

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT2791110

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| SUBMISSION TYPE: | NEW ASSIGNMENT |
| NATURE OF CONVEYANCE: | PATENT SECURITY AGREEMENT |
| CONVEYING PARTY DATA | |
| Name | Execution Date |
| ACLARA TECHNOLOGIES LLC | 03/28/2014 |
| RECEIVING PARTY DATA | |
| Name: | CERBERUS BUSINESS FINANCE, LLC, AS AGENT |
| Street Address: | 875 THIRD AVENUE |
| City: | NEW YORK |
| State/Country: | NEW YORK |
| Postal Code: | 10022 |
| PROPERTY NUMBERS Total: 107 | |
| Property Type | Number |
| Application Number: | 61164049 |
| Application Number: | 12731825 |
| PCT Number: | US0886183 |
| Application Number: | 12809134 |
| PCT Number: | US0775548 |
| Application Number: | 11836354 |
| Application Number: | 12377177 |
| Application Number: | 60837354 |
| PCT Number: | US0775547 |
| Application Number: | 11836381 |
| Application Number: | 60837349 |
| PCT Number: | US0763393 |
| Application Number: | 60780152 |
| Application Number: | 11682747 |
| PCT Number: | US0643084 |
| Application Number: | 11270789 |
| Application Number: | 10430786 |
| Application Number: | 10645468 |
| Patent Number: | 4658238 |
| Application Number: | 07185792 |
| Application Number: | 07227343 |

PATENT

| Property Type | Number |
|---------------------|--------------|
| Application Number: | 07421794 |
| Application Number: | 07481247 |
| PCT Number: | US9209003 |
| Application Number: | 07809588 |
| PCT Number: | US9209001 |
| Application Number: | 07722134 |
| Application Number: | 08086085 |
| PCT Number: | US9304922 |
| Application Number: | 07982633 |
| Application Number: | 08242597 |
| Application Number: | 08966447 |
| PCT Number: | US0860731 |
| Application Number: | 12596987 |
| PCT Number: | US0954482 |
| Application Number: | 12549472 |
| PCT Number: | US0956638 |
| Application Number: | 12558122 |
| Application Number: | 05590941 |
| Application Number: | 05860656 |
| Application Number: | 06197043 |
| PCT Number: | US2012065764 |
| Application Number: | 61562787 |
| PCT Number: | US2012064162 |
| Application Number: | 61559794 |
| Application Number: | 13669773 |
| Application Number: | 08743162 |
| Application Number: | 11186312 |
| Application Number: | 11063200 |
| Application Number: | 11075506 |
| PCT Number: | US1987003241 |
| Patent Number: | 4795892 |
| Patent Number: | 5146067 |
| PCT Number: | US9700043 |
| Application Number: | 09164804 |
| PCT Number: | US2006033471 |
| Application Number: | 11232072 |
| PCT Number: | US9820379 |
| Application Number: | 08949440 |
| Application Number: | 09303173 |

PATENT

| Property Type | Number |
|---------------------|--------------|
| Application Number: | 09703298 |
| Application Number: | 12146154 |
| Application Number: | 61182483 |
| Application Number: | 12613217 |
| Application Number: | 12026951 |
| Application Number: | 61447365 |
| Application Number: | 13407265 |
| PCT Number: | US2011022221 |
| Application Number: | 12692919 |
| PCT Number: | US2011051915 |
| Application Number: | 61386720 |
| Application Number: | 13233173 |
| PCT Number: | US2011045740 |
| Application Number: | 61373589 |
| Application Number: | 13205355 |
| PCT Number: | US2011047525 |
| Application Number: | 61373586 |
| Application Number: | 13816386 |
| PCT Number: | US2011062510 |
| Application Number: | 61442956 |
| Application Number: | 13988461 |
| Application Number: | 12020763 |
| Application Number: | 61437094 |
| Application Number: | 13347242 |
| Application Number: | 12105258 |
| Application Number: | 13407595 |
| Application Number: | 61885296 |
| Application Number: | 61837443 |
| Patent Number: | 5617084 |
| Patent Number: | 5719564 |
| Application Number: | 09059323 |
| Application Number: | 61154037 |
| Application Number: | 12709913 |
| Application Number: | 12832332 |
| PCT Number: | US2010057245 |
| Application Number: | 61264625 |
| Application Number: | 13511405 |
| PCT Number: | US2010057054 |
| Application Number: | 13512095 |

PATENT

| Property Type | Number |
|---------------------|-----------|
| Application Number: | 14156765 |
| Patent Number: | 8126665 |
| Application Number: | 60556619 |
| Application Number: | 11092287 |
| Application Number: | 61788957 |
| Application Number: | 08767371 |
| Application Number: | 08898314 |
| PCT Number: | US1028592 |

CORRESPONDENCE DATA

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Address Line 4: NEW YORK, NEW YORK 10022

ATTORNEY DOCKET NUMBER: 014951-1438

NAME OF SUBMITTER: MELISSA KARP (014951-1438)

SIGNATURE: /kc for mk/

DATE SIGNED: 03/28/2014

Total Attachments: 27

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PATENT SECURITY AGREEMENT

This Patent Security Agreement (this “Assignment”) is made as of this 28th day of March, 2014, by the Assignors listed on the signature pages hereof (each an “Assignor” and collectively, jointly and severally, the “Assignors”), in favor of CERBERUS BUSINESS FINANCE, LLC, in its capacity as agent for the Lenders (together with its successors and assigns in such capacity, “Agent”).

WHEREAS, pursuant to that certain 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 “Loan 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 Loan Agreement, the Assignors are required to execute and deliver to Agent, for the benefit of the Lenders, this Assignment.

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 Assignor hereby agrees as follows:

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

2. **Grant of Security Interest in Patent Collateral.** Each Assignor hereby grants to Agent, for the benefit of the Lenders, a continuing first priority (subject to Permitted Encumbrances) security interest in all of such Assignor’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 Assignor’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 Assignor 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 Loan 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 Assignment 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 Assignment secures the payment of all amounts which constitute part of the Obligations and would be owed by Assignors, 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 Assignor.

4. **Loan Agreement.** The security interests granted pursuant to this Assignment are granted in conjunction with the security interests granted to Agent, for the benefit of the Lenders, pursuant to the Loan Agreement. Each Assignor 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 Loan Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein.

5. **Authorization to Supplement.** If any Assignor shall obtain rights to any new Patents or Licenses for Patents, this Assignment shall automatically apply thereto. Each Assignor shall give prompt notice in writing to Agent with respect to any such new Patent or Licenses for Patents. Without limiting any Assignor's obligations under this Section 5, each Assignor hereby authorizes Agent unilaterally to modify this Assignment by amending **Schedule I** to include any such new U.S. patents (to the extent provided in the Loan Agreement), U.S. published patent applications or Licenses (to the extent provided in the Loan Agreement) for Patents of such Assignor. Notwithstanding the foregoing, no failure to so modify this Assignment 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 Assignment 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 Assignment 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 Assignment 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 Assignment or

any Other Document refer to this Assignment or such Other Document, as the case may be, as a whole and not to any particular provision of this Assignment or such Other Document, as the case may be. Section, subsection, clause, schedule, and exhibit references herein are to this Assignment unless otherwise specified. Any reference in this Assignment 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 Loan 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, the Assignor has caused this Assignment to be duly executed by its officer thereunto duly authorized as of the date first set forth above.

ACLARA TECHNOLOGIES LLC

By: *Daniel M. Florian*
Name: DANIEL FLORIAN
Title: VICE PRESIDENT

AGENT:
CERBERUS BUSINESS FINANCE, LLC

By: _____

Name: *Daniel Wolf*
Title: *President*

Assignment for Security - Patents

PATENT
REEL: 032554 FRAME: 0921

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 | | | |
| United States of America | ORD | Granted | 11/836,354 | 09-Aug-2007 | 8,040,251 | 18-Oct-2011 | 16-Jun-2030 |
| United States of America | PCT | Granted | 12/377,177 | 11-Feb-2009 | 8456285 | 04-Jun-2013 | 22-May-2029 |
| United States of America | PRO | Completed | 60/837,354 | 11-Aug-2006 | | 11-Aug-2007 | |

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 | | | |
| United States of America | ORD | Granted | 11/836,381 | 09-Aug-2007 | 7,831,884 | 09-Nov-2010 | 09-Aug-2027 |
| United States of America | PRO | Completed | 60/837,349 | 11-Aug-2006 | | 11-Aug-2007 | |

Docket No.: EP20-00085

Title: Intelligent Fault Detector System and Method

Attorney(s): Polster Lieder

Inventor(s): Mak, Sioe 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 | | | |

PATENT

REEL: 032554 FRAME: 0923

| | | | | | | | | |
|--------------------------|-----|-----------|------------|-------------|-------------|-----------|-------------|-------------|
| United States of America | PRO | Completed | 60/780,152 | 08-Mar-2006 | 08-Mar-2007 | 7,496,430 | 08-Mar-2007 | 06-Mar-2027 |
| United States of America | PRI | Granted | 11/682,747 | 06-Mar-2007 | 24-Feb-2009 | | | |

Docket No.: EP20-00087

Title: Tamper Detection Apparatus For Electrical Meters

Attorney(s): Polster Lieder

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 Lieder

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

Country: United States of America
Case Type: PRI
Status: Granted
Application Number: 07/421,794
Filing Date: 16-Oct-1989
Patent Number: 4,963,853
Issue Date: 16-Oct-1990
Expiration Date: 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, Sioe T
Country: United States of America
Case Type: PRI
Status: Granted
Application Number: 07/481,247
Filing Date: 20-Feb-1990
Patent Number: 4,996,513
Issue Date: 26-Feb-1991
Expiration Date: 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 | Case Type | Status | Application Number | Filing Date | Patent Number | Issue Date | Expiration Date |
|---------|-----------|--------|--------------------|-------------|---------------|------------|-----------------|
|---------|-----------|--------|--------------------|-------------|---------------|------------|-----------------|

PATENT

REEL: 032554 FRAME: 0927

Patent Cooperation Treaty ORD Completed US93/04922 25-May-1993 5,310,075 10-May-1994 27-Nov-2012
United States of America PRI Granted 07/982,633 27-Nov-1992

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 **Case Type** **Status** **Application Number** **Filing Date** **Patent Number** **Issue Date** **Expiration Date**
United States of America PRI Granted 08/242,597 13-May-1994 5,696,441 09-Dec-1997 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 **Case Type** **Status** **Application Number** **Filing Date** **Patent Number** **Issue Date** **Expiration Date**
United States of America PRI Granted 08/966,447 07-Nov-1997 5,933,072 03-Aug-1999 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 |
|---------|-----------|--------|--------------------|-------------|---------------|------------|-----------------|
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Assignment for Security - Patents

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|--------------------------|-----|---------|---------|-------------|-----------|-------------|-------------|
| 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): Hodge, James Graham; Sutton, Roger Anthony
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): 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 | | | |
| United States of America | PRI | Granted | 08/949,440 | 16-Oct-1997 | 5,986,574 | 16-Nov-1999 | 16-Oct-2017 |
| United States of America | CON | Granted | 09/303,173 | 30-Apr-1999 | 6,239,722 | 29-May-2001 | 16-Oct-2017 |
| United States of America | CON | Granted | 09/703,298 | 01-Nov-2000 | 6,509,841 | 21-Jan-2003 | 20-Jan-2018 |

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 | |

Assignment for Security - Patents

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 |
|---------|-----------|--------|--------------------|-------------|---------------|------------|-----------------|
|---------|-----------|--------|--------------------|-------------|---------------|------------|-----------------|

Assignment for Security - Patents

| | | | | |
|---------------------------|-----|-----------|-------------|-------------|
| 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 | | | |
| United States of America | PRO | Pending | 61/442,956 | 15-Feb-2011 | | 15-Feb-2012 | |
| 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 | | | |
| United States of America | PRO | Pending | 61/437,094 | 28-Jan-2011 | | 28-Jan-2012 | |
| 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 | | | |
| United States of America | CON | Pending | 13/407,595 | 28-Feb-2012 | 8,126,665 | 28-Feb-2012 | 28-Mar-2025 |

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): Sears, Lawrence M.

| Country | Status | Application Number | Filing Date | Patent Number | Issue Date | Expiration Date | |
|--------------------------|--------|--------------------|-------------|---------------|------------|-----------------|-------------|
| United States of America | CON | Granted | 547,408 | 24-Oct-1995 | 5,617,084 | 01-Apr-1997 | 10-Sep-2013 |

Docket No.: EP23-00003
Title: Utility Meter Reading System
Attorney(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): 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 | | | |

PATENT

REEL: 032554 FRAME: 0941

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.