

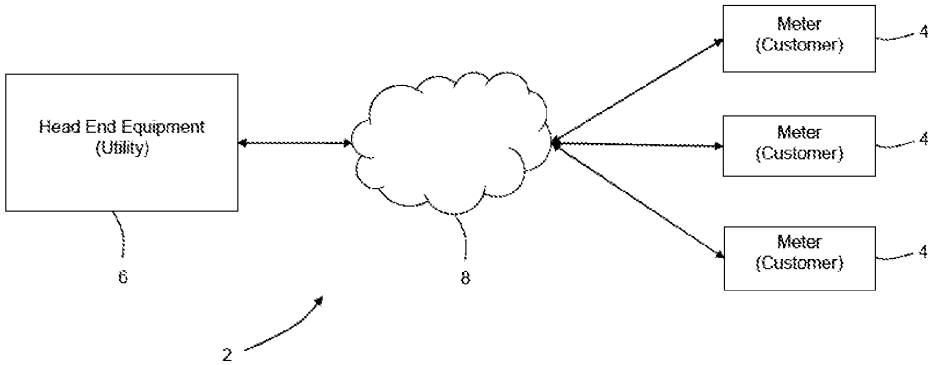


FIG. 1

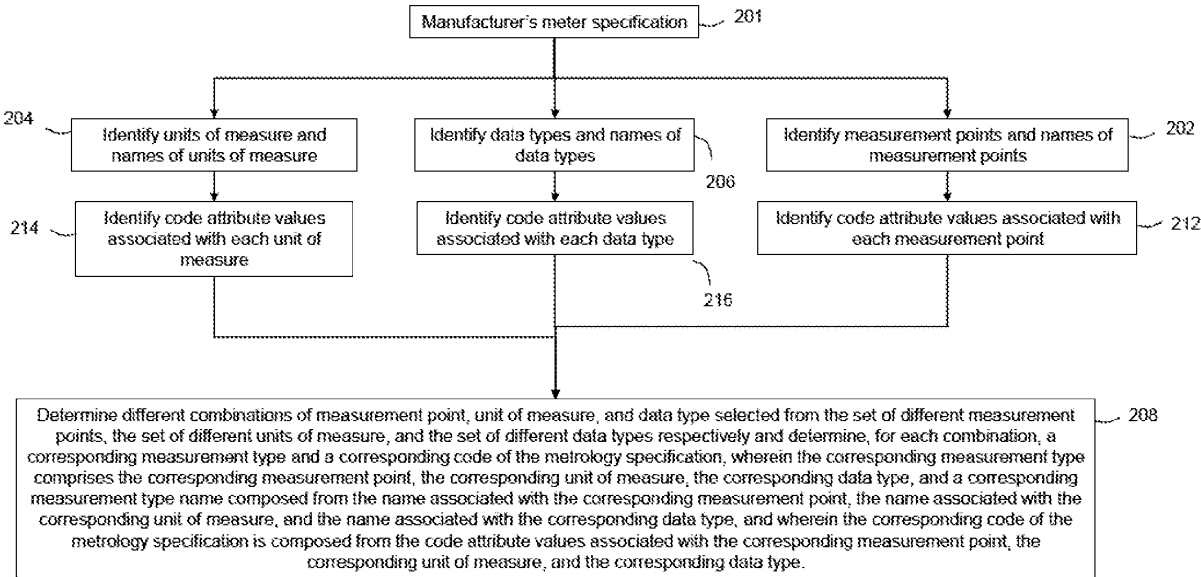
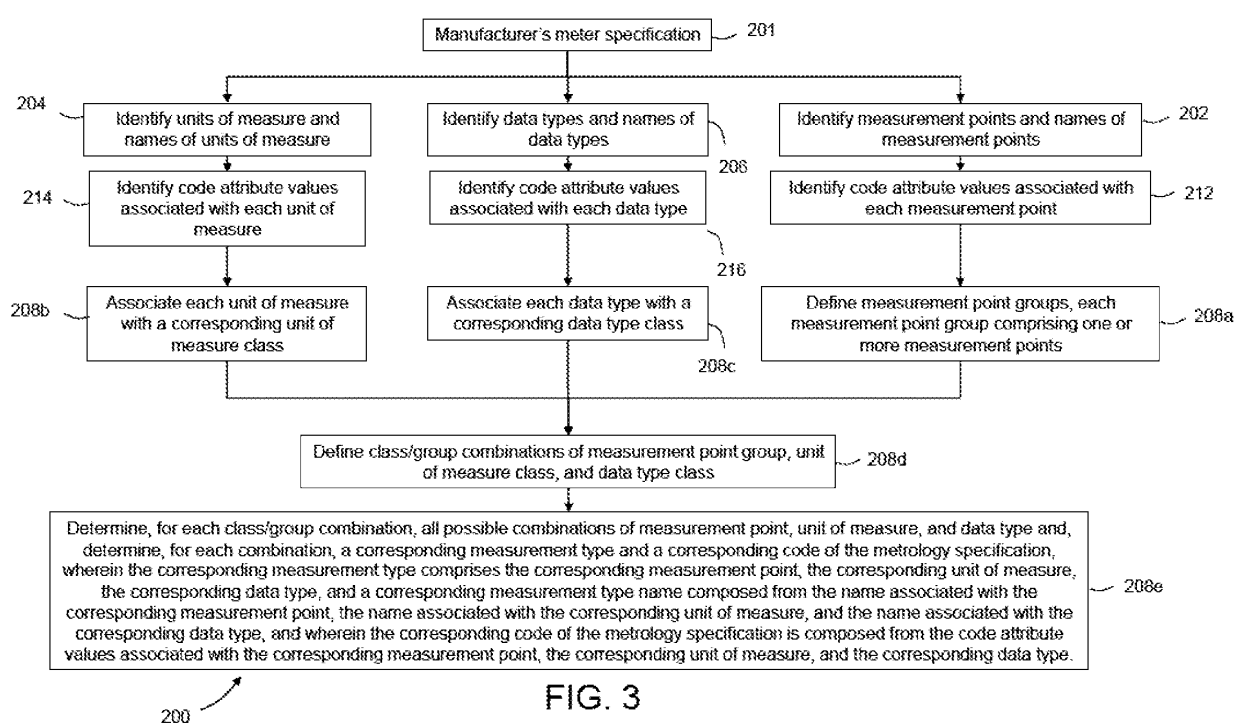
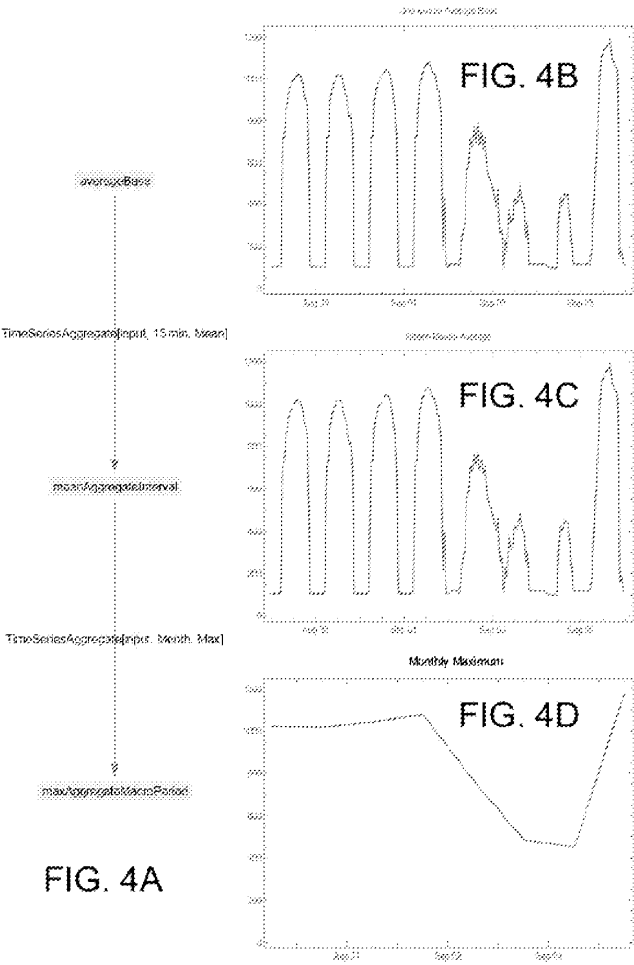
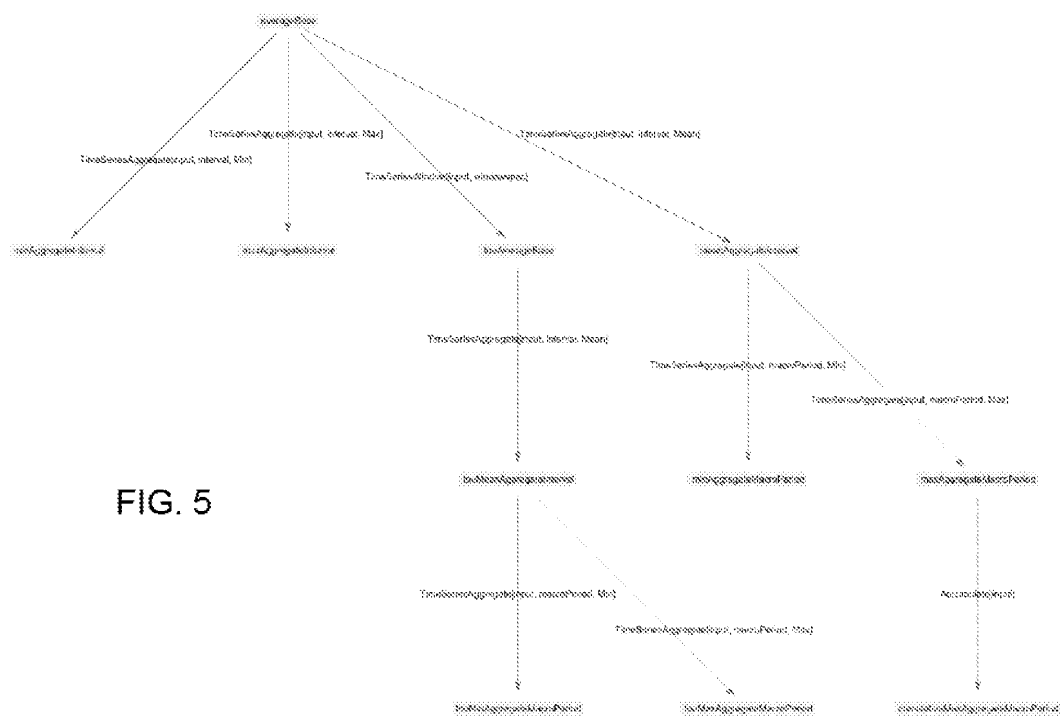


FIG. 2

200







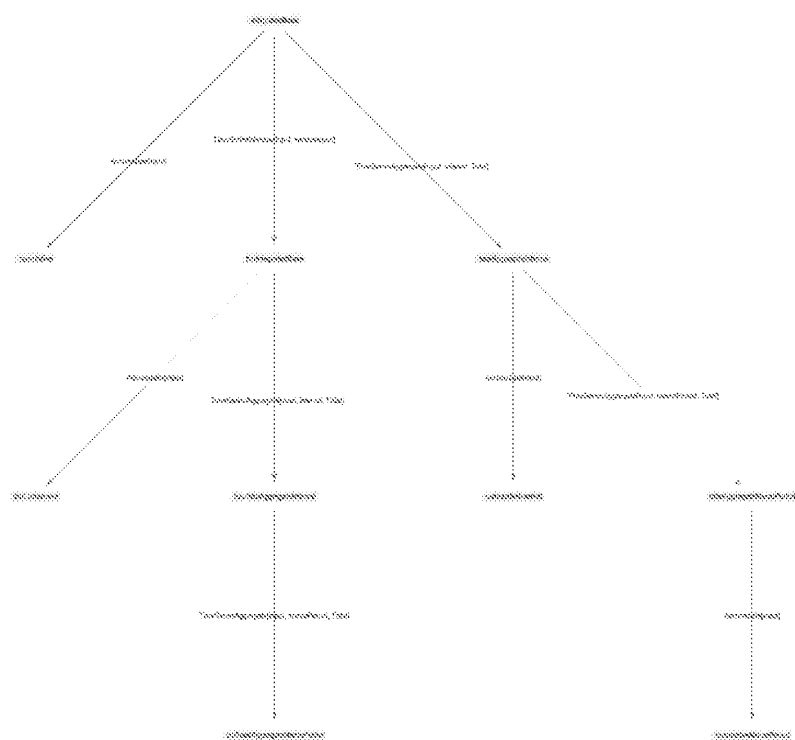


FIG. 6

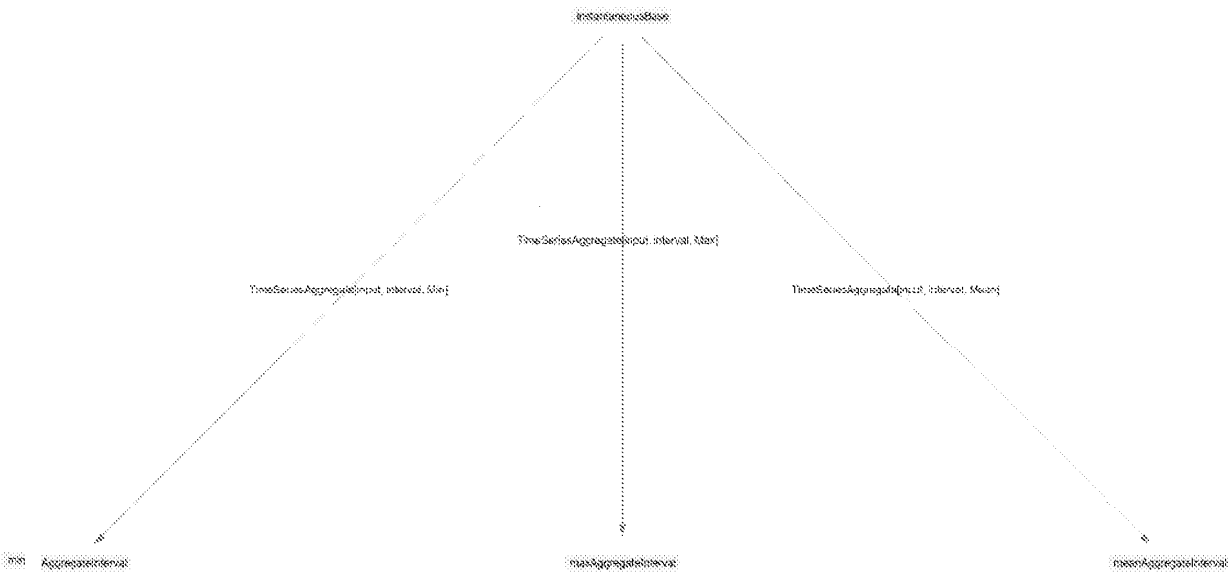


FIG. 7

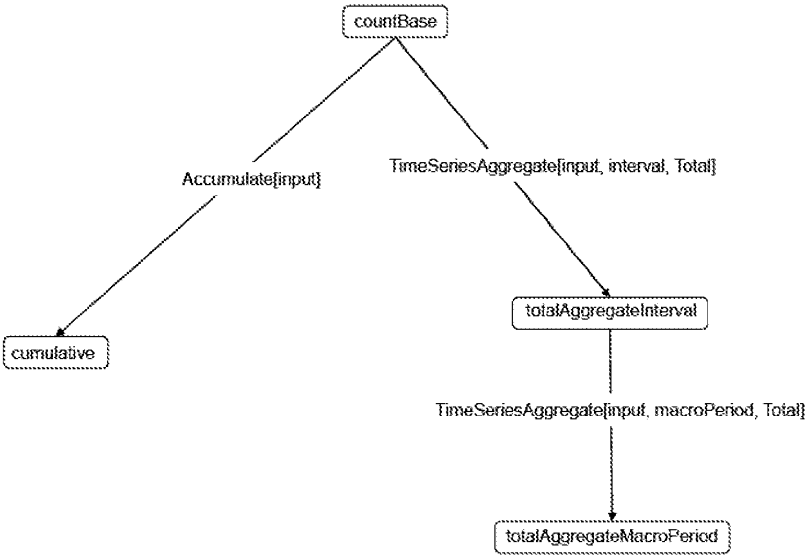


FIG. 8

Measurement Point Name	dimPhases
none	0
phaseC	32
phaseB	64
phaseA	128
phasesABC	224
phaseNtoGnd	17
anyPhase	300
loadSidePhaseA	301
loadSidePhaseB	302
loadSidePhaseC	303
phaseCtoN	33
phaseBtoN	65
phaseAtoN	129
externalInput1	306
externalInput2	307

FIG. 9A

	members
oneThroughFour	{ none , phaseC , phaseB , phaseA }
one	{ none }
oneElevenThroughThirteen	{ none , phaseCtoN , phaseBtoN , phaseAtoN }
oneEightTen	{ none , loadSidePhaseA , loadSidePhaseC }
twoThreeFour	{ phaseC , phaseB , phaseA }
external1	{ externalInput1 }
external2	{ externalInput2 }

FIG. 9B

Unit of Measure Class	Unit of Measure Name	UnitFlowDirection	UnitConversion	UnitMeasurementRef	UnitMeasurementDesc	UnitMeasurementDesc	UnitMeasurementDesc	UnitMeasurementDesc
threePhaseEnergy	kWh Q4	18	1	0	0	0	0	0
threePhaseEnergy	kWh Q3	17	1	0	0	0	0	0
threePhaseEnergy	kWh Q2	16	1	0	0	0	0	0
threePhaseEnergy	kWh Rev2	10	1	0	0	0	0	0
threePhaseEnergy	kWh Q1	15	1	0	0	0	0	0
threePhaseEnergy	kWh Del	8	1	0	0	0	0	0
threePhaseEnergy	kWh Net	4	1	0	0	0	0	0
threePhaseEnergy	kWh Sum	20	1	0	0	0	0	0
threePhaseEnergy	Phasor kWh Q4	18	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Q3	17	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Q2	16	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Rev2	10	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Q1	15	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Del	8	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Net	4	1	323	0	0	0	0
threePhaseEnergy	Phasor kWh Sum	20	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Q4	18	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh Q3	18	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Q2	17	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh Q1	17	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Rev2	11	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh Sum	11	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Q2	16	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh Q3	16	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q2+Q3)	11	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q2+Q4)	11	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q3+Q4)	11	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q2+Q3)	10	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q2+Q3)	10	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Q1	15	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh Q1	15	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q1+Q4)	8	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q1+Q4)	8	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q1+Q3)	7	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh (Q1+Q3)	7	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Del	5	1	0	0	0	0	0
threePhaseEnergy	Reactive kVARh Del	5	1	323	0	0	0	0
threePhaseEnergy	Reactive kVARh Sum	20	1	0	0	0	0	0

FIG. 10A

ThreePhaseEnergy	Phasor kVARh Sum	26	323	0	0	26	0	0
ThreePhaseEnergy	Reactive kVARh Net	4	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Net	4	323	0	0	26	0	26
ThreePhaseEnergy	Reactive kVARh (Q3+Q4) (Q3+Q4)	500	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q3+Q4) (Q3+Q4)	500	323	0	0	26	0	26
ThreePhaseEnergy	Reactive kVARh (Q3+Q4) (Q3+Q4)	500	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q3+Q4) (Q3+Q4)	500	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Q4	18	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Q4	18	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Q3	17	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Q3	17	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh (Q3+Q4)	15	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q3+Q4)	15	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Q2	16	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Q2	16	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh (Q2+Q4)	11	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q2+Q4)	11	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Total	10	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Total	10	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Q1	15	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Q1	15	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Q1	8	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Q1	8	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh (Q1+Q3)	7	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q1+Q3)	7	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh (Q1+Q2)	5	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q1+Q2)	5	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Sum	20	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Sum	20	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh Net	4	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh Net	4	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh (Q1+Q2) (Q1+Q2)	303	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q1+Q2) (Q1+Q2)	303	323	0	0	26	0	26
ThreePhaseEnergy	Apparent kVARh (Q1+Q3) (Q1+Q3)	300	0	0	0	26	0	26
ThreePhaseEnergy	Phasor kVARh (Q1+Q3) (Q1+Q3)	300	323	0	0	26	0	26

FIG. 10B

Data Type Name	Data Type Class	cinMacroPeriod	cinAggregate	cinMeasuringPeriod	cinAccumulation	cinArgumentNum	cinArgumentDen	cinTou	cinCpy	cinConsumptionTier
h8IntegratingMacroPeriod	integratingMacro	8	0	0	4	0	0	0	0	0
h8IntegratingMacroPeriod	integratingMacro	8	0	0	1	0	0	0	0	0
dailyIntegratingMacroPeriod	integratingMacro	11	0	0	4	0	0	0	0	0
dailyAccumulatingMacroPeriod	accumulatingMacro	11	0	0	1	0	0	0	0	0
quarterlyIntegratingMacroPeriod	integratingMacro	13	0	0	4	0	0	0	0	0
quarterlyAccumulatingMacroPeriod	accumulatingMacro	13	0	0	1	0	0	0	0	0
oneMinuteMinimumInterval	time	0	5	5	0	0	0	0	0	0
oneMinuteMaximumInterval	time	0	8	3	0	0	0	0	0	0
oneMinuteHighLowInterval	time	0	2	3	0	0	0	0	0	0
oneMinuteMedianInterval	time	0	2	3	0	0	0	0	0	0
oneMinuteStdDevInterval	time	0	0	3	12	0	0	0	0	0
twoMinuteMinimumInterval	time	0	5	10	0	0	0	0	0	0
twoMinuteMaximumInterval	time	0	8	10	0	0	0	0	0	0
twoMinuteHighLowInterval	time	0	2	10	0	0	0	0	0	0
twoMinuteMedianInterval	time	0	2	10	0	0	0	0	0	0
twoMinuteStdDevInterval	time	0	0	10	12	0	0	0	0	0
fiveMinuteMinimumInterval	time	0	5	0	0	0	0	0	0	0
fiveMinuteMaximumInterval	time	0	8	0	0	0	0	0	0	0
fiveMinuteHighLowInterval	time	0	2	5	0	0	0	0	0	0
fiveMinuteMedianInterval	time	0	2	5	0	0	0	0	0	0
fiveMinuteStdDevInterval	time	0	0	5	12	0	0	0	0	0
tenMinuteMinimumInterval	time	0	5	0	0	0	0	0	0	0
tenMinuteMaximumInterval	time	0	8	0	0	0	0	0	0	0

FIG. 11A

tenMinuteBeginInterval	time	0	2	1	0	0	0	0	0	0	0
tenMinuteMeanInterval	meanVA	0	2	1	0	0	0	0	0	0	0
tenMinuteEndInterval	time	0	0	1	12	0	0	0	0	0	0
fifteenMinuteMinimumInterval	time	0	0	2	0	0	0	0	0	0	0
fifteenMinuteMaximumInterval	time	0	0	2	0	0	0	0	0	0	0
fifteenMinuteBeginInterval	time	0	2	2	0	0	0	0	0	0	0
fifteenMinuteMeanInterval	meanVA	0	2	2	0	0	0	0	0	0	0
fifteenMinuteEndInterval	time	0	0	2	12	0	0	0	0	0	0
thirtyMinuteMinimumInterval	time	0	0	0	0	0	0	0	0	0	0
thirtyMinuteMaximumInterval	time	0	0	0	0	0	0	0	0	0	0
thirtyMinuteBeginInterval	time	0	2	0	0	0	0	0	0	0	0
thirtyMinuteMeanInterval	meanVA	0	2	0	0	0	0	0	0	0	0
thirtyMinuteEndInterval	time	0	0	0	12	0	0	0	0	0	0
sixtyMinuteMinimumInterval	time	0	0	0	0	0	0	0	0	0	0
sixtyMinuteMaximumInterval	time	0	0	0	0	0	0	0	0	0	0
sixtyMinuteBeginInterval	time	0	2	0	0	0	0	0	0	0	0
sixtyMinuteMeanInterval	meanVA	0	2	0	0	0	0	0	0	0	0
sixtyMinuteEndInterval	time	0	0	0	12	0	0	0	0	0	0
dailyMinimumMacroPeriod	minimumMacro	0	0	0	0	0	0	0	0	0	0
dailyMaximumMacroPeriod	maximumMacro	0	0	0	0	0	0	0	0	0	0
dailyMeanMacroPeriod	meanMacro	0	0	0	0	0	0	0	0	0	0
dailyMinimumMacroPeriod	minimumMacro	11	0	0	0	0	0	0	0	0	0
dailyMaximumMacroPeriod	maximumMacro	11	0	0	0	0	0	0	0	0	0
dailyMeanMacroPeriod	meanMacro	11	0	0	0	0	0	0	0	0	0

FIG. 11B

Combination Name	Data Type Class	Unit of Measure Class	Measurement Point Group
threePhaseEnergy	accumulating	threePhaseEnergy	oneThroughFour
calculatedNetEnergy	accumulating	calculatedNetEnergy	one
threePhaseEnergy	integratedInterval	threePhaseEnergy	oneThroughFour
threePhasePowerMax	maximum	threePhasePower	oneThroughFour
demandTimestamp	maximumTimestamp	demandTimestamp	oneThroughFour
threePhasePowerMaximumPlus	maximumPlus	threePhasePower	one
powerFactorMin	minimum	powerFactor	oneThroughFour
powerFactorMean	mean	powerFactor	oneThroughFour
threePhasePower	rms	threePhasePower	oneThroughFour
volts	instantaneous	volts	oneElevenThroughThirteen
loadSideVolts	instantaneous	loadSideVolts	eightTen
amps	instantaneous	amps	twoThroughFour
threePhasePowerInstantaneous	instantaneous	threePhasePower	oneThroughFour
quadrantlessWatts	instantaneous	quadrantlessWatts	one
volts	rms	volts	oneElevenThroughThirteen
amps	rms	amps	twoThroughFour
externalInput1	external	external	external1
externalInput2	external	external	external2
maximumMacro	maximumMacro	threePhasePower	oneThroughFour
sagSwells	countInterval	count	oneThroughFour
frequencyMean	mean	frequency	one
frequencyInstantaneous	instantaneous	frequency	one
minimumPlus	minimumPlus	powerFactor	one
minimumTimestamp	minimumTimestamp	powerFactorTimestamp	one
threePhasePowerRms	rms	threePhasePower	oneThroughFour
voltsmVA	meanVA	volts	oneElevenThroughThirteen
ampsmVA	meanVA	amps	oneThroughFour
count	countInterval	count	oneThroughFour
voltsCorrected	meanVACorrected	correctedAmps	oneElevenThroughThirteen
ampsCorrected	meanVACorrected	correctedVolts	oneThroughFour
thdTemp	rms	rms	oneThroughFour
meta	meta	meta	one
meterCount	count	meterCount	one

FIG. 12

Example Reading Type Code Generation

Function Definition

Start with a single combination

In this case this is for interval consumption values.

`combination = EntityValue(EntityList["readingTypeCombinations"][1], "Dataset")`

overlaid	Name	maximumMacro
	simple Data Type Class	maximumMacro
	simple Measurement Point Group	oneThroughFour
	simple Unit Of Measure Class	threePhasePower

FIG. 13A

For each combination generate the lgCode, lgDescription, cimCode, cimDescription

codeDataset = Dataset{c:simpleCodesToCIMToIG{m} & />reverseSimpleCodes{}}

billingMaximumMacroPeriod KW Q4 none
billingMaximumMacroPeriod KW Q4 phaseC
billingMaximumMacroPeriod KW Q4 phaseB
billingMaximumMacroPeriod KW Q4 phaseA
billingMaximumMacroPeriod KW Q3 none
billingMaximumMacroPeriod KW Q3 phaseC
billingMaximumMacroPeriod KW Q3 phaseB
billingMaximumMacroPeriod KW Q3 phaseA
billingMaximumMacroPeriod KW Q2 none
billingMaximumMacroPeriod KW Q2 phaseC
billingMaximumMacroPeriod KW Q2 phaseB
billingMaximumMacroPeriod KW Q2 phaseA
billingMaximumMacroPeriod KW Revd none
billingMaximumMacroPeriod KW Revd phaseC
billingMaximumMacroPeriod KW Revd phaseB
billingMaximumMacroPeriod KW Revd phaseA
billingMaximumMacroPeriod KW Q1 none
billingMaximumMacroPeriod KW Q1 phaseC
billingMaximumMacroPeriod KW Q1 phaseB
billingMaximumMacroPeriod KW Q1 phaseA

FIG. 13D

Measurement Type Name	cinCode	cinDescription
billingMaximumMacroPeriod kW Q4 none	8.8.0.6.18.1.0.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum quadrant4 electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Q4 phaseC	8.8.0.6.18.1.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum quadrant4 electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Q4 phaseB	8.8.0.6.18.1.0.0.0.0.0.0.0.34.3.38.0	billingPeriod maximum quadrant4 electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Q4 phaseA	8.8.0.6.18.1.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum quadrant4 electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Q3 none	8.8.0.6.17.1.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum quadrant3 electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Q3 phaseC	8.8.0.6.17.1.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum quadrant3 electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Q3 phaseB	8.8.0.6.17.1.0.0.0.0.0.0.0.54.3.38.0	billingPeriod maximum quadrant3 electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Q3 phaseA	8.8.0.6.17.1.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum quadrant3 electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Q2 none	8.8.0.6.16.1.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum quadrant2 electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Q2 phaseC	8.8.0.6.16.1.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum quadrant2 electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Q2 phaseB	8.8.0.6.16.1.0.0.0.0.0.0.0.54.3.38.0	billingPeriod maximum quadrant2 electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Q2 phaseA	8.8.0.6.16.1.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum quadrant2 electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Rcvd none	8.8.0.6.16.1.0.0.0.0.0.0.0.5.5.38.0	billingPeriod maximum Q2plusQ3 electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Rcvd phaseC	8.8.0.6.16.1.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum Q2plusQ3 electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Rcvd phaseB	8.8.0.6.16.1.0.0.0.0.0.0.0.54.3.38.0	billingPeriod maximum Q2plusQ3 electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Rcvd phaseA	8.8.0.6.16.1.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum Q2plusQ3 electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Q1 none	8.8.0.6.15.1.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum quadrant1 electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Q1 phaseC	8.8.0.6.15.1.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum quadrant1 electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Q1 phaseB	8.8.0.6.15.1.0.0.0.0.0.0.0.54.3.38.0	billingPeriod maximum quadrant1 electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Q1 phaseA	8.8.0.6.15.1.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum quadrant1 electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Del none	8.8.0.6.3.1.0.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum Q1plusQ4 electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Del phaseC	8.8.0.6.3.1.0.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum Q1plusQ4 electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Del phaseB	8.8.0.6.3.1.0.0.0.0.0.0.0.0.64.3.38.0	billingPeriod maximum Q1plusQ4 electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Del phaseA	8.8.0.6.3.1.0.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum Q1plusQ4 electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Net none	8.8.0.6.4.1.0.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum net electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Net phaseC	8.8.0.6.4.1.0.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum net electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Net phaseB	8.8.0.6.4.1.0.0.0.0.0.0.0.0.64.3.38.0	billingPeriod maximum net electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Net phaseA	8.8.0.6.4.1.0.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum net electricity SecondaryMetered phaseA k w
billingMaximumMacroPeriod kW Sum none	8.8.0.6.26.1.0.0.0.0.0.0.0.0.3.38.0	billingPeriod maximum total electricity SecondaryMetered k w
billingMaximumMacroPeriod kW Sum phaseC	8.8.0.6.26.1.0.0.0.0.0.0.0.0.32.3.38.0	billingPeriod maximum total electricity SecondaryMetered phaseC k w
billingMaximumMacroPeriod kW Sum phaseB	8.8.0.6.26.1.0.0.0.0.0.0.0.0.54.3.38.0	billingPeriod maximum total electricity SecondaryMetered phaseB k w
billingMaximumMacroPeriod kW Sum phaseA	8.8.0.6.26.1.0.0.0.0.0.0.0.0.128.3.38.0	billingPeriod maximum total electricity SecondaryMetered phaseA k w

FIG. 14