Deciphering DH+

[219] As noted earlier in these reasons, Mr. Angus referred to deciphering DH+ as the most difficult engineering task he had ever undertaken. Mr. Crawford's explanation was to the effect that he used some tools, such as a "sniffer", and got the job done in his spare time.

[220] The "sniffer" was in fact the Equustek "capture command". Mr. Crawford also used the Equustek DIAG program. Mr. Crawford had experience using both of them while employed at Equustek. He maintained that they were publicly available. Mr. Angus said they were provided to customers of Equustek in some circumstances to assist with troubleshooting.

[221] Mr. Crawford said he wrote in C language, the implication being that Equustek's Assembly language source code would not have been useful to him, but the Datalink source code was never disclosed in the litigation and the plaintiffs are unable to ascertain if it was written in C, as Mr. Crawford claimed.

[222] I pause to observe that nobody suggested translating Equustek source code from Assembly to C language would be a simple matter, but Mr. Crawford said he had begun that task before leaving Equustek. Apart from that, having source code for the DH+ in Assembly language would give Mr. Crawford a head start to writing a C language source code. He could understand Assembly because he had worked in it for his entire career before leaving Equustek.

c) Expert evidence

[223] Mr. Anderson, the plaintiffs' expert, was of the opinion that Mr. Crawford's explanation of reverse engineering the DH+ was not sufficiently detailed; however, Mr. Anderson candidly acknowledged on cross-examination that he had not been advised by the plaintiffs that Mr. Crawford had worked on DH+ for over 10 years.

Mr. Anderson's opinion therefore about the insufficiency of Mr. Crawford's ability to decipher DH+ will be given no weight.

d) Mr. Crawford's limited abilities generally

[224] The plaintiffs point out that while at AAI, Mr. Crawford resorted to using Equustek's board schematics and source code. If he had been able to decipher and implement DH+ without Equustek's materials, AAI would undoubtedly have been a more successful venture.

[225] The plaintiffs maintain that between Mr. Crawford's return to Equustek in 2001 and his permanent departure in 2005, he did not gain any ability to decipher and implement DH+ other than through working as an Equustek employee with Equustek source code and board schematics. There is no proof to the contrary, other than Mr. Crawford's assertions.

4. Dishonest conduct

[226] The plaintiffs say that Mr. Crawford has a history of dishonest behaviour. They theorize that while he worked at Equus and then Equustek, he was secretly planning to join Datalink and use what he learned to create a competing product. While at first blush this appears to be hyperbole on the part of the plaintiffs, Mr. Crawford wrote a notation in his log book in 1997, which he left behind at Equustek, "Say by [sic], bye to Bob. I go to Datalink, start new product line".

[227] Mr. Crawford admitted he wanted to leave Equus and work on other projects, but denied it was his intention to work on DH+. He said he had been bamboozled by Mr. Marsh into using Equus source code and board schematics for AAI projects.

[228] The plaintiffs point out that for the first time at trial, Mr. Crawford admitted that he used Equus board schematics and source code during the AAI episode. This was clearly dishonest behaviour that he had kept secret for years and grounds an inference that he would just as easily do it again.

[229] Mr. Crawford admittedly misrepresented his identity, as a professional engineer, by using aliases in his dealings with partners and suppliers of Datalink and with engineers at GE during the development of the QPAB. He points out that Mr. Angus also used an alias to buy a GW1000 without being found out. I observe that purchasing a product under an assumed name is a far cry from using an assumed name in a professional capacity while working with clients. In this case specifically, Mr. Angus testified that he used the alias to determine whether he was being deceived, not to deceive others for his personal benefit.

[230] The plaintiffs note that Mr. Crawford concealed the involvement of individuals other than Mr. Jack over the course of several years once the litigation began. Mr. Crawford admitted on cross-examination that he did not want the other participants to suffer from the litigation, so he answered interrogatories and questions as vaguely but correctly as he could.

Conclusion on Andrew Crawford and breach of confidence

[231] Some of the evidence relied on by the plaintiffs is insufficient, taken individually, to prove on a balance of probabilities that Mr. Crawford breached his former employer's confidence. The use of the GL34A diode, for example, was inconsequential. Similarly, the use of the same transformer, on its own, would be insignificant if Datalink had simply asked a manufacturer to copy it. Mr. Crawford, however, gave varying accounts about the origin of Datalink's transformer and his efforts to cover his tracks negatively impacted the credibility of his evidence concerning independent design.

[232] The Manchester encoder/decoder issue is another one that would have been insignificant on its own. That two software engineers used the same equation to carry out the same function is not remarkable. What was significant, however, was Mr. Crawford's evidence that he designed the PLD in the Datalink device to be different than the Equustek one, yet used the same formula and software from his old Equustek work computers to achieve the desired result.

[233] The plaintiffs' case derives its substantive force from the software fingerprints. Mr. Crawford admitted that he hard-coded 9128 Hex and E100 into the GW1000. 9128 Hex was simply copied from Equustek. As for E100, Mr. Angus admitted that he used it because Allen-Bradley did, but claimed that he arrived at the address's function by reverse engineering because Allen-Bradley did not publish E100. Mr. Crawford appears to have copied E100 from Equustek. He also copied Equustek's Active Node Table, which was Mr. Angus's solution to the Allen-Bradley patent issue in 1998.

[234] The DH+ variables and diagnostic counters were outright copies. I accept that they were part of Equustek source code and that they were neither trivial nor in the public domain. I come to the same conclusion concerning the DF1 counters. Mr. Crawford said they were published, but he could not say where he had copied them from. I accept Mr. Angus's evidence that they were not in the public domain.

[235] Mr. Crawford used Equus source code and board schematics at AAI. He began translating Equustek source code into C language before leaving Equustek. Mr. Warda testified that he saw Mr. Crawford backing up Equustek source code. Mr. Warda was a credible witness and I accept his evidence.

[236] In addition, I accept the plaintiffs' list of elements (at para. 211 above) proving, directly or indirectly, that Mr. Crawford had access to Equustek source code.

[237] Mr. Crawford did not produce any documentation in the form of lab notes or a log book to show how he reversed engineered Equustek's DH+ product and no expert evidence was tendered to substantiate his claim of independent design. As I noted earlier, I also find his credibility was negatively impacted by his pre-trial conduct and other factors. In light of this, it is regrettable that Mr. Crawford did not tender expert evidence to substantiate his claim of independent design of the GW1000.

[238] Mr. Crawford may well have begun the QPAB project believing he could design it without reference to what he had learned at Equustek, but I am satisfied on a balance of probabilities that he used confidential information, conveyed in confidence to him by Mr. Angus in the course of his employment as a professional engineer. I find that he misused this information to develop the QPAB and then the GW1000 to the detriment of his former employer.

[239] Mr. Crawford is liable for breach of confidence.

Lee Ingraham and breach of confidence

[240] The plaintiffs rely on constructive knowledge to prove the breach of confidence claim against Mr. Ingraham, citing *Cadbury Schweppes Inc. v. FBI Foods Ltd.*, [1999] 1 S.C.R. 142 at para. 19:

19 Equity, as a court of conscience, directs itself to the behaviour of the person who has come into possession of information that is in fact confidential, and was accepted on that basis, either expressly or by implication. Equity will pursue the information into the hands of a third party who receives it with the knowledge that it was communicated in breach of confidence (or afterwards acquires notice of that fact even if innocent at the time of acquisition) and impose its remedies. It is worth emphasizing that this is a case of third party liability. The appellants did not receive the confidence from the respondents, but from the now defunct Caesar Canning. The receipt, however, was burdened with the knowledge that its use was to be confined to the purpose for which the information was provided, namely the manufacture of Clamato under licence.

[241] The plaintiffs' claim against Mr. Ingraham is based on inferences from several streams of evidence, which they maintain prove that he was in communication with Mr. Crawford and Mr. Jack in advance of the QPAB, that he knew about the AAI episode, and that he did not perform due diligence to satisfy himself that the source code Mr. Crawford used for the QPAB and GW1000 was his own original work.

[242] The plaintiffs' contention that Mr. Ingraham was in closer contact with Mr. Crawford and Mr. Jack than he was prepared to admit between 1996, when he left Equus, until 2005, when the trio began working on the QPAB, is important to the plaintiffs' proof of constructive knowledge. A finding that Mr. Ingraham was in close contact with Mr. Crawford and Mr. Jack supports an inference that Mr. Ingraham

knew about the ill-fated AAI venture and other aspects of what went on between Mr. Angus and Mr. Marsh and informed his later actions.

[243] The plaintiffs point to the fact that Mr. Ingraham witnessed a document for Mr. Jack in 2002, which signified the end of the AAI episode, as part of the matrix of proof that he was in on things much earlier than he would admit. I accept Mr. Ingraham's evidence that he had no recollection of signing the document and no awareness of the AAI incident, at least insofar as it related to any form of DH+ product that would compete with an Equus product. Mr. Ingraham worked in the same building as Equus, but for a different company. The fact that Mr. Jack, an acquaintance, sought him out to witness a document is not particularly remarkable.

[244] The plaintiffs also rely on what was referred to during trial as the spam email to lee@protocolconverter.com dated February 21, 2003 as evidence that Mr. Ingraham was on board with Mr. Jack earlier than 2005. Mr. Ingraham testified that he believed the date on the spam email had been altered because he did not have an email associated with a protocolconverter.com account in 2003. He was still employed full time at a company he had worked for since his engineer in training days at Equus.

[245] While counsel for the plaintiffs scorned the notion that the email could have been backdated and maintained that Mr. Ingraham should have called expert evidence to prove how it was likely done, I accept Mr. Ingraham's evidence that he did not have a protocolconverter.com email account in 2003. I note that when Mr. Angus testified he was unsure whether a date on a document was the date it was completed or the date it was printed, because he understood the printing program might have generated the date. This illustrates that even skilled computer engineers can be confounded by the self-generated actions of computer programs.

[246] The plaintiffs maintain that Mr. Ingraham did not conduct due diligence to assure himself that Mr. Crawford was not simply copying from Equustek source code when he produced the QPAB and the GW1000. On cross-examination Mr. Ingraham said that the issue of building the product from the ground up was discussed

extensively and he trusted Mr. Crawford. Mr. Ingraham said he had no reason to believe that Mr. Crawford would be referring to or relying on any former source code or drawings or parts list in his possession. As I am satisfied he was not aware of the intricacies of the AAI episode or of Mr. Crawford's previous unauthorized use of Equus source code, I accept his evidence in this regard.

[247] The plaintiffs maintain that Mr. Ingraham did not understand the properties of the electrical components he was working with for the QPAB and later the GW1000: he did not seem to know or understand the electrical properties of the DH+ interface, including the specifications of the transformer; the function of the GL34A diode; the function of Zener diodes; and the function of ohm resistors. Those components were on the QPAB and the GW1000. If Mr. Ingraham did not understand them, the plaintiffs say he must have simply copied them from Equustek's design.

[248] Counsel for the plaintiffs attempted to build a foundation for that thesis in the following exchange from Mr. Ingraham's cross-examination:

Q I am not an engineer, but one thing I've really struggled with understanding from the beginning of this case is how either of you could possibly design a circuit without understanding what the electrical properties were of one of the key components, being the transformer.

A Well, it's not very difficult. It's just like -- you know, how do you select drawings? You just -- you have an example of a circuit, and you can figure out how it works. You have an idea of how it functions. There's nothing mysterious about a transformer. There's no magic inside a transformer. It's -- I mean, in later days -- not in the beginning but in later days I took apart the KF2 and I drew out the schematic from scratch for the DH+ interface that's in the box. I'm motioning that it's the one at the foot of your bench, My Lady. But the KF2, it's not difficult to draw out the schematic for the DH+ circuit. It's very easy. You just have a multimeter. You take the board apart. You can see where the wires are going. In the case of the KF2 you can even read the part numbers off the parts. There's no magic there. The transformer is not a very complicated thing. You can figure out what's going on.

Q So you're saying any old transformer will do. You just drop it into the board; is that right?

A No, that's not what I said. You seem to be saying that unless we had some kind of intimate knowledge about the insides of this transformer that we would be unable to make a DH+ interface work, and that's not the case.

Q That's not what I'm saying, sir. What I'm saying is in order to have all of the various discrete electrical parts in your board fit together and work you had to know what their properties were, didn't you?

A No.

Q So --

A I mean, there's a level of abstraction in everything. I mean, I don't know everything about inside my iPhone how it works, but I'm able to use it.

Q Very good, sir. I see you're not understanding my question, and I'll try again. I'm not telling you -- I'm not suggesting you need to know how many turns are in the transformer. I'm just suggesting you need to know what the electrical specifications are. Perhaps I'm using the wrong word, but don't transformers when you buy them off the shelf have a list of what their characteristics are, what the pins are or what -- the various voltages come out of the various pins, things like that?

A Sure. But I'm not really concerned with it. I haven't been -- my help hasn't been enlisted for this project for that reason. I've been asked to help with this project for the skills that I brought to the table, which was modifying the Digi design kit, creating the schematic drawing, everything except the DH+, getting the memory working, the flash working, all of the subsystems working. It's not my area of expertise, and I didn't need to know the insides of the transformer to make a hardware interface for DH+.

Q Fair enough, sir. Let's take it a couple of steps there. You, as I understand it -- first of all, obviously you didn't understand -- you didn't know anything about the electrical characteristics. I'm not asking you about what was inside. I'm saying you knew nothing about the electrical characteristics of this transformer because you had no spec for it; right?

A That's correct.

Q You also didn't understand how the GL34A diode worked; right?

A Yes. In fact there's even an email in our production that says, I don't know what this diode does.

Q Exactly.

A Brian was asking me to substitute it for something else, and I said well, I don't really know what it does, so I'd like to stick with one that has GL34 in the name and offered some suggestions. And he did so.

Q And you didn't understand what the resistors did either, the 331 resistors? You didn't know anything about that either?

A It's not my area. I wasn't asked to know anything about it.

[249] The plaintiffs also note that emails from Mr. Crawford to Mr. Ingraham attached snippets of Equustek source code. They submit that the plan from the perspective of Mr. Crawford, Mr. Jack and Mr. Ingraham appeared to be that Ingraham would transition to working on source code, but this never came to fruition. Mr. Ingraham spent most of his time working in customer support rather than

background technical work. There is no evidence he actually wrote any source code, only the plaintiffs' surmise that he did so.

[250] Mr. Ingraham acknowledged that he received emails and instant messages from Mr. Crawford with what appear to be source code attachments. He said that some of it was compiled, meaning machine readable rather than programmer readable. He denied opening it or working on it, essentially because he was not required to do so to fulfill his part of the work.

Conclusion on Lee Ingraham and breach of confidence

[251] I accept Mr. Ingraham's evidence that he was not associating with Mr. Crawford and Mr. Jack before the QPAB project in any meaningful way. I also accept that he did not have the knowledge of the AAI incident that could cast doubt on his belief that Mr. Crawford had come up with his own design for the internal working of the QPAB and the GW1000. I accept his evidence that there was a logical separation between his work and Mr. Crawford's work and that he did not need to know and inspect the details of Mr. Crawford's work.

[252] Accordingly, the plaintiffs have not satisfied me on a balance of probabilities that Mr. Ingraham is liable for breach of confidence through constructive knowledge.

Mr. Jack, the Datalink defendants and the Cheifots

[253] Nothing that arose in the evidence persuaded me that the non-participating defendants should avoid liability for breach of confidence. The deemed facts and the evidence supports the finding that they had constructive knowledge that the information used by Mr. Crawford to create the QPAB and the GW1000 was confidential.

[254] Mr. Jack was involved with the AAI episode, in which Mr. Crawford used Equus source code in an effort to create a protocol converter that would enable Mr. Jack to cut supply ties with Equus. This was his goal with the QPAB and the GW1000 as well.

[255] The Cheifots were in possession of Equustek source code at the time of the APO search. They were professional engineers. I find that they must have known they were in possession of confidential information, both because of the nature of what they possessed – source code which they did not write - and the fact that they are deemed to have that knowledge as a result of their defences having been struck.

[256] Accordingly, Mr. Jack, the Datalink defendants and the Cheifots are jointly and severally liable with Mr. Crawford for breach of confidence.

Mr. Bunker and breach of confidence

[257] I have concluded that Mr. Bunker was not part of a conspiracy and accordingly I find he is not liable for breach of confidence.

Mr. Marsh and breach of confidence

[258] I am not satisfied Mr. Marsh had any meaningful contact with Mr. Crawford and Mr. Jack during the course of the development of the GW1000. There is no evidence that he did, only the plaintiffs' theory. I have also concluded that Mr. Marsh was not part of a conspiracy and is accordingly not liable by reason of actual or constructive knowledge of Mr. Crawford's breach of confidence via his membership in a conspiracy.

Copyright

[259] The plaintiffs maintain that the defendants used, altered and reproduced Equustek's DL3500 manual to create the GW1000 manual by deleting references to Equustek and its products and replacing them with reference to Datalink and its product. The plaintiffs say the same thing was done with Equustek's DL3500 application note. Both streams of action are pleaded as violations of the *Copyright Act*.

[260] The plaintiffs say that Mr. Jack, the Datalink defendants and the Cheifots have admitted the copyright infringement by default and that the evidence shows that Mr. Crawford and Mr. Ingraham committed copyright infringement. In relation to

Mr. Bunker and Mr. Marsh, the plaintiffs rely on conspiracy for the foundation of the copyright claim against them. As noted, I have concluded that neither of them was part of a conspiracy and the copyright allegations against them are dismissed.

[261] I have also concluded that the copying in question was accomplished by an identifiable group of people, which excludes the Cheifots. Neither appears in the email threads which deal with the creation of the GW1000 manual. I dismiss the plaintiffs' copyright infringement claims against them.

[262] My analysis will focus on Mr. Crawford and Mr. Ingraham.

[263] Section 3(1) of the *Copyright Act* states:

3 (1) For the purposes of this Act, copyright, in relation to a work, means the sole right to produce or reproduce the work or any substantial part thereof in any material form whatever, to perform the work or any substantial part thereof in public or, if the work is unpublished, to publish the work or any substantial part thereof, and includes the sole right

(a) to produce, reproduce, perform or publish any translation of the work,

....

and to authorize any such acts.

[264] Section 34.1 of the *Copyright Act* states:

34.1 (1) In any civil proceedings taken under this Act in which the defendant puts in issue either the existence of the copyright or the title of the plaintiff to it,

(a) copyright shall be presumed, unless the contrary is proved, to subsist in the work, performer's performance, sound recording or communication signal, as the case may be; and

(b) the author, performer, maker or broadcaster, as the case may be, shall, unless the contrary is proved, be presumed to be the owner of the copyright.

[265] For the reproduction of a work to qualify as a copyright infringement, the law requires one or more copies of the work, or a substantial part of the work, to be made.

[266] The plaintiffs summarized a list of factors from the authorities which a court may consider in determining whether a substantial part of the work has been copied:

- a) the quality and quantity of the material taken;
- b) the extent to which the defendant’s use adversely affects the plaintiff’s activities and diminishes the value of the plaintiff’s copyright;
- c) whether the material taken is the proper subject matter of a copyright;
- d) whether the defendant intentionally appropriated the plaintiff’s work to save time and effort; and
- e) whether the material taken is used in the same or similar fashion as the plaintiff used it.

U & R Tax Services Ltd. v. H & R Block Canada Inc. [1995] F.C.J. No. 962 at para. 35; *Cinar Corporation v. Robinson*, 2013 SCC 73, cited in *Maltz v. Witterick*, 2016 F.C. 524, paras. 35-38.

[267] Counsel for the plaintiffs prepared comparative tables in their written submissions, which were derived from exhibits at trial with added underlining to highlight word for word copying of text from the DL3500 materials. The complete comparative tables are at Appendix C. The following is an excerpt which demonstrates the extensive similarities:

DL3500 User’s Guide Revision 1.04	GW1000 User’s Guide Revision 1.04
<p>1.0 DL3500 General Operation & Applications</p> <p><u>The DL3500 continues the functionality of the current DL2000/DL3000 product line.</u> It offers both the new addition of DH-485 as well as plug and play USB interface. As well as having the DH+ and 232/422/485 capabilities of the <u>DL3000</u>. The fully populated DL3500 Model will also allow Bridging between DH+ and DH485 networks in one unit. <u>New is the ability to power the DL3500 from the USB communication link,</u></p>	<p>1.0 GW1000 General Operation & Applications</p> <p><u>The GW1000 continues the functionality of the current DL2000/DL3000/DL3500 product line.</u> In addition to having connectivity to Allen-Bradley’s DH+, and the <u>RS232/422/485/USB capabilities of the DL3500</u>, the GW1000 offers a 10/100 Base-T Ethernet connection. <u>The ability to power the GW1000 from the USB communication link</u> is also present, <u>removing the sometimes cumbersome</u></p>

<p><u>removing the sometimes cumbersome procedure of location of AC or DC power supply when using laptops or PC's in the field.</u></p> <p><u>The DL3500 has two communication ports. Channel A is designed to connect to your industrial network, either A-B's DH+ or DH-485 networks. Channel B is used to connect to your serial or USB device, the protocol depends on which flavor (model) of the DL3500 you have ordered. Channel B has the capabilities of RS232C, RS422, RS485 and USB 2.0.</u></p> <p><u>Configuration of the operating parameters is done quickly and easily by the DL32 V3.X windows based software shipped with the unit or available on the Equustek Website.</u></p> <p><u>Currently there are three standard DL3500 products available to allow access to A-B's' DH-485 and DH+ network. Many other custom ASCII and serial protocols have been implemented to both DH+ and DH-485 on the DL3500 platform.</u></p> <p><u>Contact Equustek Solutions to see if the DL3500 is the correct device for your communication needs.</u></p>	<p><u>procedure of locating a DC power supply when using laptops or PC's in the field.</u></p> <p><u>The GW1000 has two communications ports. Channel A is designed to connect to your industrial Allen-Bradley DH+ network. Channel B is used to connect to your serial or USB device, the protocol depends on which model of the GW1000 you have ordered. Channel B has the capabilities of RS232C, RS422, RS485 and USB 2.0.</u></p> <p><u>Configuration of the operating parameters is done quickly and easily via the Ethernet interface. Operational Firmware is also easily upgraded over the Ethernet interface. This allows for quick changes if you need to change your protocol.</u></p> <p><u>Currently there are three standard GW1000 products available to allow access to Allen-Bradley's DH+ network. Many other custom ASCII and serial protocols have been implemented on DH+ on the GW1000 platform.</u></p> <p><u>Contact DataLink Technologies to see if the GW1000 is the correct device for your communication needs.</u></p>
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[268] The similarities between the Equustek manual and application note and the GW1000 manual and application note are obvious. I find that the GW1000 materials were copied from the Equustek materials. The real issue is who was responsible for the copying.

Who was responsible for the copying?

[269] I find that Mr. Jack stage-managed the blatant copying of Equustek’s manual and application notes because it was a shortcut for getting the GW1000 to market. There is a series of emails between Mr. Jack, Mr. Crawford and Mr. Ingraham in the spring of 2008 concerning the documentation for the GW1000.

[270] On March 4, 2008, Mr. Jack emailed Mr. Ingraham, attaching the GW1000 manual and requesting him to “go over it” and make any changes, after which it would go to Mr. Crawford, to whom Jack referred to as Derek, to finalize. Mr. Crawford was copied on this email.

[271] The document Mr. Jack attached is the GW1000 User’s Guide. In sections 7.0 through 7.4 there are a series of schematics relating to networking applications and interfaces. The schematics show pictures of the DL3500 in various modes, including Modbus. DL3500 was the name of Equustek’s product which Datalink was still selling in the spring of 2008. Equustek’s logo – the tiny horse head – is visible in the images of the DL3500. The captions and text refer to the GW1000.

[272] On March 18, 2008, Mr. Crawford emailed Mr. Jack and copied Mr. Ingraham with the subject line and attachments captioned “GW1000 Manual V1.01.” Mr. Crawford said in the text of the email “[c]hanged a bunch of things, off to bed. Look at changing the diagrams at the end before shipping!!”

[273] Mr. Crawford had obviously noticed the Equustek logo. He also worked on the DL3500 manual while still employed at Equustek. On cross-examination, Mr. Crawford was asked about the March 18 email. He acknowledged that the attached manual was created using a Word document as a template, specifically an old DL3500 Word file.

[274] On March 28, 2008, Mr. Jack emailed Mr. Ingraham and Mr. Crawford about “DL3500-DH+IAP notes”, attaching several documents, including “DL3500_DH+_IAP – DH+”. He said, “Hi Darren. Can you convert these to GW 1000

appnotes and save as pdf. There are three customers who are going to be attempting SLC 5/05 on Ethernet/IP to DH+”.

[275] On May 20, 2009, Mr. Jack emailed Mr. Crawford and Mr. Ingraham, attaching the GW1000 application notes. He said, “Derek [a.k.a. Crawford] edited the first part that i took from the User’s Guide. Darren [a.k.a. Ingraham] can you add to a version 1.06”.

[276] During cross-examination as an adverse witness in the plaintiffs’ case, Mr. Ingraham was asked about the creation of the manual and the application notes and the associated emails. Mr. Fleming suggested that he reviewed the manual and saw that they referred to Equustek products. Mr. Ingraham agreed with the first half of the suggestion, but denied that he knew the template came from an Equustek product manual. He said they were just images which could have been placeholders inserted by Mr. Jack for some reason. He denied knowing whether they originated from an Equustek manual or not.

[277] Mr. Ingraham agreed that he received Word documents from Mr. Jack that had Datalink on them in the header and footer and many incomplete sections. He filled in content so that someone receiving a GW1000 would be able to use it. He said he was not aware that the Word templates he received from Mr. Jack had their origin in Equustek manuals.

[278] Mr. Fleming showed Mr. Ingraham one section of the draft GW1000 manual, Revision 1.01 – March 1, 2008, that contained pictures of the Equustek device. Mr. Ingraham said he was not the author of that particular section. He maintained he did not know who wrote that section and that Mr. Jack had done some of his own documentation that was not available on the Equus website.

[279] Mr. Ingraham acknowledged that, at Mr. Jack’s request, he took out a reference to DL3500 in a document and inserted GW1000 in its place, which I infer is likely a reference to the request in the March 28, 2008 email. He explained that the document containing the reference to DL3500 was not in fact an Equustek

document. Datalink frequently sold bundled products to make a kit for specific applications and wrote up the supporting documentation. One of the pieces that was bundled with a DL3500 was the Digi One IAP.

[280] As for the application notes and the email of May 20, 2009, Mr. Ingraham acknowledged the email came from the account of Penelope Jans, an alias for Jennifer Ryane, who worked in the office for Morgan Jack, but that the email was authored by Morgan Jack. Mr. Ingraham did not agree that he was being asked to edit the attachment, the 1.06 document. He claimed not to know what Mr. Jack was asking him to do, although he acknowledged that Mr. Jack seemed to be marketing the GW1000 on the back of the Equustek products detailed in the attachment.

[281] In closing submissions, the plaintiffs relied on the side by side comparison of the Equustek and GW1000 manuals to illustrate how much content had been copied. This was not put to Mr. Ingraham, in whole or in part, to give him an opportunity to clearly refute the plaintiffs' suggestion that he was part of a group effort to copy Equustek manuals and application notes. Given that I found Mr. Ingraham to be a credible witness and I accept his evidence that he did not copy from Equustek manuals and application notes, this failure to confront him with a document referred to in closing is not significant.

[282] Mr. Crawford was not confronted with the side by side comparison either, but he is in a different position than Mr. Ingraham. He worked on Equustek's DL3500 manual in-house and was familiar with its contents. I infer that his reference to "changed a bunch of things" was a reference to taking parts of Equustek's manual and changing what was necessary to make Version V1.01 of the GW1000 manual.

[283] I find that Mr. Jack and Mr. Crawford copied usable elements of the DL3500 manual and application notes into a format for GW1000 customers. That collaboration resulted in the transplant of large tracts of the DL3500 written materials into the GW1000 materials.

[284] In addition to a defence of denying the obvious reference to Equustek in the manuals and application notes, Mr. Crawford (and Mr. Ingraham) relied on the evidence of Mr. Marsh to support a defence that what was copied did not originate from the plaintiffs.

[285] Mr. Marsh testified that he wrote most of the manual for the DFK1000, Mr. Angus's first protocol converter, which was a stepping stone to the DL2000. I accept Mr. Marsh's evidence in this regard; however, the defendants did not adduce any evidence as to how the DFK1000 manual was related to the DL3500 manual. The only similarity between the two manuals is that they refer to a protocol converter. The plaintiffs have pleaded the GW1000 manual was effectively a straight "rip-off" of the DL3500, not the DFK1000. As I noted earlier, the similarities between the manual for the DL3500 and the GW1000 are painfully obvious.

[286] In summary, I conclude Mr. Jack and Mr. Crawford knowingly and intentionally copied a vast quantity of Equustek's manual and application notes to save time and effort. The material was used in the exact same fashion as the plaintiffs used it. The material that was copied is the proper subject matter of a copyright.

Passing Off and the *Competition Act*

[287] The plaintiffs have pleaded both the tort of passing off and a statutory cause of action under the *Competition Act*, R.S.C. 1985, c. C-34. The two causes of action are similar. Passing off requires proof of an additional element (goodwill) that is lacking in the statute. The plaintiffs addressed passing off first in their submissions and I have adopted that order of analysis.

[288] The plaintiffs maintain that Mr. Jack, the Datalink defendants and the Cheifots have admitted passing off by default. As I will discuss shortly, Mr. Jack and the Datalink defendants are clearly liable on the evidence for passing off as well as by default. I am not satisfied, however, that the pleadings support the conclusion that the Cheifots should be found liable by default as their involvement in this alleged activity is not clearly delineated.

[289] The plaintiffs maintain that Mr. Crawford, Mr. Ingraham and Mr. Bunker are directly liable and Mr. Marsh is liable as an accessory.

Passing off

[290] In *Vancouver Community College v. Vancouver Career College (Burnaby) Inc.*, 2017 BCCA 41, Saunders J.A., for the Court, observed that the common law developed the tort of passing off, which was also prohibited in s. 7 of the *Trade-Marks Act*:

[29] The leading authority in Canada on passing off is *Ciba-Geigy Canada Ltd. v. Apotex Inc.*, [1992] 3 S.C.R. 120. Justice Gonthier, for the Court, discussed passing off in the context of the similar visual presentation of different pharmaceutical products. He said:

33 The three necessary components of passing-off action are thus: the existence of goodwill, deception of the public due to a misrepresentation and actual or potential damage to the plaintiff.

[30] In *Greystone Capital Management Inc. v. Greystone Properties Ltd.*, 87 C.P.R. (3d) 43 (B.C.S.C.) Madam Justice Stromberg-Stein accurately summarized the three components at para. 27:

1. The existence of reputation or goodwill at the relevant time. This includes consideration of whether the plaintiff was recognized by the trade name and whether the trade name was distinctive within the relevant field of activity.
2. A misrepresentation leading the relevant public to believe there is a business association or connection between the parties. This includes consideration of whether the defendants' use of the trade name is likely to deceive the relevant public. Any misrepresentation need not be deliberate and proof of intent is not necessary. Evidence of likelihood of confusion, leading to the possibility of lost business opportunity is relevant. However, the establishment of actual confusion is not required.
3. Damage or potential damage flowing to the plaintiff as a result of any misrepresentation due to loss of control over its reputation is presumed.

[291] In *Ciba-Geigy*, Gonthier J. put the issue in simple terms, at para 50:

The customer expects to receive a given product when he asks for it and should not be deceived. It often happens that products are interchangeable and that a substitution will have little effect. However, the customer may count on having a specific product. There are many reasons for such a choice: habit, satisfaction, another person's recommendation, the desire for change, and so on. I have no hesitation in using the classic saying, taken

from popular imagery: "the customer is always right". Merchants must respect his wishes, choices and preferences as far as possible. Where this is simply not possible, no substitution must be made without his knowledge. That is the minimum degree of respect which manufacturers and merchants, who we should remember depend on their customers, should show. [underlining in original]

The three elements of passing off

1. Goodwill

[292] In *Vancouver Community College*, Saunders J.A. referred to earlier authorities concerning the goodwill branch of the tort of passing off:

[37] In the 1901 case *IRC v. Miller & Co. Margarine Limited*, [1901] A.C. 217 (H.L.), Lord McNaughton provided this definition of goodwill at pp. 223-224:

... What is goodwill? It is a thing very easy to describe, very difficult to define. It is the benefit and advantage of the good name, reputation, and connection of a business. It is the attractive force which brings in custom. It is the one thing which distinguishes an old-established business from a new business at its first start.

[38] Justice Binnie described goodwill in *Veuve Clicquot Ponsardin v. Boutique Cliquot Ltée*, 2006 SCC 23 at para. 50, as "[i]n ordinary commercial use, it connotes the positive association that attracts customers towards the owner's wares or services rather than those of its competitor".

[293] Counsel for Mr. Bunker and Mr. Ingraham took the position that the plaintiffs did not tender any evidence concerning goodwill and the passing off claim essentially fails at the first hurdle. These submissions do not take into account the body of evidence from which it can be readily inferred that Equustek products enjoy a good reputation with consumers. As one example, the company has been profitable since inception, at least until 2008 when Datalink began selling the GW1000, and its predecessor Equus was also profitable.

[294] Datalink sold the GW1000 through its websites which marketed Equustek products for a number of years while Datalink was still Equustek's distributor. The inference that Datalink as a business was preparing to ride on Equustek's coattails arises from the fact that it suppressed the GW1000 through the hyphenated, unindexed website while accepting orders for Equustek products and then shipping

the GW1000. This was a classic “bait and switch”. If Equustek’s products (the bait) did not enjoy a favourable reputation, and goodwill, there was no logical reason for Datalink to continue to promote Equustek products publicly but covertly provide the GW1000 (the switch) to customers seeking Equustek products.

[295] Mr. Ingraham acknowledged on cross-examination that on at least one occasion he received an email from a customer who had purchased a DL3500 DH+, an Equustek product, but had received a GW1000 DHP1 instead. He agreed that the customer’s reference to a “note in the box” was a reference to the letter that went out with the GW1000 telling consumers it was an update and replacement of the DL3500 and other Equustek products. Again, Datalink was associating its GW1000 to Equustek products. The only rational inference is that this was done to capitalize on Equustek’s good reputation to get the GW1000 into the market.

[296] Mr. Crawford was asked about the same letter. He claimed not to know what Mr. Jack and Datalink were actually attempting to achieve through the letter, but admitted he was aware that Mr. Jack was continuing to solicit orders for Equustek products on the Datalink website and then sending a replacement product. The replacement product was obviously the GW1000. Mr. Crawford said, however, that he was not privy to purchase orders, invoicing and shipping labels.

[297] Mr. Ingraham agreed that he became aware in early 2008 that Datalink shipped GW1000 products in response to orders for Equustek products and that Datalink was claiming the GW1000 was an upgrade or a replacement of Equustek products. He said it caused him difficulty at times, in his role in tech support for Datalink, while Datalink was selling both Equustek products and the GW1000. He did not enjoy his tech support role, in particular, dealing with confused customers who had received products with different product numbers than they ordered from Mr. Jack. Customers who already had a DL3500 would receive a GW1000 instead of another DL3500 or other Equustek model.

[298] There is other evidence which demonstrates Equustek products had goodwill in the marketplace. The defendants did not suggest to Mr. Angus or Mr. Huth, his

sales manager, that Equustek devices were being routinely returned as defective. Nor did they suggest to Mr. Angus that his products lacked goodwill in the industrial protocol community, except in challenging his statement about Equustek's market share. The company was clearly making a profit in the years leading up to Datalink's deceptive marketing of the GW1000. And Equustek was ultimately granted trademark protection over some of its product names.

2. Misrepresentation

[299] The bait and switch tactics demonstrate that Mr. Jack and Datalink were using Equustek's goodwill to get its devices into the marketplace by confusing consumers. The bait and switch tactics also demonstrate misrepresentation by Datalink about the GW1000 – that it was a replacement or upgrade of Equustek's products.

[300] There were other aspects of misrepresentation, some more subtle than others. One of the more subtle examples cited by the plaintiffs was Mr. Crawford, as Derek Smythe, suggesting to GE that he could draw on certain intellectual property and source code to complete the QPAB job for them. Mr. Crawford emailed a representative of GE, in the context of explaining a delay in the design phase, and referred to the 8-bit Zilog processor which he had used in the past. The Equustek product ran on an 8-bit Zilog processor. Mr. Crawford passed this off as a bit of puffery undertaken at the behest of Mr. Jack, who wanted to give the impression that the Equustek products on the Datalink website were his products.

[301] Misrepresentation was also achieved through website manipulation. Datalink kept the GW1000 secret by Mr. Jack directing the creation of its non-indexed website, which was only referred to in the letter to customers that was shipped out with the GW1000. Equustek products would come up in searches, generating orders to Datalink for the products, then the GW1000 and its letter with the non-indexed website would be sent out. Mr. Jack conveyed this concealment strategy to Crawford, Ingraham and Bunker in an email sent to them on February 29, 2008:

Hi Guys,

Please see attached product sheet. I quickly did the GW new names so please comment on any changes.

Lee can you take these specs sheets and update with our GW specs.

Mike just upload for now on www.datalink-networks.com and we can edit on the next round.

Datalink-Networks.com will be the home of the GW1000 information that won't be recognized by google for now. All of GW1000 documentation will point to this site and the downloads can have our GW1000 manuals and firmware etc. This will make it more legit for customers just receiving new GW1000 products.

[302] Mr. Jack said in an affidavit filed in the early stages of the litigation:

[41] I featured the GW1000 products (along with the older "DL" products) on one of my websites, www.datalink-gateways.com. I caused this website to be de-indexed so that it would not be readily searchable by search engines like "Google". I put this website on my GW1000 products and provided it to customers who purchased my GW1000 products. I took these measures so that Mr. Angus would not discover my development of the GW1000 and try to put me out of business before I had been able to establish a market presence.

[303] Mr. Jack's statement that he provided the website to customers who purchased his GW1000 products was not entirely true. The website was provided to customers who sought to purchase products from Datalink, including Equustek products, but received the GW1000 and the product insert with the unindexed website instead.

3. Damage or potential damage

[304] As I will discuss in further detail when I deal with damages, Equustek's sales began to decline around the same time that Datalink began pushing the GW1000. I find that Datalink's activities were a contributing cause of the decline in sales.

Who was actually involved in the tort of passing off?

Mr. Crawford and Mr. Ingraham

[305] Mr. Jack was unquestionably the architect of the marketing plan that saw Datalink offer the GW1000 as a replacement for Equustek products. I find he did so

to take advantage of Equustek's reputation and promote his own product. Datalink was his company. It was not run as a collective with others. Mr. Jack controlled the messaging on the websites and he appears to have been the point of first contact with customers, issuing them quotes and then referring them to Mr. Ingraham if they had technical questions.

[306] Mr. Ingraham knew of Mr. Jack's marketing plan and while he did not think it was the best practice, he continued working for Datalink just as others did, such as Jennifer Ryane. He did not control how Datalink advertised the GW1000 or how Mr. Jack communicated with customers about the relationship between the GW1000 and Equustek protocol converters. He was not a party to the distribution agreement between Datalink and Equustek. On at least one occasion Mr. Ingraham suggested selling an Equustek product because the GW1000 that had been shipped did not meet the customer's needs.

[307] Put at its most damning, Mr. Ingraham gave customers the impression that the GW1000 was a replacement for Equustek's products that were previously offered by Datalink. He did not tell customers that they could not buy Equustek products generally, only that they were not available from Datalink.

[308] This is a fine distinction, but Mr. Ingraham was not driving the Datalink push to draw customers of Equustek products in and send them the GW1000. He did not control Datalink or the content of its internet messaging and he did not correct misapprehensions created by Mr. Jack's marketing tactics.

[309] Mr. Ingraham's conduct bordered on deceitful, but I am not satisfied on a balance of probabilities that his actions satisfy the three-part test of passing off or that he was acting as a joint tortfeasor with Mr. Jack.

[310] Mr. Crawford's misrepresentation to GE that he could draw on certain intellectual property and source code to complete the QPAB was apparently done to create the impression that Datalink was more than the three people who met with GE, but it is too subtle to ensnare him in liability for passing off. Mr. Crawford was

centrally involved in using Equustek's confidential information, manuals and application notes to construct the QPAB and GW1000, but he did not take an active role in marketing or in customer support and I am not satisfied he was "out there" supporting Mr. Jack's marketing plan. I am not satisfied that he is liable for passing off.

Mr. Bunker

[311] The plaintiffs argue that Mr. Bunker carried out Mr. Jack's requests to create the website which could not be searched and later on created a succession of websites that had the effect of circumventing the Google order and continuing the sales of the GW1000.

[312] Mr. Bunker understood Mr. Jack to be a reseller of hardware devices used in automated factories. He did not regard Mr. Jack as an important client and between 2005 and 2014, billed him a total of \$66,000 for work. Mr. Bunker did a few hours of office work in 2005 for Mr. Jack and some website work after that. He worked remotely, as he lived for a time in Argentina and then Montreal. Mr. Jack would provide a domain name for a website and ask Mr. Bunker to create the look of the website. He provided all the content to Mr. Bunker to upload and retained control over the website as the administrator.

[313] Mr. Bunker created websites for Mr. Jack that were hosted outside Canada. He said this was a normal thing to do because people tend to favour websites hosted in their own countries. Mr. Bunker also edited some documents for Mr. Jack before they were posted on Datalink websites.

[314] Mr. Bunker did not regard the hyphenated Datalink website as a secret one. He explained that when a new website is built, "you never want to index it in Google when it's not ready; otherwise the first impression when someone sees the site is it's incomplete and they're not going to take it seriously." As a result, a new website can be kept "turned off" and out of site of Google or other indexing systems until the

client is ready to make it go live. This was a normal service Mr. Bunker provided to his clientele.

[315] In 2012, Mr. Bunker learned that Mr. Jack and his supplier were in a dispute. He was asked by Mr. Jack to change things on websites, but he did not obtain any further detail. When Mr. Bunker was added to the litigation in 2014, he was furious with Mr. Jack and demanded some compensation for upcoming legal bills. Mr. Jack gave him \$5,000.

[316] The plaintiffs cross-examined Mr. Bunker extensively on their belief that he was deeply involved in and knowledgeable about what Mr. Jack was doing. One particular point that was pursued was the suggestion that Mr. Bunker met with Mr. Jack in Bellingham in early 2014. Mr. Jack emailed Mr. Marsh in this time frame and referred to an unpleasant meeting and an individual identified only as "ME". He also referred to Mike Bunker by name in the same email.

[317] Mr. Fleming maintained that ME was Mike Bunker, but I find that cannot be the case. It would be ridiculous to refer to someone by a code name and then also by their real name in the same document.

[318] For his part, Mr. Bunker adamantly denied meeting with Mr. Jack in this timeframe. He produced records concerning his travel to and from the United States. There was no notation in those records that he had travelled between Canada and the United States in the relevant timeframe.

[319] I believed Mr. Bunker's evidence on this point. My conclusion was further fortified by an APO document which contains references to an individual with the initials ME, who had an Adelab email account. There is no evidence Mr. Bunker was ever given an Adelab account or used any email other than ones which identified him by name, except the Brian Bach email which I accept was created solely to circumvent a limit placed by Google Analytics on the number of accounts in one person's name.

[320] Mr. Bunker said that he had no knowledge of the Google orders until some time after he was joined in the litigation, so he made the changes that Mr. Jack requested to the various Datalink websites without knowing much more than that Mr. Jack and his supplier were in some kind of dispute. Mr. Jack said he was being harassed by an aggressive competitor and Mr. Bunker accepted the explanation. He also accepted the explanation that people working for Datalink used aliases because Mr. Jack wanted to make the company look bigger.

[321] Mr. Bunker agreed that he made images on websites smaller or blurrier at Mr. Jack's request, but had no reason to be suspicious because of his understanding that Mr. Jack was a reseller of products.

[322] Mr. Bunker identified an email he received from Mr. Jack on April 5, 2012 asking him to remove all content from a website, abgateways.com, so it could not be uploaded by Equustek. Mr. Jack referred in the email to going into default judgment on April 30. Mr. Bunker did not know what a default judgment was and had no idea of the status of the litigation at that time. He thought there was something wrong at Mr. Jack's end but did not talk to him about it because it was not his business and he was not involved.

[323] Mr. Bunker agreed that Mr. Jack emailed him in June 2012, asking him if he was available over the next couple of days to make fast changes to websites and remove any Equustek things from websites. There was also a reference to disclaimers and defending strategically. Mr. Bunker said he was available to do the work but testified that he was not participating in any legal defence, nor did he have any knowledge of what was transpiring. He denied using instant message systems to avoid email trails of communication with Mr. Jack.

[324] I accept Mr. Bunker's explanations that he was a contractor who carried out his customer's instructions, had no vested interest in Datalink apart from his interest in getting paid for piece work, and while naïve in retrospect I am not satisfied on a balance of probabilities that he is liable for passing off.

Mr. Marsh

[325] Mr. Marsh used the phrase “bait and switch” in an email with Mr. Jack, long after Mr. Jack had adopted his underhanded marketing techniques. I am not satisfied Mr. Marsh was involved with developing or carrying out Mr. Jack’s marketing plan.

The Competition Act

[326] The plaintiffs plead the *Competition Act* as an alternate form of relief to the tort of passing off. Section 52(2) provides:

52 (1) No person shall, for the purpose of promoting, directly or indirectly, the supply or use of a product or for the purpose of promoting, directly or indirectly, any business interest, by any means whatever, knowingly or recklessly make a representation to the public that is false or misleading in a material respect.

(1.1) For greater certainty, in establishing that subsection (1) was contravened, it is not necessary to prove that

- (a) any person was deceived or misled;
- (b) any member of the public to whom the representation was made was within Canada; or
- (c) the representation was made in a place to which the public had access.

[327] The statutory cause of action for damages is in s. 36:

36 (1) Any person who has suffered loss or damage as a result of

- (a) conduct that is contrary to any provision of Part VI, or
- (b) the failure of any person to comply with an order of the Tribunal or another court under this Act,

may, in any court of competent jurisdiction, sue for and recover from the person who engaged in the conduct or failed to comply with the order an amount equal to the loss or damage proved to have been suffered by him, together with any additional amount that the court may allow not exceeding the full cost to him of any investigation in connection with the matter and of proceedings under this section.

[328] The plaintiffs rely on the same acts for the statutory action as they do for the tort, noting that the statutory action does not require proof of goodwill. My

conclusions on this avenue of liability are the same as my conclusions on passing off.

Breach of contract (the distribution agreement)

[329] The plaintiffs allege that Mr. Jack and the Datalink defendants breached the distribution agreement with Equustek, causing loss and expense. Equustek sold products to its own customers, but also sold its products to Datalink so that it could act as Equustek's distributor. This was a continuation of the oral agreement that Mr. Angus and Mr. Marsh operated under.

[330] The terms of the agreement that the plaintiffs have pleaded are that Equustek would sell its products to Datalink at a 30% discount from Equustek's standard price. Datalink would distribute Equustek's products and was entitled to advertise them, display images of them on Datalink websites and in sales materials and make Equustek manuals available to customers. When a customer ordered an Equustek product from Datalink, Datalink would fill the order with the Equustek product.

[331] The plaintiffs plead that the sale and display of Equustek products on Datalink's websites generated considerable traffic and that Mr. Jack and the Datalink companies took advantage of the goodwill of Equustek products to maximize the chances of customers looking for Equustek products being directed to Datalink websites which had no authorization under the distribution agreement to use the plaintiffs' trademarks. Those websites are:

www.protocolconverter.com;

www.datalinkgateways.com;

www.abgateways.com;

www.datalink-gateways.com;

www.datahighwayplus.com;

www.datalink-networks.com;

www.datalinktek.com

www.datanetprotocols.com
www.1770-kf3.com;
www.1770-kf2.com;
www.1784-pktx.com;
www.1784-ktx.com;
www.1784-pcmk.com;
www.ethernetgateways.com;
www.control-logix.com; and
www.ethernetipsolutions.com.

[332] The plaintiffs maintain that there are other websites of which they are not aware.

[333] The plaintiffs also claim that Mr. Jack and the Datalink defendants breached the distribution agreement by the “bait and switch” – filling orders for Equustek products with the GW1000.

[334] I am satisfied that the plaintiffs should have judgment against Mr. Jack and the Datalink defendants for breach of contract as set out in the pleadings.

[335] The plaintiffs also seek judgment against the Cheifots for breach of contract, as it is one of the unlawful means alleged as a basis of the conspiracy. While it likely makes no practical difference, given that I have found the Cheifots conspired with Mr. Jack and the Datalink defendants in other ways, there is no privity of contract between the Cheifots and Equustek and I am not satisfied there should be a finding of liability against them in this respect.

Conspiracy

[336] A conspiracy consists of an agreement between two or more people who take concerted action towards a common goal, either by unlawful means or with a predominant purpose of causing harm (actual damage) to the plaintiff: *Canada*

Cement LaFarge Ltd. v. British Columbia Lightweight Aggregate Ltd., [1983] 1 S.C.R. 452 (S.C.C.); *Can-Dive Services Ltd. v. Pacific Coast Energy Corp.* (1993), 96 B.C.L.R. (2d) 156 (C.A.), leave to appeal to SCC ref'd: [1993] 3 S.C.R. viii (note).

[337] In *Youyi Group Holdings (Canada) Ltd. v. Brentwood Lanes Canada Ltd.*, 2019 BCSC 739; appeal dismissed 2020 BCCA 130, Mayer J. succinctly summarized the elements of both branches of civil conspiracy and the burden of proof:

[117] The British Columbia Court of Appeal acknowledged at para. 49 of its decision in *XY, LLC v. Zhu*, 2013 BCCA 352, that there is not a great deal of case law in Canada on the meaning of “unlawful means” or “unlawful act” in the context of civil conspiracy. The Court of Appeal referenced the decision of the Ontario Court of Appeal in *Agribrands Purina Canada Inc. v. Kasamekas*, 2011 ONCA 460 at para. 38, which included the following remarks:

What is required, therefore, to meet the “unlawful conduct” element of the conspiracy tort is that the defendants engage, in concert, in acts that are wrong in law, whether actionable in private law or not. ...

[118] In either of the two situations outlined in *Canada Cement*, the party alleging a civil conspiracy must be able to demonstrate actual damage resulting from the wrong-doers conduct: *Cement LaFarge* at 472.

[119] The evidentiary burden to prove civil conspiracy is high and requires proof by compelling evidence. Compelling evidence is required either directly or by inference that there was an agreement between two or more parties which was implemented with resulting harm to the plaintiff. Proof must be plainly established and where a party seeks to prove conspiracy inferentially the facts must be such that they cannot fairly admit of any other inference being drawn from them: *Golden Capital Securities Limited v. Rempel et al*, 2004 BCCA 565 at paras. 46-47, referring to, in part, *Sweeney v. Coote*, [1907] A.C. 221 at 222; *Bronson v. Hewitt*, 2013 BCCA 367 at para. 98.

[120] It is often the case that there is no direct evidence of a conspiracy as the conspirators often make extensive efforts to cover their tracks. In these cases, it becomes necessary for conspiracy to be established by inference from the totality of the evidence, which may include a consideration of several isolated incidents: *Canadian Community Reading Plan Inc. v. Quality Service Programs Inc.*, 10 B. L.R. (3d) 45 (Ont. C.A.), at para. 25, citing *R. v. Paradis* (1933), [1934] S.C.R. 165 (S.C.C.) at para. 168.

[338] The conspiracy in this case is delineated in the pleadings in the following terms:

33. At a time unknown to the Plaintiffs, the Defendants Jack, Colin Marsh, Kathleen Marsh, Crawford, Ingraham, Bunker, Igor Cheifot, Alexander Cheifot, Geiger, Alfonso Doe, and John Doe, and those of the Datalink Companies that were then in existence, agreed to act in concert using unlawful means to destroy Equustek's business in order that they could appropriate all of Equustek's business, profits, and goodwill for themselves. [underlining added]

34. This intention to harm the Plaintiffs was the predominant purpose of the Defendants at all material times.

35. The acts done in furtherance of the conspiracy, and the unlawful means used, include:

- a) stealing the Plaintiffs' Trade Secrets, below, in order to build the Datalink Products, as set out below;
- b) claiming Equustek's products as their own, and misrepresenting to the public that their own products were an upgrade or replacement of the Equustek products, which they said were no longer available;
- c) using the Plaintiffs' trademarks to drive traffic to the Datalink websites on the false pretense that they intended to sell the Equustek products under the Distribution Agreement;
- d) breaching the Distribution Agreement;
- e) infringing the Plaintiff's copyrights;
- f) organizing their assets and their corporate structure to make it as difficult as possible for the plaintiffs to identify who is involved, recover their intellectual property, or collect any damages;
- g) using false names in their dealings with their customers;
- h) using false names in their communications with one another, in order to create a false documentary record to be revealed in this litigation, in order to make it as difficult as possible for the plaintiffs to discover the truth about these events;
- i) giving false or misleading evidence and further concealing documents in these proceedings, in order to prevent the plaintiffs from discovering the full scale of the conspiracy;
- j) continuing to carry on business, or assisting Jack and the Datalink Companies to carry on business, after they had been prohibited from doing so by orders of this court;

- k) carrying on their scheme under multiple fictional corporate names, including:
 - i. Advanced Industrial Networks Inc.;
 - ii. Multigate Communications Inc.;
 - iii. American Gateway Corp.;
 - iv. Gateway Technologies Inc.; and
 - v. Industrial Automation Company;or variations of these names;

and further particulars are set out in the balance of this Statement of Facts.

[339] The defendants deny the existence of a conspiracy and, if one is found to have existed, their membership therein.

[340] The plaintiffs have proven that Mr. Crawford is liable for some of his actions in respect of the development and marketing of the GW1000: breach of confidence and *Copyright Act* violations. The non-participating defendants are liable for tortious conduct. Mr. Bunker and Mr. Ingraham are not liable. Mr. Marsh's liability depends on whether or not I find his provision of litigation advice is sufficient to prove he was part of the conspiracy.

[341] In light of my findings that some of the defendants are liable in some fashion for acts harmful to the plaintiffs, my analysis will focus on the unlawful act branch of conspiracy. There is insufficient evidence to conclude that the defendants engaged in acts with the predominant purpose of causing the plaintiffs harm. There is evidence that the defendants who knew Mr. Angus personally made disparaging comments about him on occasion, but it falls far short of malice or anything indicating the purpose was to cause him and the corporate plaintiffs – effectively his alter egos - harm.

[342] The plaintiffs' conspiracy theory is very broadly cast and deeply rooted in the history between Mr. Angus and Mr. Marsh. Mr. Fleming submitted that the

conspiracy continued in existence to the present day, noting that Mr. Crawford and Mr. Ingraham sat near each other during the trial and shared binders of materials.

[343] The plaintiffs maintain that the agreement grounding the common purpose between Mr. Jack, Mr. Crawford, Mr. Ingraham and Mr. Bunker was to accomplish the following:

- a) design and sell the GW1000 and other products as replacements for existing Equustek products;
- b) use Mr. Crawford's expertise from Equustek, despite a failure to undertake due diligence on the lawfulness and origin of Mr. Crawford's work at Datalink;
- c) clandestinely, use Equustek's existing customer list, built by Datalink over the years as Equustek's distributor, to develop a customer base for the new Datalink products while continuing to act as Equustek's distributor;
- d) convert customers of Equustek into Datalink customers by claiming that the GW1000 was an upgrade or replacement for Equustek products and by sending Datalink products to customers who purchased an Equustek product (i.e. "bait and switch");
- e) benefit from increased profits of manufacturing and selling their own products as Datalink, rather than simply the distributor's markup from selling Equustek products.

[344] The plaintiffs submit that these activities, combined with the use of aliases, a secret Datalink website featuring the GW1000 and the secrecy associated with this plan, all support the inference that the defendants agreed to the common purpose, although clearly they were not all in on the agreement when it was first conceived.

[345] Further, the plaintiffs argue that the coordinated response to the litigation, which included protecting names, use of aliases to prevent identification in document disclosure, Mr. Jack's disappearance to carry on work and avoid document

production, as well as Mr. Jack and Mr. Marsh's apparent monitoring of the litigation remotely, all point towards an agreement coupled with concerted action to achieve the common objectives of the group. The plaintiffs also suggest that Mr. Crawford was set up to take the fall for the conspiracy if that became necessary.

The non-participating defendants

Morgan Jack

[346] Mr. Jack was undoubtedly the impetus behind the QPAB project and the GW1000. As the owner/operator of Datalink, it was in his interests to develop a product that he controlled to maximize his profits. By virtue of the non-participation of Mr. Jack and the Datalink defendants in this trial, the plaintiffs are entitled to judgment against them pursuant to the allegations in the pleadings.

The Cheifots

[347] Both of the Cheifots provided services to Datalink. Igor Cheifot described himself on a resume as a senior software engineer with Datalink since 2005. He was part of email threads involving various issues and, as the APO search revealed, he was in possession of at least a part of Equustek's source code.

[348] Alex Cheifot was also involved with working on Datalink products, although it appears his role was focussed more on hardware issues. He worked on a daughterboard issue for Datalink. Alex Cheifot was also responsible for solving a problem that the GW1000 had at its inception: weakened signal transmission which meant that the GW1000 could not be relied upon to execute commands at distances of 10,000 feet or more. This was the Allen-Bradley standard which Equustek products matched.

[349] The Cheifots used aliases, possessed Equustek source code and remotely changed their passwords after the APO was executed, which prevented Mr. Cree from digging deeply into their servers for potentially relevant documents.

[350] The plaintiffs pleaded the same elements of conspiracy against the Cheifots as outlined against Mr. Jack and the Datalink defendants. In the alternative, at para. 49C, they say that if they were not among the original parties to the conspiracy, they joined at a later time and knew, or ought to have known, that some of the other defendants were designing and building the Datalink products using trade secrets. Therefore, they knowingly assisted them in their unlawful use of trade secrets and/or other unlawful acts set out in the statement of facts.

[351] I find that the other unlawful act pleaded that is directly related to theft of trade secrets is the alternative pleading, breach of confidence, and I have addressed the Cheifots' liability for that earlier in these reasons.

[352] The plaintiffs also allege that the Cheifots knowingly received proceeds of use of the trade secrets and sales of the Datalink products and/or aided and abetted the other defendants, or some of them, to breach their duties to the plaintiffs, to carry out the unlawful means, and in furtherance of the conspiracy alleged above. The allegations are undefended and the plaintiffs are entitled to judgment against the Cheifots for the tort of conspiracy.

The participating defendants

Andrew Crawford

[353] Mr. Crawford committed a breach of confidence by using Equustek source code to create the QPAB and then the GW1000 at the behest of Mr. Jack. He also participated in copying portions of Equustek's DL3500 manual and application notes, infringing copyright in the process.

[354] Mr. Crawford diligently used aliases to conceal his identity, primarily to avoid Mr. Angus coming across his name in the protocol converter world. I find his desire to avoid notice by Mr. Angus was fueled by his fear of becoming involved in litigation, not just because Mr. Angus was likely to resort to litigation, but because Mr. Crawford actually had something to hide: the use of Equustek's source code.

[355] Mr. Crawford appears to have received minimal financial recompense for his efforts, but believed Mr. Jack would “take care” of him. I formed the impression that while Mr. Crawford is an educated individual, he is easily led by others and very loyal to his friends. This explains his faith in Mr. Jack as well as his slow compliance with document disclosure and with identifying others who worked on the development of the GW1000.

[356] The plaintiffs theorize that the defendants as a group decided to leave Mr. Crawford behind as a sort of rear guard to defend the litigation. I do not accept that the defendants were as sophisticated and organized as that. Mr. Jack, and later the Cheifots, abandoned the litigation for reasons known only to themselves. Mr. Crawford remained in the Lower Mainland and defended the litigation because he has a job and a family here, not because he is the sacrificial litigation lamb for the defendants.

[357] Mr. Jack did not run Datalink as a cooperative enterprise. It was his company and he took steps to ensure its success at the expense of Equustek. Mr. Crawford did not benefit in any significant way from his work on the QPAB or the GW1000. He did not have an ownership stake in Datalink. I am not satisfied he was part of an agreement to act in concert using unlawful means to destroy Equustek’s business and appropriate all of Equustek’s business, profits and good will for the members of the conspiracy, and therefore do not find Mr. Crawford liable for conspiracy.

Lee Ingraham

[358] I am not satisfied that Mr. Ingraham knew or had reason to believe the QPAB or the GW1000 were built with Equustek’s trade secrets. He used an alias and he was aware Mr. Jack used somewhat underhanded marketing tactics, but I am not satisfied he was part of an agreement with Mr. Jack and others to carry out unlawful acts for collective economic gain.

[359] Mr. Ingraham had no economic interest in Datalink’s business apart from working as a contractor and there is no evidence he had an expectation of a big

payout at some point for his efforts. He assisted with moving Datalink to Mexico after the litigation began, but I am satisfied he did so because he wanted to move on to other work and that Mr. Jack was beginning to have some difficulties paying him, not because he was furthering the goals of a conspiracy he had joined. I am also not persuaded that he was dilatory or selective with producing lists of documents in order to thwart the plaintiffs' efforts to uncover evidence.

[360] I dismiss the conspiracy claim against Mr. Ingraham.

Mike Bunker

[361] The only agreement Mr. Bunker had with Mr. Jack was to provide contract website work on demand. I have dismissed all of the plaintiffs' discrete tort claims against Mr. Bunker and the evidence I have accepted does not support the plaintiffs' claim that Mr. Bunker conspired with Mr. Jack and others against the plaintiffs.

Colin Marsh

[362] The plaintiffs theorize that Mr. Marsh's sale of his business to Mr. Jack was a sham to make Mr. Angus think Mr. Marsh was out of the picture when in fact he was waiting in the wings for Mr. Jack and the others to manufacture the GW1000 and unfairly compete with Equustek, at which point he would realize a financial payoff. Mr. Marsh effectively erased the paper trail of his involvement when he admittedly destroyed documents in his possession and asked others to do the same. As a result, the plaintiffs say an adverse inference should be drawn against him and he should be found a member of a conspiracy with Mr. Jack and others.

[363] The plaintiffs maintain that Mr. Marsh's actions – counselling Mr. Jack's response to the litigation, destroying documents and suggesting ways to market the GW1000 and other Datalink projects - qualify as unlawful acts sufficient to ground his liability in conspiracy. The plaintiffs acknowledge, however, that the jurisprudence concerning unlawful acts that do not constitute torts or criminal conduct is not particularly well developed.

[364] Mr. Marsh maintains that he sold his business to Mr. Jack and moved to France. He had contact with Mr. Jack about twice a month for a few months concerning the business, but after that it appeared that Datalink was doing well (or at least well enough to eventually pay Mr. Marsh most of the \$10,000 owing for the sale of Sage to Jack) and his advice was not needed. He and his wife Kathleen stayed in contact with Mr. Jack for social reasons.

[365] Mr. Marsh learned in 2006 or 2007 that Mr. Jack was selling a new product. Mr. Jack did not ask him to get involved and Mr. Marsh conveyed to him that the product was a mistake because it would compete with Mr. Angus's product and provoke a lawsuit. He believed that Mr. Crawford and Mr. Jack had engineered the product themselves.

[366] Mr. Jack told Mr. Marsh about the lawsuit in late 2011 or early 2012. Mr. Marsh regarded it as a lawsuit about a product that actually belonged to Allen-Bradley which Mr. Angus had simply copied and called his own. Mr. Marsh said he had a real fear of Mr. Angus detecting his involvement in conversations with Mr. Jack. He mostly used an email address associated to the name Firth, which was his birth name.

[367] Mr. Jack persuaded Mr. Marsh that his experience and background would be useful to him. The first issue that Mr. Marsh commented on was a company's request of Datalink in March 2012 for a Remote I/O device. Mr. Marsh did not see this as a problem because it did not involve the DH+ network and would thus not run afoul of Mr. Angus's proprietary view about DH+ products.

[368] Mr. Jack copied Mr. Marsh on emails about a Mexican company that would run its financials through Panama, but Mr. Marsh said he wanted nothing to do with it, particularly since the company would sell a DH+ product which Mr. Angus claimed infringed his product. He counseled Mr. Jack on many occasions to focus on selling non-DH+ products because DH+ was a red flag to a bull, the bull being Mr. Angus.

[369] Mr. Marsh gave advice to Mr. Jack about renaming and relaunching the GW1000 as the GW1100. In his view, this was not “offside” if the new product was better than the old one and, in any event, he believed the GW1000 was an independent design. Mr. Marsh acknowledged that he commented on court proceedings but observed that his advice, which included writing directly to the Canadian judge hearing the case, was not particularly helpful.

[370] Mr. Marsh said he had no direct communication with Mr. Ingraham, Mr. Crawford or Mr. Bunker at any time relevant to the plaintiffs’ conspiracy pleadings. He was on the receiving end of emails involving those individuals, generated by Mr. Jack, who I find appears to have favoured inclusivity in his email threads. Mr. Marsh agreed that he encouraged Mr. Jack to have Igor and Alex Cheifot build a new product and he copied them on that particular email because they were technological experts who could develop something. Significantly, the new product would not be DH+ focussed, consistent with Mr. Marsh’s expressed fear of crossing Mr. Angus.

[371] In 2014, Mr. Marsh’s wife persuaded him to stop communicating with Mr. Jack and he complied. Prior to that he asked the Cheifots to destroy their communications with him because of his fear of repercussions if Mr. Angus detected his involvement.

[372] I accept that Mr. Marsh had no knowledge of and nothing to do with the development of the GW1000. It was a DH+ product and he knew Mr. Angus would be angry over the competition. Mr. Marsh had been in litigation with Mr. Angus before and wanted to avoid repeating the experience.

[373] There is no evidence in the numerous emails between Mr. Jack, Mr. Crawford and Mr. Ingraham between 2005 and 2011 that Mr. Marsh had any stake in the GW1000 or Datalink or any knowledge of the development of the GW1000 or how it was to be marketed. Mr. Marsh was drawn into this litigation because he decided to give a friend some advice, not because he had decided to covertly enter the fray against Mr. Angus as part of a conspiracy in exchange for a piece of Datalink’s financial gain. I am not satisfied he was part of an agreement directed at the

common goal of gaining profits at the expense of Equustek through unlawful acts and I dismiss the plaintiffs' claims against him.

Relief sought

Trademarks

[374] The plaintiffs seek a declaration that they are the owners of the following trademarks and registered trademarks:

- a. EQ7000/DL7000;
- b. EQ7000/DL7000;
- c. EQ-DCM;
- d. DL6000;
- e. DL4500;
- f. DL4000;
- g. DL3500;
- h. DL2000;
- i. DLPCle;
- j. DLPCI;
- k. DL-PC;
- l. DL-STD; and
- m. DL-PC/104;

[375] The defendants made no submissions on this relief and the declaration is granted.

Damages

[376] The plaintiffs seek damages for conspiracy, breach of confidence, passing off, violations of the *Trade-Marks Act*, violations of the *Copyright Act*, breach of the distribution agreement and unjust enrichment.

Quantum of Damages

[377] The plaintiffs must prove a loss on a balance of probabilities. This is a complicated exercise in this case, as none of the defendants who are liable has produced any documentation concerning the profits made by Datalink at the expense of Equustek. Complications aside, damages must be assessed.

[378] In *XY, LLC v. Canadian Topsires*, 2016 BCSC 1095, Fitzpatrick J. summarized the law in this area:

[285] The overall objective in assessing damages (or profits) in intellectual property cases is to find a broadly equitable result. It “must always be more or less a matter of estimate, because it is impossible to ascertain, with arithmetical precision, what, in the ordinary course of business, would have been the amount of the [plaintiffs’] sales and profits”: see *Cadbury Schweppes Inc.* at para. 99, citing *United Horse-Shoe and Nail Co. v. Stewart* (1888), 13 App. Cas. 401 (H.L.). The tribunal must do “the best it can”: *Cadbury Schweppes Inc.* at para. 99, citing *Wood v. Grand Valley Railway Co.* (1915), 51 S.C.R. 283 at 289.

[286] If a plaintiff establishes that a loss has been suffered, the difficulty of determining the amount does not excuse the wrongdoer from paying damages or disgorging its profits. Damages are to be assessed by the court, not calculated, based on facts that were within the plaintiff’s power to prove, and upon which the court may make a fair and reasonable estimate of damages: *Encorp Pacific (Canada) v. Rocky Mountain Return Center Ltd.*, 2008 BCSC 779 at paras. 129-130.

[379] The plaintiffs seek damages based on either the defendants’ likely gain in profits as a result of their actions or Equustek’s profits lost as a result of the defendants’ actions. I have determined that basing damages on Equustek’s lost profits is more accurate and have adopted that method of analysis, although the plaintiffs’ calculations of Datalink’s gain in profits at the expense of Equustek result in very similar numbers.

[380] Mr. Veinotte, counsel for Mr. Ingraham, advanced the submission that damages should be assessed on the basis that it would have taken Datalink two years to legitimately develop the GW1000 (the “springboard” approach) and thus Equustek’s damages should be limited to a period of approximately 25 months, citing *Cadbury Schweppes* at paras. 94-116. The flaw in that submission is that Mr. Jack and the other defendants are liable for more than simply using confidential

information to develop the GW1000 – they engaged in passing off and other behaviour to promote the GW1000 at the expense of Equustek products. The harm done is broader than the breach of confidence.

Equustek's losses to the date of trial

[381] In the three years before 2008 when the GW1000 was launched, Equustek's sales were: \$672,027 CAD (2005); \$643,286 (2006); and \$701,429 (2007). The average for this three-year period was \$672,247 CAD/\$584,900 USD. Mr. Mackay's report refers to both Canadian and US currency, with historic exchange rates provided for guidance.

[382] Commencing in 2008, sales declined to \$483,907 CAD; \$361,236 (2009); \$272,025 (2010); \$290,999 (2011); \$270,642 (2012); \$283,339 (2013); \$340,570 (2014 – the Google injunction was issued in June of this year); \$463,922 (2015); \$583,961 (2016); \$437,780 (2017). The average annual sales from 2008 through the end of 2017 was \$378,838. This represents approximately \$300,000 per year less than the three-year period before the GW1000 was launched, for a total loss of \$2.7 million CAD.

[383] The defendants maintain that some of the lost sales must be attributed to the economic downturn in 2008, relying on their expert, Mr. Patton. The plaintiffs point out, however, that Mr. Mackay's opinion was that Equustek's sales began to lag before the downturn registered and then did not bounce back as other sectors did. I accept Mr. Mackay's evidence on this point.

[384] Mr. Mackay also testified that the market for protocol converters is a relatively steady one, as they are necessary to industrial processing of all types, relatively inexpensive compared to other costs involved in production of goods, and relatively long-lasting and durable. Mr. Angus said he would expect an Equustek protocol converter to have about a 15-year life span.

[385] Compendiously, the plaintiffs have satisfied me that the 2008 economic downturn did not have much, if any, impact on the market for protocol converters and due to the timing of its onset, could not have accounted for the loss of sales.

[386] The plaintiffs' economist, Mr. Mackay, analyzed Equustek's sales figures noted above as well as embedded items such as variable costs (which Equustek would have incurred in order to "earn" the loss of sales, such as parts, supplies, components and such) and estimated that Equustek saved between \$457,000 and \$554,000 CAD between the end of fiscal 2008 and April 3, 2018, the start of the trial. Mr. Mackay looked, as well, at savings in fixed costs (office supplies, travel and promotion and the salary for an engineer) and estimated that Equustek's savings were approximately \$627,000 CAD from the end of fiscal 2008 through the start of the trial.

[387] In Mr. Mackay's opinion, Equustek's lost income from the end of fiscal 2008 to the start of the trial ranged between \$1,826,000 and \$2,346,000 USD. The low range was premised on sales continuing at the three-year average for 2005 through 2007 or \$584,900 USD. The high range was premised on annual sales of \$637,315 USD, the actual sales achieved during fiscal 2007, the year immediately preceding the GW1000 launch. Mr. Mackay noted that Google began to comply with the order to block Datalink websites in September 2014, after which Equustek's sales partially recovered but remained below the \$584,900 USD average.

[388] Mr. Veinotte, counsel for Mr. Ingraham, maintained that the plaintiffs should not receive monetary damages in addition to the injunction they obtained against Mr. Jack and the Datalink defendants on December 13, 2012 (the order of Tindale J.) or the Google order of Fenlon J. on July 6, 2014, since the wrongs alleged have been remedied by injunctive relief.

[389] If the defendants had in fact obeyed the injunctions and the non-participating defendants had participated in this trial, this argument would have significant appeal; however, I am satisfied that the plaintiffs have shown that Mr. Jack and Datalink were able to work around the injunctions and continue to sell the GW1000 for a time.

That said, Google obeyed the order and as a result I am persuaded that Datalink's sales must have been slowly, but surely, curtailed. Datalink relied almost exclusively on the internet to market its GW1000 line of products. The failing health of that avenue of sales is consistent with Mr. Jack's protestations to Mr. Marsh and others, after he abandoned the litigation, that he had limited funds. It is also consistent with Mr. Jack failing to satisfy the bills of his parts supplier, Foreseasons.

[390] Another variable at play that may have affected Equustek's sales prior to trial is the fact that Mr. Angus was consumed with the litigation, rather than innovation, and Equustek did not branch out with new products. Equustek had an engineer on staff for part of this time, Mr. Erickson, but his role appears to have been to keep producing the same products as before the litigation began.

[391] Similarly, there is no evidence Equustek launched an aggressive internet campaign to sell its products to counteract Datalink's internet presence, with the exception of Mr. Angus's "rudy2" website where he criticized the rival product as well as some of the defendants in this case.

[392] Taking into account Mr. Mackay's estimates, factoring in the contingencies that Equustek did not innovate or change the way it marketed its products in the pre-trial period, and placing more significance on the effect of the injunction than Mr. Mackay did, I have assessed Equustek's loss of sales prior to trial at \$1 million CAD. Mr. Crawford, Mr. Jack, the Datalink defendants and the Cheifots are jointly and severally liable for Equustek's loss of past sales.

Equustek's future losses

[393] Mr. Mackay presented three scenarios of future losses: Scenario 1 assumes that Google will continue to block the Datalink website; Scenario 2 assumes that Google will stop blocking the Datalink defendants' websites and Equustek's sales will fall back to the level they were at in the 2014 fiscal year; and Scenario 3 assumes that Equustek's actual sales fall back to the mid-point between expected sales in future loss Scenarios 1 and 2.

[394] All three scenarios were based on the plaintiffs' instruction to assume that Equustek's present product line is expected to continue to have value in the marketplace for 15 years into the future. No rationale was offered by the plaintiffs for the 15-year figure.

[395] Mr. Mackay applied a 20% discount rate to the projected future earnings, rather than the 2% prescribed by the *Law and Equity Act*, R.S.B.C. c. 253, to take into account the risks inherent in the North American economy that affect all business enterprises to one degree or another; company specific risks such as management and financial issues; and specific risks to the industries Equustek serves such as competition for its products or the risk that a competitor designs a more sophisticated product altogether.

[396] In addition to damages for loss of future sales, the plaintiffs seek injunctive relief against the defendants, restraining them from:

- a) using the plaintiffs' trademarks and free-riding on the goodwill of any Equustek products on any website;
- b) making statements disparaging or in any way referring to the Equustek products;
- c) distributing the offending manuals and displaying images of the Plaintiff's products on any website; and
- d) selling the Datalink Products which were created by the theft of the plaintiffs' trade secrets;

and obliging them to:

- e) immediately disclose all hidden websites;
- f) display a page on all websites correcting their misrepresentations about the source and continuing availability of the Equustek products and directing customers to Equustek;

[397] The Google order is still in effect. Prior to the commencement of the trial, Google applied to set aside or vary the injunction issued by Fenlon J. in 2014. Smith J. dismissed the application: 2018 BCSC 610.

[398] The plaintiffs have not addressed the availability in law of the combination of permanent injunctive relief and monetary damages for future losses. I agree with Mr. Veinotte's submission that to assess the plaintiffs' damages as they were presented to the Court through Mr. Mackay's report, and continue to maintain injunctive relief and make the other orders sought by the plaintiffs, including unjust enrichment, an accounting and disgorgement, a declaration of constructive trust and piercing the corporate veil, may well amount to double recovery for the plaintiffs.

[399] The plaintiffs' claim for damages for future losses and/or injunctive relief, shall be determined at a post-judgment hearing. The existing injunctions remain in full force and effect until such time as they are amended or terminated by this Court.

Unjust enrichment, Accounting and disgorgement, Declaration of constructive trust and Piercing the corporate veil

[400] The plaintiffs are entitled to orders concerning unjust enrichment, accounting and disgorgement, a declaration of constructive trust and piercing the corporate veil against Mr. Jack, the Datalink defendants and the Cheifots. The terms of the orders may be settled at a post-judgment hearing.

[401] My understanding of the plaintiffs' position is that these orders should go against individuals with an interest in the Datalink defendants. I am not satisfied Mr. Crawford has such an interest and the plaintiffs' claim for relief against him in this regard is dismissed.

Punitive damages

[402] The plaintiffs are entitled to punitive damages against the non-participating defendants. Their response to the litigation and their conduct in abandoning it constitutes malicious, oppressive or high-handed behaviour: *Smithies Holdings Inc. v. RCV Holdings Ltd.*, 2017 BCCA 177 at para. 131. The amount shall be determined at a post-judgment hearing, once the issue of damages for future losses is ascertained.

[403] The claim for punitive damages against Mr. Crawford is dismissed. While Mr. Crawford's conduct in pre-trial proceedings was dilatory and in many respects unsatisfactory, I am not satisfied it meets the test in *Smithies Holdings Inc.*

Costs

[404] As the successful parties, Mr. Marsh, Mr. Ingraham and Mr. Bunker are entitled to their costs at Scale B. If there are matters of which I am unaware that affect the issue of costs, the parties must file a request for a hearing within 30 days of the release of these reasons.

[405] The plaintiffs are entitled to costs against the non-participating defendants, Morgan Jack, the Datalink defendants and the Cheifots on a scale to be determined.

[406] The plaintiffs had mixed success against Mr. Crawford. The issue of costs will need to be scheduled for determination.

Interest

[407] The plaintiffs are entitled to interest on their award for past losses pursuant to the *Court Order Interest Act*.

"Duncan J."

The Honourable Madam Justice Duncan

Appendix A

Assembler – a language-processor computer program designed to translate symbolic assembly language into equivalent machine language.

Assembly language – a computer language. Assembly language is regarded as “low level” programming language, the closest one to machine language. It has largely been superseded by other computer languages, such as C and C+, but is still useful for some programming tasks. It is not human readable. Mr. Angus wrote his source code for Equus and Equustek in Assembly.

Bin file – Mr. Crawford referred to a bin file during his testimony. The definition of bin file was never made entirely clear, but he agreed that it could refer to a file containing source code. Bin is short for binary, which is exemplified by the use of the numbers “1” and “0” for programming purposes.

BOM – Bill of Materials, also known as a Parts list. There was general agreement that a BOM was a confidential document.

Bus – a collection of parallel communication wires which carry information in each wire that is significantly related to the information in the other wires. All the information on a bus operates in unison as a coordinated group of data.

Circuit board – a sheet of insulating material used for mounting and interconnection of components in electronic equipment. Circuit boards have artwork on them, which depicts the placement of electronic components to implements the wiring connections shown in a schematic.

C-language – a high-level human readable computer language, most of whose expressions easily convey the meaning of their operation to a human with some familiarity with the language. Mr. Crawford wrote the QPAB and Datalink source code for the GW1000 in C-language.

Compiler – a language processor computer program that translates source code written in a high level language, like C, into another language, such as machine. The compiling process strips out most human readable elements.

CPU – the Central Processing Unit of a computer system which contains hardware necessary to interpret and execute program instructions.

Daughterboard - a small printed circuit board designed to work with a larger one.

DF1 Port – the serial communications port used to connect to an Allen-Bradley (or equivalent) device, which provides a portal for connecting to the DH+ Bus via the DF1 Port.

DH+ Bus – the Allen-Bradley proprietary communications bus for connecting Allen-Bradley products together so they can “talk” to each other over the bus.

Diode – a semiconductor device that allows electrical current to pass in one direction.

Firmware – a microprogram stored in Read Only Memory (ROM), not easily modified because it is stored in a fixed memory system. It cannot be seen or touched, like hardware, or easily modified, like source code.

Interface – something that enables separate and sometimes incompatible elements to coordinate effectively, such as a transformer.

Machine code/language – the instructions for the processing of data that can be understood and executed by a computer.

MPE – an abbreviation for Manchester Phase Encoding. It is a system of encoding binary bits into a complex waveform with an embedded clock, used for communicating information from one device to another without a requirement for synchronized clocks at each device, because it is “self-clocking”, and which may act as a transformer between devices. It is a type of PLD.

Node – one device on a network of devices.

NRE – non-recoverable engineering costs generally incurred at the start-up phase of a project.

PLD – programmable logic device, a semiconductor device designed to be programmed to implement various external logic function devices into one chip, saving space and improving performance.

Schematic – a diagram, plan or drawing which represents the wiring connections between various components in a hardware system; the diagrammatic representation of a circuit.

Source code – computer program instructions written by a programmer that must be translated by a compiler, interpreter or assembler into object code before a computer can execute the commands.

Transformer – a device that transforms input signals into output signals. Used as a coupling device over a limited frequency range.

Vapourware – non-existent wares that are advertised on the internet as if they exist in order to gauge the market for them.

Appendix B

- EQ7000/DL7000 - Ethernet/IP, AB Ethernet, and DH+
- EQ7000/DL7000 - Ethernet/IP, AB Ethernet, and DH-485

- EQ-DCM - AB Ethernet, DF1, and ASCII
- EQ-DCM - AB Ethernet, Modbus RTU/ASCII
- EQ-DCM - Ethernet/IP, AB Ethernet, DF1, ASCII (custom)

- DL6000 - Modbus TCP to DH+
- DL6000 - Modbus TCP to DH-485

- DL4500 - Ethernet Encapsulated DF1 to DH+ (Multi-Master)
- DL4500 - Ethernet Encapsulated DF1 to DH+ (Standard Tunnel)
- DL4500 - Ethernet Encapsulated DF1 to DH-485 (Multi-Master)
- DL4500 - Ethernet Encapsulated DF1 to DH-485 (Standard Tunnel)

- DL4000
 - DFX(3DF1 connections), DMX(ModBus to DF1), MMX(ModBus RTU to ModBus ASCII)
 - DAS(DF1 to ASCII), MAS(ASCII Floating Point to ModBus RTU Slave)
 - PM(DF1 Half Duplex Master to AB Power Monitor 3000)

- DL3500
 - DF1 to DH+, DF1 to DH-485, DF1 to DH+/DH-485 Combination
 - Modbus RTU/ASCII to DH+, Modbus RTU/ASCII to DH-485
 - ASCII to DH+, ASCII to DH-485 & DH+ to DH+ Bridging

- DL2000
 - KFX – (DF1 to DH+), CMX – (Modbus RTU/ASCII to DH+), K2F – (2 DF1 to DH+)
 - KFR – (Remote/IO to DH+), ASC – (ASCII Scanner to DH+), ASM – (ASCII Monitor to DH+)
 - SCIPU – (Siemens to DH+), INV2 – (Toshiba to DH+)

- DLPCle - DF1 to DH+ OR DF1 to DH-485
- DLPCI - DF1 to DH+ OR DF1 to DH-485
- DL-PC - DF1 to DH+ OR DF1 to Remote/IO
- DL-STD - DF1 to DH+
- DL-PC/104 - DF1 to DH+ OR DF1 to Remote/IO

Appendix C

DL3500 User's Guide Revision 1.04	GW1000 User's Guide Revision 1.04
<p data-bbox="302 401 748 470">1.0 DL3500 General Operation & Applications</p> <p data-bbox="302 506 808 1056"><u>The DL3500 continues the functionality of the current DL2000/DL3000 product line. It offers both the new addition of DH-485 as well as plug and play USB interface. As well as having the DH+ and 232/422/485 capabilities of the DL3000. The fully populated DL3500 Model will also allow Bridging between DH+ and DH485 networks in one unit. New is the ability to power the DL3500 from the USB communication link, removing the sometimes cumbersome procedure of location of AC or DC power supply when using laptops or PC's in the field.</u></p> <p data-bbox="302 1094 808 1457"><u>The DL3500 has two communication ports. Channel A is designed to connect to your industrial network, either A-B's DH+ or DH-485 networks. Channel B is used to connect to your serial or USB device, the protocol depends on which flavor (model) of the DL3500 you have ordered. Channel B has the capabilities of RS232C, RS422, RS485 and USB 2.0.</u></p> <p data-bbox="302 1495 792 1675"><u>Configuration of the operating parameters is done quickly and easily by the DL32 V3.X windows based software shipped with the unit or available on the Equustek Website.</u></p> <p data-bbox="302 1780 756 1885"><u>Currently there are three standard DL3500 products available to allow access to A-B's' DH-485 and DH+</u></p>	<p data-bbox="837 401 1295 470">1.0 GW1000 General Operation & Applications</p> <p data-bbox="837 506 1369 947"><u>The GW1000 continues the functionality of the current DL2000/DL3000/DL3500 product line. In addition to having connectivity to Allen-Bradley's DH+, and the RS232/422/485/USB capabilities of the DL3500, the GW1000 offers a 10/100 Base-T Ethernet connection. The ability to power the GW1000 from the USB communication link is also present, removing the sometimes cumbersome procedure of locating a DC power supply when using laptops or PC's in the field.</u></p> <p data-bbox="837 1119 1369 1451"><u>The GW1000 has two communications ports. Channel A is designed to connect to your industrial Allen-Bradley DH+ network. Channel B is used to connect to your serial or USB device, the protocol depends on which model of the GW1000 you have ordered. Channel B has the capabilities of RS232C, RS422, RS485 and USB 2.0.</u></p> <p data-bbox="837 1488 1369 1740"><u>Configuration of the operating parameters is done quickly and easily via the Ethernet interface. Operational Firmware is also easily upgraded over the Ethernet interface. This allows for quick changes if you need to change your protocol.</u></p> <p data-bbox="837 1780 1352 1885"><u>Currently there are three standard GW1000 products available to allow access to Allen-Bradley's DH+ network.</u></p>

<p><u>network. Many other custom ASCII and serial protocols have been implemented to both DH+ and DH-485 on the DL3500 platform.</u></p> <p><u>Contact Equustek Solutions to see if the DL3500 is the correct device for your communication needs.</u></p>	<p><u>Many other custom ASCII and serial protocols have been implemented on DH+ on the GW1000 platform.</u></p> <p><u>Contact DataLink Technologies to see if the GW1000 is the correct device for your communication needs.</u></p>
<p><u>2.1 Operating Specifications</u></p> <p><u>CHA can be configured for DH-485 at 4800, 9600 or 19.2 Kbaud, or DH+ of 57.6, 115.2 and 230.4 Kbaud</u></p> <p><u>CHB has full RS232C, as well as both RS422 4 wire and RS485 2 wire modes. CHB has the ability of being configured with asynchronous speeds up to 230.4 Kbaud as well as the new Plug and Play Windows USB Interface (Version 2.0 implemented on newer models, Please advise Equustek if important).</u></p> <p><u>Currently DF1, Modbus, and ASCII are the supported protocols. Custom ones are easily implemented. Both CRC 16 and BCC error checking can be implemented; custom error checking can be added at the customer's request.</u></p> <p><u>Simple Parameter Configuration using menu driven Windows (95/98/ME/XP/NT/2000) based Program via RS232 Cable or USB Interface.</u></p> <p><u>Configuration and Reset Pushbuttons to setup online configuration parameters and do a full Hardware Reset.</u></p> <p><u>Operating Parameters are stored in Non-Volatile Serial EEPROM.</u></p>	<p><u>2.1 Operating Specifications</u></p> <p><u>CHA can be configured DH+ with baud rates of 57.6, 115.2 and 230.4 Kbaud.</u></p> <p><u>CHB has full RS232C, as well as both RS422-4 wire and RS485 2-wire modes. CHB has the ability of being configured with asynchronous speeds up to 230.4 Kbaud as well as the new Plug and Play Windows USB Interface.</u></p> <p><u>Currently DF1, Modbus, and ASCII are the supported protocols. Custom protocols are easily implemented. Both CRC 16 and BCC error checking can be implemented; custom error checking can be added at the customer's request.</u></p> <p><u>Simple Parameter Configuration using Ethernet interface.</u></p> <p><u>Configuration and Reset Pushbuttons to set up online configuration parameters and perform a full Hardware Reset as well as a Restore to Factory Defaults option.</u></p> <p><u>Operating Parameters are stored in non-volatile flash memory. The GW1000</u></p>

<p>The DL3500 uses FLASH upgradeable firmware from the configuration software.</p> <p><u>Bi-Color (Green/Red) LED's for each communication channel indicates activity and status. Green POWER LED indicates power on.</u></p>	<p>firmware can be upgraded via the Ethernet interface.</p> <p><u>Bi-color (Green/Red) LED's for each communication channel indicates activity and status. Green POWER LED indicates power on.</u></p>
<p>DL3500-DH+/Modbus Communication Controller Application Note</p> <p>Ex 20, First Tab 2</p>	<p>DataLink DL-GW-1000DHPM Modbus to DH+</p> <p>Ex 20, Last Tab 3</p>
<p><u>The DL3500 model contains two modes of operation, Modbus Master and Modbus Slave, which are selectable by the PC Configuration Software</u></p>	<p><u>The DL-GW-1000 DHPM model contains two modes of operation, Modbus Master and Modbus Slave, which are selectable by the web screens as per below.</u></p>
<p><u>Master or Slave mode?</u></p> <p>This application note is divided into two parts, Modbus Master and Modbus Slave modes; <u>they correspond to the mode the DL3500 is going to be on the Modbus Network, and which side either DH+ or Modbus the commands will be initiated on.</u></p> <p><u>Master mode</u> is used when a device on the DH+ network is going to initiate all communications with one or many Modbus slave devices. Please refer to DL3500-DH+/Modbus Master Application note.</p> <p><u>Slave mode</u> is used when a device on the Modbus network is going to initiate all communications with one or many SLC's, PLC's or other DH+ devices. Please refer to DL3500-DH+/Modbus</p>	<p><u>Master or Slave mode?</u></p> <p>The DL-GW 1000-DHPM can be configured into either Modbus Master or Modbus Slave modes. <u>They correspond to the mode the DL-GW1000 is going to be on the Modbus Network, and which side DH+ or Modbus the commands will be initiated on.</u></p> <p><u>Master mode</u> is used when a device on the DH+ network is going to initiate all communication with one or many Modbus slave devices.</p> <p><u>Slave mode</u> is used when a Master device on Modbus network is going to initiate all communications with one or many SLC's, PLC's or other DH+ devices.</p>

<p>Slave Application Note.</p> <p><u>The application notes generally assume that a SLC or other DH+ device which can originate commands to Modbus via a DL3500 in master mode, or responding to Modbus commands via a DL3500 in slave mode. Only devices capable of transmitting DH+ message commands in PLC5 (or PLC3) format are able to receive DH+ message commands in PLC5 format can be used with the DL3500-Modbus/DH+ including SCL's, MicroLogix's, ControlLogix's and HMIs as well as other intelligent devices.</u></p> <p><u>Due to differences between DH+ and Modbus protocols and the universal design of the DL3500 there are differences between the lengths of messages, error handling and addressing which have to be carefully considered by the Systems Designer, Programmer and Installer.</u></p>	<p><u>The application notes generally assume that a PLC, SLC or other DH+ device can originate commands to Modbus via a DL-GW1000 in master mode, or responding to Modbus commands via a DL-GW1000 in slave mode. Only devices capable of transmitting DH+ message commands in PLC5 (or PLC3) format are able to receive DH+ message commands can be used with the DL-GW1000-DHPM including SLC's, MicroLogix's, ControlLogix's, HMIs and other intelligent devices.</u></p> <p><u>Due to differences between DH+ and Modbus protocols and the universal design of the DL-GW1000 there are differences between the lengths of messages, error handling and addressing which have to be carefully considered by the Systems Designer, Programmer and Installer.</u></p>
<p><u>Notes:</u></p> <ol style="list-style-type: none"> <u>1. The unit that you have received can be configured as Modbus Master or Modbus Slave. Ensure that you understand and carefully follow the specific configuration procedures for the Modbus protocol.</u> <u>2. There are significant differences between the configuration, programming and operational requirements of the Modbus Master and Modbus Slave protocols.</u> <u>3. If you configure the DL3500 for Modbus Master Operation it</u> 	<p><u>Notes:</u></p> <ol style="list-style-type: none"> <u>1. The unit that you have received can be configured as Modbus Master or Modbus Slave device. Ensure that you understand and carefully follow the specific configuration procedures for the different modes of operation.</u> <u>2. There are significant differences between the configuration, programming and operational requirements of the Modbus Master and Modbus Slave protocols.</u> <u>3. If you configure the DL-GW1000 for Modbus Master Operation it</u>

must be the only master on the Modbus network. A station on DH+ originates commands to the DL3500-DH+ Modbus Master that then re-transmits them over Modbus to a Modbus Slave device. Other intelligent DH+ devices capable of initiating DH+ messages in PLC5 (or PLC3) format and able to receive PLC5 message commands could also be used as the DH+ "master".

4. Be sure to fully test the hardware and software off-line to ensure that you understand its configuration and operation. Prior to putting the DL3500 on-line in a production process, the operation of the complete system should be fully tested on-line in a safe "test" environment.
5. Due to differences between DH+ and Modbus hardware and software, there are differences between the lengths of messages, error handling and addressing which have to be carefully considered by the Systems Designer, Programmer and Installer.
6. Additional literature regarding DH+, Modbus and PLC products can be obtained from Modicon and A-B. Suggested reference materials for A-B DH+ protocol is shown in section 1.7 of the User's Guide.

must be the only master on the Modbus network. A station on DH+ originates commands to the DL-GW1000 and then the Modbus Master request is formatted and transmitted over Modbus to a Modbus Slave device. Other intelligent DH+ devices capable of initiating DH+ messages in PLC5 (or PLC3) format and able to receive PLC5 message commands could also be used as the DH+ "master".

4. Be sure to fully test the hardware and software off-line to ensure that you understand its configuration and operation. Prior to putting the DL-GW1000 on-line in a production process, the operation of the complete system should be fully tested on-line in a safe "test" environment.
5. Due to differences between DH+ and Modbus protocols there are differences between the lengths of messages, error handling and addressing which have to be carefully considered by the Systems Designer, Programmer and Installer.
6. Additional literature regarding DH+, Modbus and PLC products can be obtained from Modicon and A-B.