

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT2820204

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY AGREEMENT
CONVEYING PARTY DATA	
Name	Execution Date
METER READINGS HOLDING, LLC	04/18/2014
ACLARA TECHNOLOGIES LLC	04/18/2014
ACLARA INTERNATIONAL LLC	04/18/2014
RECEIVING PARTY DATA	
Name:	PNC BANK, NATIONAL ASSOCIATION
Street Address:	500 FIRST AVENUE
City:	PITTSBURGH
State/Country:	PENNSYLVANIA
Postal Code:	15219
PROPERTY NUMBERS Total: 107	
Property Type	Number
Application Number:	12731825
Application Number:	61164049
Patent Number:	8040251
Patent Number:	8456285
Application Number:	60837354
Patent Number:	7831884
Application Number:	60837349
Application Number:	60780152
Patent Number:	7496430
Patent Number:	7432823
Patent Number:	6940396
Patent Number:	7180517
Patent Number:	4658238
Patent Number:	4918422
Patent Number:	4998102
Patent Number:	4963853
Patent Number:	4996513
Patent Number:	5262755
Patent Number:	5198796

PATENT

Property Type	Number
Patent Number:	5486805
Patent Number:	5310075
Patent Number:	5696441
Patent Number:	5933072
Application Number:	12596987
Patent Number:	8401093
Patent Number:	8433452
Patent Number:	4218655
Patent Number:	4400688
Application Number:	61562787
Application Number:	61559794
Application Number:	13669773
Application Number:	08743162
Patent Number:	7312693
Patent Number:	7130722
Patent Number:	7227462
Patent Number:	4795892
Patent Number:	5146067
Patent Number:	6314378
Patent Number:	7523375
Patent Number:	5986574
Patent Number:	6239722
Patent Number:	6509841
Patent Number:	7733245
Patent Number:	8401039
Application Number:	61182483
Application Number:	12026951
Application Number:	61447365
Application Number:	13407265
Application Number:	12692919
Application Number:	61386720
Application Number:	13233173
Application Number:	61373589
Application Number:	13205355
Application Number:	61373586
Application Number:	13816386
Application Number:	61442956
Application Number:	13988461
Application Number:	12020763

Property Type	Number
Application Number:	61437094
Application Number:	13347242
Application Number:	12105258
Application Number:	13407595
Application Number:	61885296
Application Number:	61837443
Patent Number:	5617084
Patent Number:	5719564
Patent Number:	6072405
Patent Number:	8441372
Application Number:	12832332
Application Number:	61264625
Application Number:	13511405
Application Number:	13512095
Application Number:	14156765
Patent Number:	8126665
Application Number:	60556619
Application Number:	11092287
Application Number:	61788957
Patent Number:	5903231
Patent Number:	6122010
PCT Number:	US2010028592
PCT Number:	US2007075547
PCT Number:	US2007063393
PCT Number:	US2006043084
PCT Number:	US9209003
PCT Number:	US9209001
PCT Number:	US9304922
PCT Number:	US2008060731
PCT Number:	US2009054482
PCT Number:	US2006033471
PCT Number:	US2011022221
PCT Number:	US2011051915
PCT Number:	US2011045740
PCT Number:	US1147525
PCT Number:	US2011062510
PCT Number:	US2010057245
PCT Number:	US2010057054
PCT Number:	US2008086183

Property Type	Number
PCT Number:	US2007075548
PCT Number:	US2009056638
PCT Number:	US2012065764
PCT Number:	US2012064162
PCT Number:	NZ1995000068
PCT Number:	NZ1996000110
PCT Number:	US1987003241
PCT Number:	US1991000271
PCT Number:	NZ1997000043
PCT Number:	US1998020379

CORRESPONDENCE DATA

Fax Number: (215)832-5619

Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent via US Mail.

Phone: 215-569-5619

Email: pecsenye@blankrome.com

Correspondent Name: TIMOTHY D. PECSENYE

Address Line 1: ONE LOGAN SQUARE

Address Line 2: 8TH FLOOR

Address Line 4: PHILADELPHIA, PENNSYLVANIA 19103-6998

ATTORNEY DOCKET NUMBER:	074658-14002
NAME OF SUBMITTER:	TIMOTHY D. PECSENYE
SIGNATURE:	/Timothy D. Pecsénye/
DATE SIGNED:	04/18/2014
	This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 28

source=Patent Security Agreement#page1.tif
source=Patent Security Agreement#page2.tif
source=Patent Security Agreement#page3.tif
source=Patent Security Agreement#page4.tif
source=Patent Security Agreement#page5.tif
source=Patent Security Agreement#page6.tif
source=Patent Security Agreement#page7.tif
source=Patent Security Agreement#page8.tif
source=Patent Security Agreement#page9.tif
source=Patent Security Agreement#page10.tif
source=Patent Security Agreement#page11.tif
source=Patent Security Agreement#page12.tif
source=Patent Security Agreement#page13.tif
source=Patent Security Agreement#page14.tif
source=Patent Security Agreement#page15.tif
source=Patent Security Agreement#page16.tif

PATENT

REEL: 032712 FRAME: 0934

source=Patent Security Agreement#page17.tif
source=Patent Security Agreement#page18.tif
source=Patent Security Agreement#page19.tif
source=Patent Security Agreement#page20.tif
source=Patent Security Agreement#page21.tif
source=Patent Security Agreement#page22.tif
source=Patent Security Agreement#page23.tif
source=Patent Security Agreement#page24.tif
source=Patent Security Agreement#page25.tif
source=Patent Security Agreement#page26.tif
source=Patent Security Agreement#page27.tif
source=Patent Security Agreement#page28.tif

PATENT SECURITY AGREEMENT



This Patent Security Agreement (this “**Patent Security Agreement**”) is made as of this 18th day of April, 2014, by the Grantors listed on the signature pages hereof (each a “**Grantor**” and collectively, jointly and severally, the “**Grantors**”), in favor of **PNC BANK, NATIONAL ASSOCIATION**, in its capacity as agent for the Lenders (together with its successors and assigns in such capacity, “**Agent**”).

WHEREAS, pursuant to that certain Revolving Credit, Term Loan and Security Agreement dated as of the date hereof (as amended, restated, supplemented or otherwise modified from time to time, including all exhibits and schedules thereto, the “**Credit Agreement**”) among **METER READINGS HOLDING, LLC**, a Delaware limited liability company (“**Parent Holdco**”), **ACLARA TECHNOLOGIES LLC**, an Ohio limited liability company (“**Aclara**”), **ACLARA INTERNATIONAL LLC**, a Missouri limited liability company (“**Aclara International**” and, together with each Person from time to time joined as a party thereto as a “**Borrower**” in accordance with the terms thereof, and all of their respective permitted successors and assigns, “**Borrowers**” and each a “**Borrower**”), the lenders from time to time party thereto (the “**Lenders**”), and Agent, the Lenders agreed to make certain financial accommodations available to Borrowers from time to time pursuant to the terms and conditions thereof;

WHEREAS, pursuant to the Credit Agreement, the Grantors are required to execute and deliver to Agent, for the benefit of the Lenders, this Patent Security Agreement.

NOW, THEREFORE, in consideration of the premises and mutual covenants herein contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, each Grantor hereby agrees as follows:

1. Defined Terms. All capitalized terms used but not otherwise defined herein have the meanings given to them in the Credit Agreement.

2. Grant of Security Interest in Patent Collateral. Each Grantor hereby grants to Agent, for the benefit of the Lenders, a continuing first priority (subject to Permitted Encumbrances) security interest in all of such Grantor’s right, title and interest in, to and under the following, whether presently existing or hereafter created or acquired (collectively, the “**Patent Collateral**”):

(a) all of such Grantor’s patents, patent applications, patentable inventions, trade secrets, equipment formulations, manufacturing procedures, quality control procedures (collectively, “**Patents**”), and licenses for any of the foregoing (“**Licenses**”), including those U.S. patents and U.S. published patent applications referred to on **Schedule I** hereto;

(b) all reissues, continuations, continuations-in-part, substitutes, extensions or renewals of and improvements on the foregoing; and

(c) all products and proceeds of the foregoing, including any claim by such Grantor against third parties for past, present or future infringement or dilution of any Patent or any Patent licensed under any License;

provided however that the term "Patent Collateral" shall be subject in all respects to the provisos set forth at the end of the definition of "Collateral" in the Credit Agreement and shall therefore not include any of the assets, property, agreements, license, interests or rights as set forth therein.

3. Security For Obligations. This Patent Security Agreement and the security interest created hereby secure the payment and performance of all the Obligations, whether now existing or arising hereafter. Without limiting the generality of the foregoing, this Patent Security Agreement secures the payment of all amounts which constitute part of the Obligations and would be owed by Grantors, or any of them, to Agent, the Lenders or any of them, whether or not they are unenforceable or not allowable due to the existence of an insolvency proceeding involving any Grantor.

4. Credit Agreement. The security interests granted pursuant to this Patent Security Agreement are granted in conjunction with the security interests granted to Agent, for the benefit of the Lenders, pursuant to the Credit Agreement. Each Grantor hereby acknowledges and affirms that the rights and remedies of Agent with respect to the security interest in the Patent Collateral made and granted hereby are more fully set forth in the Credit Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein.

5. Authorization to Supplement. If any Grantor shall obtain rights to any new Patents or Licenses for Patents, this Patent Security Agreement shall automatically apply thereto. Each Grantor shall give prompt notice in writing to Agent with respect to any such new Patent or Licenses for Patents. Without limiting any Grantor's obligations under this Section 5, each Grantor hereby authorizes Agent unilaterally to modify this Patent Security Agreement by amending **Schedule I** to include any such new U.S. patents (to the extent provided in the Credit Agreement), U.S. published patent applications or Licenses (to the extent provided in the Credit Agreement) for Patents of such Grantor. Notwithstanding the foregoing, no failure to so modify this Patent Security Agreement or amend **Schedule I** shall in any way affect, invalidate or detract from Agent's continuing security interest in all Collateral, whether or not listed on **Schedule I**.

6. Counterparts. This Patent Security Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all such separate counterparts shall together constitute but one and the same instrument. In proving this Patent Security Agreement or any Other Document in any judicial proceedings, it shall not be necessary to produce or account for more than one such counterpart signed by the party against whom such enforcement is sought. Any signatures delivered by a party by facsimile transmission or by e-mail transmission shall be deemed an original signature hereto.

7. Construction. Unless the context of this Patent Security Agreement or any Other Document clearly requires otherwise, references to the plural include the singular, references to the singular include the plural, the terms "includes" and "including" are not limiting, and the term "or" has, except where otherwise indicated, the inclusive meaning represented by the phrase

“and/or.” The words “hereof,” “herein,” “hereby,” “hereunder,” and similar terms in this Patent Security Agreement or any Other Document refer to this Patent Security Agreement or such Other Document, as the case may be, as a whole and not to any particular provision of this Patent Security Agreement or such Other Document, as the case may be. Section, subsection, clause, schedule, and exhibit references herein are to this Patent Security Agreement unless otherwise specified. Any reference in this Patent Security Agreement or in any Other Document to any agreement, instrument, or document shall include all alterations, amendments, changes, extensions, modifications, renewals, replacements, substitutions, joinders, and supplements, thereto and thereof, as applicable (subject to any restrictions on such alterations, amendments, changes, extensions, modifications, renewals, replacements, substitutions, joinders, and supplements set forth herein). Any reference herein or in any Other Document to the satisfaction or repayment in full of the Obligations shall mean the repayment in full in cash (or cash collateralization in accordance with the terms of the Credit Agreement) of all Obligations other than unasserted contingent indemnification Obligations. Any reference herein to any Person shall be construed to include such Person’s successors and assigns.

[Remainder of page intentionally left blank; signature pages follow.]

IN WITNESS WHEREOF, Grantor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

GRANTOR:

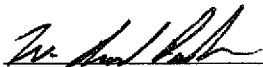
ACLARA TECHNOLOGIES LLC,
an Ohio limited liability company

By: 
Ryne Van Gorp
Chief Financial Officer and Secretary

[Signature Page to Patent Security Agreement]

**ACCEPTED AND
ACKNOWLEDGED BY:**

PNC BANK, NATIONAL ASSOCIATION,
as Agent

By: 

W. Reed Paden
Vice President

[Signature Page to Patent Security Agreement]

PATENT
REEL: 032712 FRAME: 0940

SCHEDULE I
TO
PATENT SECURITY AGREEMENT

Patents

Aclara Technologies LLC Patents and Applications

Docket No.: EP20-00081

Title: Under Frequency/Under Voltage Detection In A Demand Response Unit

Attorney(s): Polster Lieder

Inventor(s): Fleck, Christopher

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	US2010/028592	25-Mar-2010			
United States of America	PRO	Pending	61/164,049	27-Mar-2009		27-Mar-2010	
United States of America	PRI	Published	12/731,825	25-Mar-2010			

Docket No.: EP20-00082

Title: Achieving Energy Demand Response Using Price Signals and Load Control Transponder

Attorney(s): Polster Lieder

Inventor(s): Haynes, David D

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	2008/086183	10-Dec-2008			
United States of America	ORD	Pending	12/809,134	11-Jan-2012			

Note: Response to Office Action at USPTO due March 11, 2014.

Docket No.:	EP20-00083						
Title:	Detection of Fast Poll Responses in a TWACS Inbound						
Attorney(s):	Polster Lieder						
Inventor(s):	Spencer, Quentin						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	US07/0075548	09-Aug-2007	8,040,251 8456285	18-Oct-2011	16-Jun-2030
United States of America	ORD	Granted	11/836,354	09-Aug-2007		04-Jun-2013	22-May-2029
United States of America	PCT	Granted	12/377,177	11-Feb-2009		11-Aug-2007	
United States of America	PRO	Completed	60/837,354	11-Aug-2006			

Docket No.:	EP20-00084						
Title:	Method of Correcting Message Errors Using Cyclic Redundancy Checks						
Attorney(s):	Polster Lieder						
Inventor(s):	Spencer, Quentin						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	US2007/075547	09-Aug-2007	7,831,884	09-Nov-2010	09-Aug-2027
United States of America	ORD	Granted	11/836,381	09-Aug-2007		11-Aug-2007	
United States of America	PRO	Completed	60/837,349	11-Aug-2006			

Docket No.:	EP20-00085						
Title:	Intelligent Fault Detector System and Method						
Attorney(s):	Polster Lieder						
Inventor(s):	Mak, Sioc T						

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	US2007/063393	06-Mar-2007		08-Mar-2007	
United States of America	PRO	Completed	60/780,152	08-Mar-2006	7,496,430	24-Feb-2009	06-Mar-2027
United States of America	PRI	Granted	11/682747	06-Mar-2007			

Docket No.: EP20-00087
Title: Tamper Detection Apparatus For Electrical Meters
Attorney(s): Polster Liedner
Inventor(s): Soni, Devendra K

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	US2006/043084	02-Nov-2006			
United States of America	PRI	Granted	11/270,789	09-Nov-2005	7,432,823	07-Oct-2008	30-Nov-2026

Docket No.: EP20-00090
Title: Concurrent Phase Communication in TWACS
Attorney(s): Polster Liedner
Inventor(s): Hammond, Benjamin A; Hessling, Jr., John B; Lagerstrom, Krister

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	10/430,786	06-May-2003	6,940,396	06-Sep-2005	16-Jan-2024

Docket No.:	EP20-00091								
Title:	Quality of Service Terrain Map for Utilities								
Attorney(s):	Polster Lieder								
Inventor(s):	Haynes, David D								
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date		
United States of America	PRI	Granted	10/645,468	21-Aug-2003	7,180,517	20-Feb-2007	05-Oct-2023		

Docket No.:	EP20-00092								
Title:	Method and Apparatus for Generating Intelligence on a Carrier								
Attorney(s):	Polster Lieder								
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date		
United States of America	PRI	Expired	411,035	24-Aug-1982	4,658,238	14-Apr-1987	14-Apr-2004		

Docket No.:	EP20-00093								
Title:	Method and Apparatus for Extracting Inbound Information Generated Line-to-Line in a Multi-Phase Electric Distribution								
Attorney(s):	Polster Lieder								
Inventor(s):	Mak, Sioc T								
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date		
United States of America	PRI	Granted	07/185,792	25-Apr-1988	4,918,422	17-Apr-1990	25-Apr-2008		

Docket No.: EP20-00095
Title: Integrated Meter Transponder
Attorney(s): Polster Lieder
Inventor(s): Aubuchon, Mark E; Wyler, Craig S

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	07/227,343	02-Aug-1988	4,998,102	05-Mar-1991	02-Aug-2008

Docket No.: EP20-00096
Title: Simultaneous Inbound Multi-Channel Communication System Using Electricity Distribution Network
Attorney(s): Polster Lieder
Inventor(s): Mak, Sioc T

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	07/421,794	16-Oct-1989	4,963,853	16-Oct-1990	16-Oct-2009

Docket No.: EP20-00097
Title: Carrier Stability Erasure Filling System for Communications Over Electricity Distribution Network
Attorney(s): Polster Lieder
Inventor(s): Maginnis, Richard L; Franzen, Kevin J; Mak, Sioc T

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	07/481,247	20-Feb-1990	4,996,513	26-Feb-1991	20-Feb-2010

Docket No.: EP20-00098
Title: Inbound Communications Using Electricity Distribution
Attorney(s): Polster Lieder
Inventor(s): Franzen, Kevin J; Mak, Sioe T

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Completed	US92/09003	27-Oct-1992			
United States of America	PRI	Granted	07/809,588	17-Dec-1991	5,262,755	16-Nov-1993	17-Dec-2011

Docket No.: EP20-00099
Title: Outbound Signal Detector System and Method
Attorney(s): Polster Lieder
Inventor(s): Hessling, Jr., John B

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Completed	US92/09001	26-Oct-1992			
United States of America	PRI	Granted	07/722,134	27-Jun-1991	5,198,796	30-Mar-1993	27-Jun-2011

Docket No.: EP20-00100
Title: Method of Receiving Unsolicited Messages on an Electrical Distribution Network Communications System
Attorney(s): Polster Lieder
Inventor(s): Mak, Sioe T

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	08/086,085	06-Jul-1993	5,486,805	23-Jan-1996	06-Jul-2013

Docket No.: EP20-00101
Title: Waterproof, Gasketless Enclosure
Attorney(s): Polster Lieder

Inventor(s):	Wylter, Craig S
Country	
Patent Cooperation Treaty	ORD
United States of America	PRI
Case Type	
Completed	
Granted	
Application Number	
US93/04922	
07/982,633	
Filing Date	
25-May-1993	
27-Nov-1992	
Patent Number	
5,310,075	
Issue Date	
10-May-1994	
Expiration Date	
27-Nov-2012	

Docket No.:	EP20-00102
Title:	Linear Alternating Current Interface for Electronic Meters
Attorney(s):	Polster Lieder
Inventor(s):	Mak, Sioe T; Ramey, Brian C
Country	
United States of America	PRI
Case Type	
Granted	
Application Number	
08/242,597	
Filing Date	
13-May-1994	
Patent Number	
5,696,441	
Issue Date	
09-Dec-1997	
Expiration Date	
09-Dec-2014	

Docket No.:	EP20-00103
Title:	Current Level Control for TWACS Inbound Communications
Attorney(s):	Polster Lieder
Inventor(s):	Kelly, Dennis L
Country	
United States of America	PRI
Case Type	
Granted	
Application Number	
08/966,447	
Filing Date	
07-Nov-1997	
Patent Number	
5,933,072	
Issue Date	
03-Aug-1999	
Expiration Date	
07-Nov-2017	

Docket No.:	EP20-00113
Title:	Detection of Outbound Message Signals in a Power Line Two-Way Communications System
Attorney(s):	Polster Lieder

Inventor(s): Spencer, Quentin; Hessling, Jr., John B; Hammond, Benjamin A; Kelley, Dennis; Rieken, David; Davis, William J; Walker II, Michael R

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	US2008/060731	18-Apr-2008			
United States of America	ORD	Published	12/596,987	22-Oct-2009			

Docket No.: EP20-00114

Title: A General Method for Low-Frequency Data Transmission on a Power Line

Attorney(s): Polster Lieder

Inventor(s): Spencer, Quentin

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	US2009/054482	20-Aug-2009			
United States of America	ORD	Granted	12/549,472	28-Aug-2009	8,401,093	19-Mar-2013	18-Jan-2032

Docket No.: EP20-00115

Title: Method for Load Control Using Temporal Measurements of Energy for Individual Pieces of Equipment

Attorney(s): Polster Lieder

Inventor(s): Fleck, Christopher; Virkus, Mark; Kobeszka, Edward

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	2009/056638	11-Sep-2009			
United States of America	ORD	Granted	12/558,122	11-Sep-2009	8,433,452	30-Apr-2013	15-Sep-2031

Docket No.: EP20-00117

Title: Cycloconverter Apparatus and Method for Working into an Active Load

Attorney(s): Polster Lieder

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Expired	676,468	13-Apr-1976	4,105,897	08-Aug-1978	13-Apr-1996

Docket No.:	EP20-00118						
Title:	Method and Apparatus for Transmitting Intelligence Over a Carrier Wave						
Attorney(s):	Polster Lieder						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	CIP	Expired	590,941	01-Jul-1975	4,106,007	08-Aug-1978	08-Aug-1995
United States of America	DIV	Expired	860,656	14-Dec-1977	4,218,655	19-Aug-1980	19-Aug-1997
Docket No.:	EP20-00119						
Title:	Method and Apparatus for Communication Over Electric Power Lines						
Attorney(s):	Polster Lieder						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	CON	Expired	197,043	15-Oct-1980	4,400,688	23-Aug-1983	23-Aug-2000
Docket No.:	EP20-00129						
Title:	Metrology Timekeeping Systems and Methods						
Attorney(s):	Senniger Powers						
Inventor(s):	Haynes, David D						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	2012/065764	19-Nov-2012			
United States of America	PRO	Pending	61/562,787	22-Nov-2011		22-Nov-2012	
Docket No.:	EP20-00133						
Title:	TWACS Pulse Inductor Reversal Circuit						
Attorney(s):	Polster Lieder						
Inventor(s):	Drumeller, Joshua K						

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	2012/064162	08-Nov-2012			
United States of America	PRO	Pending	61/559,794	15-Nov-2011		15-Nov-2012	
United States of America	ORD	Published	13/669,773	06-Nov-2012			

Docket No.: EP20-00134
Title: Device for Energy Load Control
Attorney(s):
Inventor(s): Hodge, James Graham; Holliday, Philip A

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Completed	95NZ68	27-Jul-1995			
United States of America	CON	Granted	08/743,162	04-Nov-1996	5,903,213	11-May-1999	27-Jul-2015

Note: From CIC acquisition.

Docket No.: EP20-00135
Title: Device for the Operation of Appliances, Utilities and Services Within a Building
Attorney(s):
Inventor(s): Hodge, James Graham; Holliday, Philip A; Bridgman, Gary C

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Completed	NZ1996/000110	04-Oct-1996			

Note: From CIC acquisition.

Docket No.: EP20-00136
Title: Method for Increasing Burst Capacity and/or Inbound Signal Strength by Innovative Approach for Electrical Energy Meters Used for Automated Meter Reading
Attorney(s): Polster Lieder
Inventor(s): Soni, Devendra K

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	11/186,312	21-Jul-2005	7,312,693	25-Dec-2007	21-Jul-2025

Docket No.: EP20-00138
Title: Smart Disconnect Switch Interbase (SmartDSI) for Automated Meter Reading (AMR) Network or AMR System
Attorney(s):
Inventor(s): Soni, Devendra K

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	11/063,200	22-Feb-2005	7,130,722	31-Oct-2006	22-Feb-2025

Docket No.: EP20-00139
Title: A Super-Fast Polling Scheme for Determining the Presence of Individual Meters on the Power Line
Attorney(s):
Inventor(s): Spencer, Quentin

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	11/075,506	09-Mar-2005	7,227,462	05-Jun-2007	24-Sep-2025

Docket No.: EP20-00141
Title: Prepayment Metering System Using Encoded Purchase Cards
Attorney(s):
Inventor(s): Sloan, Joseph W
Country **Case Type** **Status** **Application Number** **Filing Date** **Patent Number** **Issue Date** **Expiration Date**
Patent Cooperation Treaty ORD Completed 87US3241 07-Dec-1987
Note: From CIC acquisition.

Docket No.: EP20-00142
Title: Pre-paid Commodity System
Attorney(s):
Country **Case Type** **Status** **Application Number** **Filing Date** **Patent Number** **Issue Date** **Expiration Date**
United States of America PRI Expired 130,548 09-Dec-1987 4,795,892 03-Jan-1989 09-Dec-2007

Docket No.: EP20-00143
Title: Prepayment Metering System Using Encoded Purchase Cards From Multiple Locations
Attorney(s):
Inventor(s): Sloan, Joseph W; Snyder, Harry P; Foster, Joseph W; Day, Mark C; Berg, Timothy G; Jarreau, Michael; Miller, Mark P; Bush, A. Michael
Country **Case Type** **Status** **Application Number** **Filing Date** **Patent Number** **Issue Date** **Expiration Date**
Patent Cooperation Treaty ORD Completed WO91US271 11-Jan-1991
United States of America PRI Granted 464,328 12-Jan-1990 5,146,067 08-Sep-1992 12-Jan-2010
Note: From CIC acquisition.

Docket No.:	EP20-00145								
Title:	Distributed Frequency Relay								
Attorney(s):									
Inventor(s):	Hodge, James Graham; Sutton, Roger Anthony								
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date		
Patent Cooperation Treaty	ORD	Completed	97/00043	01-Apr-1997					
United States of America	CON	Granted	09/164,804	01-Oct-1998	6,314,378	06-Nov-2001	01-Apr-2016		

Note: From CIC acquisition.

Docket No.:	EP20-00146								
Title:	A Set of Irregular LDPC Codes with Random Structure and Low Encoding Complexity								
Attorney(s):	JJM								
Inventor(s):	Spencer, Quentin								
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date		
Patent Cooperation Treaty	ORD	Pending	US2006/033471	29-Aug-2006					
United States of America	PRI	Granted	11/232,072	21-Sep-2005	7,523,375	21-Apr-2009	24-Mar-2026		

Docket No.:	EP20-00148								
Title:	System and Method for Communication Between Remote								
Attorney(s):									
Inventor(s):	Colton, Laurence J								
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date		

Patent Cooperation Treaty	ORD	Completed	98US20379	29-Sep-1998	5,986,574	16-Nov-1999	16-Oct-2017
United States of America	PRI	Granted	08/949,440	16-Oct-1997	6,239,722	29-May-2001	16-Oct-2017
United States of America	CON	Granted	09/303,173	30-Apr-1999	6,509,841	21-Jan-2003	20-Jan-2018
United States of America	CON	Granted	09/703,298	01-Nov-2000			

Note: From CIC acquisition.

Docket No.:	EP20-00149						
Title:	Compression Scheme for Interval Data						
Attorney(s):	Polster Lieder						
Inventor(s):	Spencer, Quentin						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	12/146,154	25-Jun-2008	7,733,245 B	08-Jun-2010	04-Jul-2028

Docket No.:	EP20-00151						
Title:	Point-To-Point Communications Systems Particularly For Use In Power Distribution System						
Attorney(s):	Polster Lieder						
Inventor(s):	Rieken, David						
Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRO	Completed	61/182,483	29-May-2009		29-May-2010	
United States of America	ORD	Granted	12/613,217	05-Nov-2009	8,401,039	19-Mar-2013	23-May-2031

Docket No.:	EP20-00152						
Title:	Simultaneous Detection of Communications Signals on all Phases of a Multi-Phase Power Distribution Network						
Attorney(s):	Polster Lieder						
Inventor(s):	Spencer, Quentin						

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	12/026951	28-Feb-2012			
United States of America	PRO	Pending	61/447,365	28-Feb-2011		28-Feb-2012	
United States of America	ORD	Published	13/407,265	28-Feb-2012			

Docket No.: EP20-00153
Title: Transient Detector and Fault Classifier for a Power Distribution System
Attorney(s): Polster Lieder
Inventor(s): Abiprojo, Priotomo; Gregg, Gordon; Rieken, David

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	PRI	Published	US2011/022221	24-Jan-2011			
United States of America	PRI	Granted	12/692,919	25-Jan-2010	8,336,352	25-Dec-2012	25-Jan-2030

Docket No.: EP20-00154
Title: Load Control Apparatus With Peak Reduction In Aggregate
Attorney(s): Senniger Powers
Inventor(s): Fleck, Christopher

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	US2011/051915	16-Sep-2011			
United States of America	PRO	Pending	61/386,720	27-Sep-2010		27-Sep-2011	
United States of America	ORD	Published	13/233,173	15-Sep-2011			

Docket No.: EP20-00155
Title: Digital Two Way Automatic Communication System (TWACS) Outbound Receiver and Method

Attorney(s): Senniger Powers
Inventor(s): Rieken, David

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	2011/045740	28-Jul-2011			
United States of America	PRO	Pending	61/373,589	13-Aug-2010			
United States of America	ORD	Published	13/205,355	08-Aug-2011			

Docket No.: EP20-00156
Title: Agile Switched-Load Resonating Transmitter For Passband Power Line Communication
Attorney(s): Polster Lieder
Inventor(s): Rieken, David; Langenberg, Daniel

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	US11/47525	12-Aug-2011			
United States of America	PRO	Pending	61/373,586	13-Aug-2010		13-Aug-2011	
United States of America	ORD	Published	13/816,386	11-Feb-2013			

Docket No.: EP20-00157
Title: Mains-Synchronous Power-Line Communications System and Method
Attorney(s): Senniger Powers
Inventor(s): Rieken, David

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
---------	-----------	--------	--------------------	-------------	---------------	------------	-----------------

Patent Cooperation Treaty	ORD	Published	US2011/062510	30-Nov-2011	15-Feb-2012
United States of America	PRO	Pending	61/442,956	15-Feb-2011	
United States of America	PCT	Published	13/988,461	02-Jul-2013	

Docket No.: EP20-00158

Title: Utility Electric Meter Web Server

Attorney(s): Polster Lieder

Inventor(s): Langenberg, Daniel; Fleck, Christopher; Steidtmann, David

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	12/020763	10-Jan-2012	28-Jan-2012		
United States of America	PRO	Pending	61/437,094	28-Jan-2011			
United States of America	ORD	Published	13/347,242	10-Jan-2012			

Docket No.: EP20-00159

Title: Device, and Associated Method, for Monitoring a Meter

Attorney(s): Scheef & Stone

Inventor(s): Verdell Whitson, Ovie

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	CIP	Granted	12/105,258	17-Apr-2008	8,126,665	28-Feb-2012	28-Mar-2025
United States of America	CON	Pending	13/407,595	28-Feb-2012			

Docket No.: EP20-00161
Title: TWACS Transmitter and Receiver
Attorney(s): Senniger Powers
Inventor(s): Rieken, David; Hessling, Jr., John B

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRO	Pending	61/885,296	01-Oct-2013		01-Oct-2014	

Docket No.: EP20-00167
Title: Demand Response System With Field Area Network Gateway
Attorney(s): Senniger Powers
Inventor(s): Haynes, David D

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRO	Pending	61/837,443	20-Jun-2013		20-Jun-2014	

Docket No.: EP23-00002
Title: Apparatus for Communicating Utility Usage-Related Information from a Utility Usage Location to a Utility Usage
Attorney(s):
Inventor(s): Sears, Lawrence M.

Country	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	CON	Granted	547,408	5,617,084	01-Apr-1997	10-Sep-2013

Docket No.: EP23-00003

Title: Utility Meter Reading System
Attorney(s):
Inventor(s): Sears, Lawrence M.

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	644,501	10-May-1996	5,719,564	17-Feb-1998	10-May-2016

Docket No.: EP23-00004
Title: Meter Transmission Unit for use with a Pit Set Utility Meter
Attorney(s):
Inventor(s): Sears, Lawrence M.

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	PRI	Granted	09/059,323	13-Apr-1998	6,072,405	06-Jun-2000	13-Apr-2018

Docket No.: EP23-00005
Title: Wireless Broadband Communications Network for a Utility
Attorney(s): Polster Lieder
Inventor(s): Smith, Ronald; Thompson, Mark

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Pending	19-Feb-2010				
United States of America	PRI	Pending	61/154,037	20-Feb-2009			
United States of America	ORD	Granted	12/709,913	22-Feb-2010	8,441,372	14-May-2013	16-Aug-2031

Docket No.: EP23-00007
Title: Planar Dipole Antenna
Attorney(s): Brinks Gilson
Inventor(s): Wilbur, Mark; Pollock, James; Hennigan, Justin

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
United States of America	ORD	Granted	12/832,332	08-Jul-2010	8,427,337	23-Apr-2013	08-Jul-2030

Docket No.: EP23-00008
Title: Random Number Generator
Attorney(s): Brinks Gilson
Inventor(s): Emelko, Glenn A; Gillooly, Gregory B.

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	US2010/057245	18-Nov-2010			
United States of America	PRO	Pending	61/264,625	25-Nov-2009		25-Nov-2010	
United States of America	ORD	Published	13/511,405	26-Sep-2012			

Docket No.: EP23-00009
Title: Cryptographically Secure Authentication Device, System and Method
Attorney(s): Senniger Powers
Inventor(s): Emelko, Glenn A

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration Date
Patent Cooperation Treaty	ORD	Published	US2010/057054	17-Nov-2010			
United States of America	PCT	Published	13/512,095	25-May-2012			
United States of America	CON	Pending	14/156,765	16-Jan-2014			

Patents and applications from Metrum asset acquisition

Country	Application No.	Patent No.	Filing Date	Inventor	Title	Status
US		8,126,665	4/17/2008	Whitson	Device, and Associated Method, for Monitoring a Meter	Granted
US	60/556,619		3/26/2004	Whitson	Device, and Associated Method, for Monitoring a Meter	Abandoned
US	11/092,287		3/28/2005	Whitson	Device, and Associated Method, for Monitoring a Meter	Abandoned
US	13/407,595		2/28/2012	Whitson	Device, and Associated Method, for Monitoring a Meter	Pending
US	61/788,957		3/15/2013	Whitson	Device, and Associated Method, for Communication	Pending

Note: These items are jointly owned with Metrum Technologies, LLC pursuant to a certain Patent Co-ownership and License Agreement dated December 31, 2012. Provisional application 61/788,957 will be automatically abandoned on March 16, 2014. A non-provisional application claiming priority to the provisional may be filed before then.

Emelko patents (pre-Aclara employment):

Docket No.: EP14-00002
Title: System For Encoding Base N Data Using a Multi-Level Coding Scheme
Attorney(s):
Inventor(s): Emelko, Glenn A

Country	Case Type	Status	Application Number	Filing Date	Patent Number	Issue Date	Expiration
United States of America	PRI	Granted	08/767,371	16-Dec-1996	5,903,231	11-May-1999	16-Dec-2016
United States of America	CIP	Granted	08/898,314	22-Jul-1997	6,122,010	19-Sep-2000	16-Dec-2016

Note: Glenn Emelko has a right to repurchase these patents under certain circumstances per the Agreement for Sale of Patents of January 25, 2008.