



Case Number: 18-0231-EL-REN

A. Generating Facility

Name of Renewable Generating Facility: Gallia Academy

The name specified will appear on the facility's certificate of eligibility issued by the Public Utilities Commission of Ohio.

Facility Location

Street Address: 2855 Centenary Rd.

City: Gallipolis **State:** OH **County:** Gallia **Zip Code:** 45631

Facility Latitude and Longitude

Latitude: 38.85 **Longitude:** -82.25

There are internet mapping tools available to determine the latitude and longitude, if you do not have this information.

If applicable, U.S. Department of Energy, Energy Information Administration Form EIA-860 Plant Name and Plant Code.

EIA-860 Plant Name:

EIA Plant Code:

B. Legal Name of the Facility Owner

Please note that the facility owner name listed will be the name that appears on the certificate.

The address provided in this section is where the certificate will be sent.

If the facility has multiple owners, please provide the following information for each on additional sheets.

Legal Name of the Facility Owner: Live Oak Banking Company

Legal Name of Facility Owner Representative: Brandon Conard

Title: Managing Member

Organization: Gallipolis Solar River, LLC

Street Address: 1350 17th Street, Suite 150

City: Denver **State:** CO **Zip Code:** 80202

Phone: 720-593-1158 **Fax:**

Email Address: brandon@solriver.com

Web Site Address (if applicable): www.solriver.com

C. List the name, address, telephone number and web site address under which the Applicant will do business in Ohio

Legal Name of Facility Owner Representative: Brandon Conard

Title: Managing Member

Organization: Gallipolis Solar River, LLC

Street Address: 1350 17th Street, Suite 150

City: Denver **State:** CO **Zip Code:** 80202

Phone: 720-593-1158 **Fax:**

Email Address: brandon@solriver.com

Web Site Address (if applicable): www.solriver.com

D. Name of Generation Facility Operating Company

Name of Generation Facility Operating Company: Gallipolis Solar River LLC

Legal Name of Contact Person: Brandon Conard

Title: Managing Member

Organization: Gallipolis Solar River LLC

Street Address: 1350 17th Street, Suite 150

City: Denver **State:** CO **Zip Code:** 80202

Phone: 7205931158 **Fax:**

Email Address: brandon@solriver.com

Web Site Address (if applicable): www.solriver.com

E. Regulatory/Emergency Contact

Legal Name of Contact Person: Brandon Conard

Title: Managing Partner

Organization: SolRiver, LLC

Street Address: 1350 17th Street, Suite 150

City: Denver **State:** CO **Zip Code:** 80202

Phone: 720-593-1158 **Fax:**

Email Address: brandon@solriver.com

Web Site Address (if applicable): www.solriver.com

F. Certification Criteria 1: Deliverability of the Generation into Ohio

Ohio Revised Code (ORC) Sec. 4928.64(B)(3)

The facility must have an interconnection with an electric utility.

Check which of the following applies to the facility's location:

Yes The facility is located in Ohio.

No The facility is located in a state geographically contiguous to Ohio (IN, KY, MI, PA, WV).

No The facility is located in the following state:

(If the renewable energy resource generation facility is not located in Ohio, Indiana, Kentucky, Michigan, Pennsylvania, or West Virginia, you are required to submit a POWER FLOW study by one of the regional transmission organizations (RTO) operating in Ohio, either PJM or Midwest ISO, demonstrating that the power from the facility is physically deliverable into the state of Ohio. This study must be appended to the application as an exhibit. THE FACILITY MUST BE INTERCONNECTED TO TRANSMISSION LINES. FOR ADDITIONAL INFORMATION ON DELIVERABILITY REQUIREMENTS, PLEASE REFER TO THE COMMISSION FINDING & ORDER of 3/23/11 IN CASE NO. 09-555-EL-REN.)

G. Certification Criteria 2: Qualified Resource or Technology

You should provide information for only one resource or technology on this application; please check and/or fill out only one of the sections below. If you are applying for more than one resource or technology, you will need to complete a separate application for each resource or technology.

G.1. For the resource or technology you identify in Sections G.4 - G.13 below, please provide a written description of the system.

Gallia Academy is a fixed-tilt groundmounted solar photovoltaic (PV) system. The system is comprised of the following materials:

The solar PV modules are:

Canadian Solar CS6U 320W module x 2,880 panels = 921.6 kW DC

The DC to AC inverters are:

Solectria PVI 36TL (480V) x 20 inverters = 720 kW AC

The inverters convert the DC panel output to AC electricity and the system feeds into a (1) remote meter and (2) directly into the Gallia Academy High School.

G.2. Please include a detailed description of how the output of the facility is going to be measured and verified, including the configuration of the meter(s) and the meter type(s).

There are two communication enclosures, each with a revenue grade meter. Monitoring is provided by Also Energy.

Each Communication Enclosure is 16"x16"x18" and consists of:

- Control Power Terminal Blocks
- 24VDC Power & Data Terminal Blocks
- 120-277VAC/24VDC Power Supply
- Also Energy Data Logger
- RV50 4G Cell Modem/Router with Ethernet Switch
- Elkor Mark II Meter connected to Elkor i-Block

G.3. Please submit digital photographs that depict an accurate characterization of the renewable generating facility. Please indicate the date(s) the photographs were taken. For existing facilities, these photographs must be submitted for your application to be reviewed. For proposed facilities or those under construction, photographs will be required to be filed within 30 days of the on-line date of the facility.



December 21, 2017



The Applicant is applying for certification in Ohio for a facility using one of the following qualified resources or technologies (Sec. 4928.01 ORC):

G.4 SOLAR PHOTOVOLTAIC

G.4a Location of the PV Array: Ground
Description:

G.4b Total number of Modules: 2880

G.4.1 PV Modules

For each PV module, provide the following information:

G.4.1.a Manufacturer: Canadian Solar

G.4.1.b Model and Rating: CS6U 320W

H. Certification Criteria 3: Placed-in-Service Date (Sec. 4928.64. (A)(1) O.R.C.)

The Renewable Energy Facility:

No has a placed-in-service date before January 1, 1998; Date:

Yes has a placed-in-service date on or after January 1, 1998; Date: 1/5/18

No has been modified or retrofitted on or after January 1, 1998; Date:

Please provide a detailed description of the modifications or retrofits made to the facility that rendered it eligible for consideration as a qualified renewable energy resource. In your description, please include the date of initial operation and the date of modification or retrofit to use a qualified renewable resource. Please include this description as an exhibit attached to your application filing and identify the subject matter in the heading of the exhibit.

No Not yet online; projected in-service date:

H.1 Is the renewable energy facility owner a mercantile customer? No

ORC Sec. 4928.01 (19) "Mercantile customer" means a commercial or industrial customer if the electricity consumed is for nonresidential use and the customer consumes more than seven hundred thousand kilowatt hours per year or is part of a national account involving multiple facilities in one or more states.

Has the mercantile customer facility owner committed to integrate the resource under the provisions of Rule 4901:1-39-08 O.A.C? No

If yes, please insert/submit a copy of your approved application as an exhibit to this filing.

I. Facility Information

I.a The nameplate capacity of the entire facility kilowatts (kW): 921.60 (megawatts (MW): 0.9216)

I.b If applicable, what is the expected heat rate of resource used per kWh of net generation:
BTU/kWh

I.1 For each generating unit, provide the following information:

<u>Unit In-Service Date</u>	<u>Unit Nameplate</u>	<u>Projected Gross</u>	<u>Expected Annual</u>	<u>Number of</u>
1/5/18	Capacity (MW) 0.9216	Annual Generation 1,261	Capacity Factor % 15.6	Generating Units 1
$\text{Capacity Factor \%} = \frac{\text{Projected Annual Generation}}{\text{Nameplate Capacity} \times 8,760} \times 100$				

J. Regional Transmission Organization Information

In which Regional Transmission Organization area is your facility located:

Yes Within Geographic Area of PJM Interconnection, L.L.C.

No Within Geographic Area of Midwest ISO

No Other (specify):

K. Attribute Tracking System Information

Are you currently registered with an attribute tracking system: Yes

In which attribute tracking system are you currently registered or in which do you intend to register (*the tracking system you identify will be the system the PUCO contacts with your eligibility certification*):

Yes GATS (Generation Attribute Tracking System)

No M-RETS (Midwest Renewable Energy Tracking System)

Other (specify):

K.1 Enter the generation ID number you have been assigned by the tracking system: NON217675

(If the generation ID number has not yet been assigned, you will need to file this number in the PUCO Case Docket within 15 days of the facility receiving this number from the tracking system).

K.2 Has any of the generation of the facility been tracked as RECS that have been sold or otherwise consumed? No

L. Other State Certification

Is the facility certified by another state as an eligible generating resource to meet the renewable portfolio standards of that state? No

L.1 If yes, for each state, provide the following information:

<u>Name of State</u>	<u>State Certification Agency</u>	<u>State Certification Number</u>	<u>Certification Date Issued</u>
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M. Type of Generating Facility

Please check all of the following that apply to the facility:

- No Utility Generating Facility:
- No Investor Owned Utility
- No Rural Electric Cooperative
- No Municipal System
- No Electric Services Company (competitive retail electric service provider certified by the PUCO)
- Yes Distributed Generation with a net metering and interconnection agreement with a utility.
Identify the Utility: Ohio Power Company
- No Distributed Generation with both on-site use and wholesale sales.
Identify the Utility:
- No Distributed Generation, interconnected without net metering.
Identify the Utility:
-

N. Meter Specifications

Metering Requirements

- 1. If the renewable energy resource generating facility is 6 kW or below, the output may be measured with either an inverter meter or a utility grade meter.*
- 2. All facilities that are larger than 6 kW must measure the output of the facility with a utility grade meter. Facilities that are larger than 6 kW and that are not measuring output with a utility grade meter will not be certified. OAC 4901:1-40-04 (D)(1)*
- 3. Please only report on the meter or the meters used to measure the output from the facility which will be reported to the attribute tracking system.*

N.a The meter(s) that are measuring output from the facility are:

No Inverter Meter(s)

Yes Utility Grade Meter(s) (Must meet ANSI 12.1, or demonstrate an accuracy level of $\pm 2\%$)

N.1 Please provide the following information for each meter used in your system.

N.1.a Manufacturer: Elkor

N.1.b Serial Number: 12730

N.1.c Type: Elkor WattsOn Mark II Model No. 19761


N.1.d Date of Last Certification: January 05, 2018

Attach a photograph of the meter(s) with date image taken. The meter reading(s) must be clearly visible in the photograph.

N.1.e Report the total meter reading number at the time the photograph was taken and specify the appropriate unit of generation (e.g., kWh): 138659.047

4/19/2018 12:00:00AM

PowerTrack



Tasks

Help

bconard

Global

Status

SolRiver Capital Gallia Academy Elkor Production Meter (Main)

Top-Level Alerts

Top-Level Map

Top-Level Portfolio

Top-Level Rule Tool

Status

Hardware

Alerts

Charts

Rule Tool

More Views...

DECK Site

MiniSite

Portal Site

Add New...

Hardware

Status

Alert Triggers

Charts

Configuration

Notes

More Views...

Last Communication 4/19/2018, 12:34:19 PM Last Attempt 4/19/2018, 12:34:27 PM

Basic Advanced Config

Registers: Basic

Name	Value	Units
Apparent power	363.514	KVA
Average current	418.555	A
Average voltage L-L	501.517	V
Average voltage L-N	289.611	V
Export energy	761.379	kWh
Import energy	139420.469	kWh
Power factor	0.999	
Reactive power	0.458	KVAR
Real power	363.084	KW
Total energy	138659.047	kWh



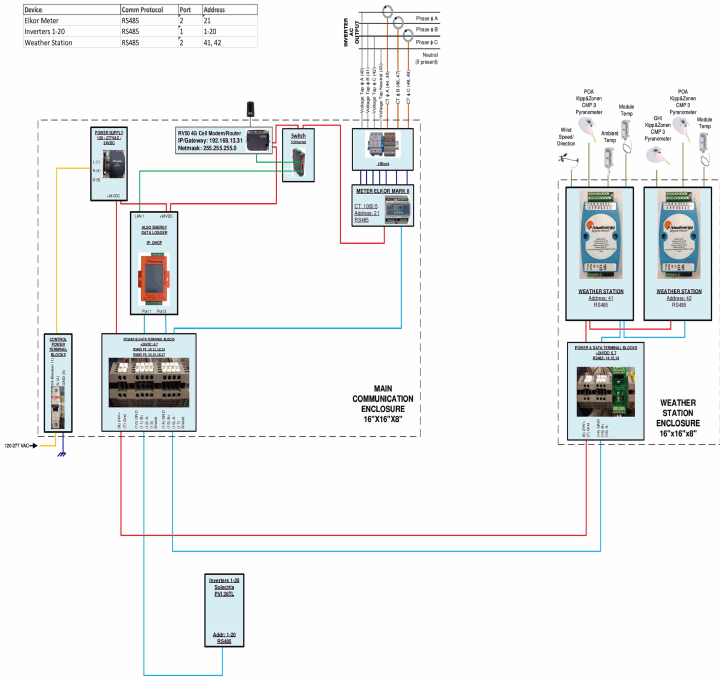
This system has been designed to AlsoEnergy specifications. If you make any modifications, the system will not work unless you notify AlsoEnergy with the changes.

Installation Manual Page Numbers	
Communication Enclosure	13
Data Logger	14
Power Supply	15
Terminal Blocks	19
Meter	21-28
Weather Station	29-36
Inverter	Inv Supplement Doc

Wiring Legend	
	Fiber (See Notes)
	Ethernet (See Notes)
	RS-485 (See Notes)
	12V Power
	24V Power
	AC Power
	Voltage Tap
	Current Transformers (CT)
	Weather station Sensors
	Pulse/Dry Contact
	Proprietary Connect

Date	Initial	Notes
5/22/2017	PWH	Drafted

Device	Comm Protocol	Port	Address
Elster Meter	RS485	2	21
Inverters 1-20	RS485	1	1-20
Weather Station	RS485	2	41, 42



NOTES

1. Internal devices (Power supply, Data Logger, Meter and RS-485 Port Card Surge Suppressors) supplied pre-wired with IP addressing set from Also Energy.
2. The RS-485 bus uses daisy-chained configuration for all devices, i.e. no more than two wires on any terminal.
3. For RS-485 connections, only connect the drain wire of the shielded cable at one end. Do not ground the drain wire at both ends of a cable run.
4. Use Belden 3106A or equivalent for all RS-485 type connections. 4000ft max length per bus, 1000ft max between each device.
5. Use Belden 7919A CAT5e Network Cable or equivalent for all hub to cable modem to gateway Ethernet connections. 300ft max
6. ALL WORK SHALL COMPLY WITH THE CURRENT NEC.
7. Fiber cable should be multi-mode 50/125µm or 62.5/125µm with SC Connectors (pre-terminated with pull ring suggested for ease of install)
8. Radio connections must be line of sight.

ALSO ENERGY INC BOULDER, CO 80301 +1.866.303.5668 WWW.ALSOENERGY.COM	TMI Electrical Solutions Gallia Academy			
	ALSO ENERGY INVERTER AND METER INTERCONNECTS			
5/22/2017	SIZE D	FSCM NO	DWG NO OL-1 ALSO ENERGY	REV 1
	SCALE	N/A	SHEET	1 OF 1

ELKOR**WATTSON® -MARK II****PRECISION ENERGY METER**

The WattsOn-Mark II Precision Energy Meter uses cutting-edge metering technology to provide unprecedented accuracy, resolution and metering performance for any electrical installation. WattsOn monitors each phase individually and incorporates the functions of single-phase, split-phase, and three-phase meters.

FEATURES:

- ◆ ANSI C12.20 Class 0.2 Accuracy Compliant, Four-Quadrant
- ◆ California CSI PBI Eligible
- ◆ High-Resolution Power and Energy measurements
- ◆ Fast update (100ms) for all power readings
- ◆ Per phase instantaneous and accumulated data
- ◆ Ultra-High Dynamic Range simplifies CT options
- ◆ Compatible with mV, mA, 5A and Rogowski Coil Inputs
- ◆ Digital communication via RS-485 (Modbus/RTU or BACnet MS/TP)
- ◆ Customizable Modbus Register Map
- ◆ Compatible with common Solar Industry Modbus Specifications
- ◆ Alarm / Pulse Outputs
- ◆ DIN and wall-mount enclosure
- ◆ Optional Display with Datalogging and Real-Time Clock
- ◆ Optional Ethernet with Modbus/TCP, BACnet/IP or web server with user configurable POST capability

**PRODUCT DESCRIPTION:**

The WattsOn-Mark II Precision Energy Meter utilizes advanced metering technology to implement a multi-function power and energy meter into a small, cost-effective package. WattsOn-Mark II provides a unique solution for monitoring virtually any wiring installation including single phase, split phase and three phase loads. It accepts up to 600V (line-to-line) directly, without the need for potential transformers. It may be configured for use with industry standard 5A CTs, 333mV CTs, mA CTs (such as Elkor's line of "safe" mA split and solid core CTs) or Rogowski Coil flexible CTs.

The WattsOn-Mark II offers full four-quadrant metering. All parameters are metered and accumulated on a per-phase basis. Instantaneous power (W, VA, VAR) feature a high update rate (100ms), other parameters are updated every 500ms. The high sampling rate, true-RMS inputs may be used even with distorted waveforms, such as those generated by variable frequency drives and SCR loads, up to the 30th harmonic.

The meter provides comprehensive per phase data, including Volts, Amps, Real Power, Reactive Power, Apparent Power, Voltage Angle, Power Factor and Frequency, Quadrant, Import/Export/Net Wh/VAh and per Quadrant VARh.

All models include Ultra-High Resolution and Dynamic Range. This feature allows mA input meters to be user configured and no longer requires the CT model and ratio to be specified at the time of ordering, simplifying meter and CT selection. The wide dynamic range of the current inputs ensures high accuracy and resolution even at very low measurements. Precise CT ratios and phase compensation may be field programmed for ultimate accuracy. Additionally, the meter may be configured with individual CT ratios per-phase, allowing for metering asymmetrical loads such as individual building branch circuits.

Measurements are available via the RS-485 output port (Modbus/RTU or BACnet MS/TP). In addition, two solid-state relay outputs are provided and may be software configured for pulse, status or alarm triggers, on any measured parameter. An on-board graphic LCD display, real-time clock and data logging are available as an option.

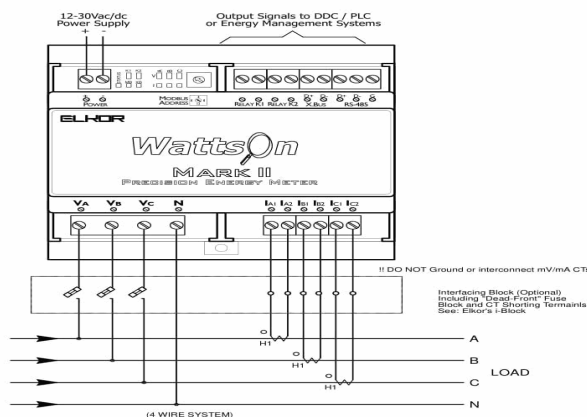
The meter may be optionally equipped with an integrated BACnet/IP gateway, or an ETnet (Ethernet module providing Modbus/TCP, web server, as well as HTTP post capability).

ELKOR Technologies Inc.**www.elkor.net****tel.519.652.9959****fax.519.652.1057****PRECISION. INNOVATION. ENGINEERED.**

ELKOR**WATTSON® -MARK II**

SPECIFICATIONS:			
INPUTS			
Power Supply	12-30 VDC or 24 VAC, < 2VA		
Supported Wiring Types	Up to 347/600V Delta, Wye Single-phase installations up to 347V RMS Split-phase (two phase) installations		
Frequency	40-70 Hz nominal (30-300 Hz max)		
Voltage	20Vac - 347Vac L-N (600Vac L-L), (450Vac L-N, 780V L-L absolute max.)		
Current	-5A Model	-mA Model	-mV Model
Input Rating	5A nominal via 5A output CTs (10A max)	200mA via mA CTs (ie: Elkor "Safe" mA output CTs)	333mV output CTs (400mV max)
Input Impedance	0.05Ω max	1.5Ω typ	800kΩ min, 1.2MΩ typical
Wire Size	Voltage: AWG 30-12, (AWG 16-22 recommended) Current: AWG 24-12, (AWG 12-16 recommended for 5A CTs)		
Overload	20% continuous (voltage & current) maintaining full accuracy. 100% momentary current overload.		
OUTPUTS			
Modbus/RTU	RS-485 2-wire, 9600 to 230400 baud (-M1 Models)		
BACnet MS/TP	RS-485 2-wire, 9600 to 115200 baud (-M2 Models)		
Expansion Bus	RS-485 2-wire, for accessory expansion		
Relay	2x Solid-State Relay Outputs (100 mA @ 50V max) User Programmable for alarm, status or pulse output		
Indicators	LED indication of: Voltage, Current, Power, Output relay state, Status, Communication		
Display (Option)	Back-lit Graphic LCD Display 128x32 (-DL models only)		
Ethernet (Option)	Ethernet module (integrated) featuring Modbus/TCP, Webserver, HTTP POST, SSL		
BACnet/IP (Option)	ETBAC module (integrated) featuring BACnet/IP connectivity		
ACCURACY			
Standards	ANSI C12.20 Class 0.2 Accuracy Certified Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.		
Current (A)	0.05% typ	0.1% max	
Voltage, L-N (V)	0.1% typ	0.2% max	
Voltage, L-L (V)	0.2% typ	0.3% max	
Power (W, VA, VAR)	0.1% typ	0.2% max	
Energy	0.1% typ	0.2% max	
Power Factor	0.2% max		
Frequency	0.01% max		
Input Bandwidth	2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)		
Data Update Frequency	10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters		
MECHANICAL			
Dimensions	4.2" x 4.3" x 2.4" W x L x H		
Mass	0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)		
Mounting	DIN Rail Mount 3-point screw wall mount		
ENVIRONMENTAL (Protected Installation)			
Operating Temperature	-40°C to +70°C		
Storage Temperature	-40°C to +70°C		
Humidity	10 to 90% non-condensing		
COMPLIANCE			
Safety	UL Listed (#E250395)		
Isolation	3,500VAC (min) input-to-output		
Electromagnetic Emissions	FCC part 15 Class B		

TYPICAL WIRING:



MEASURED PARAMETERS (available via Modbus)

Voltage [V] (A, B, C, Avg, AB, AC, BC, Avg)
 Current [A] (A, B, C, Avg)
 Active Power [W] (A, B, C, Total) — Bi-directional
 Apparent Power [VA] (A, B, C, Total)
 Reactive Power [VAR] (A, B, C, Total) — Bi-directional
 Power Factor (A, B, C, System) — Bi-directional
 Active Quadrant (A, B, C, System)
 Voltage Phase Angle [°] (AB, AC, BC)
 Frequency [Hz]
 Import/Export/Net Real Energy [Wh] (A, B, C, Total)
 Import/Export/Net Apparent Energy [VAh] (A, B, C, Total)
 Q1/Q2/Q3/Q4 Reactive Energy [VARh] (A, B, C, Total)
 Total Demand Power (Sliding Window) [W]

All parameters are accessible as integer and floating point format.

ORDERING INFORMATION

W2- [1] - [2] - [3]

[1] Specifies Model:
M1 = RS-485 + 2 x Pulse (Modbus/RTU)
M2 = RS-485 + 2 x Pulse (BACnet MS/TP)
M3 = BACnet/IP module + 2 x Pulse
M4 = Ethernet (ETnet) + 2 x Pulse

[2] Specifies CT Input Type:
5A = Inputs for 5A CTs
mA = Inputs for mA output CTs (up to 200mA)
333mV = Inputs for 333mV output CTs
RC = Inputs for Rogowski Coil (up to 300mV)

[3] Specifies Display/Logging Module (optional):
DL = Integrated Display AND Logging Module

Examples:

W2-M1-mA-DL: RS-485, mA inputs, no logging or display
W2-M3-mA-DL: Integrated ETnet, mA inputs, Logging/Display module

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www.elkor.net tel.519.652.9959 fax.519.652.1057

N.a The meter(s) that are measuring output from the facility are:

No Inverter Meter(s)

Yes Utility Grade Meter(s) (Must meet ANSI 12.1, or demonstrate an accuracy level of $\pm 2\%$)

N.1 Please provide the following information for each meter used in your system.

N.1.a Manufacturer: Elkor

N.1.b Serial Number: 12730


N.1.c Type: Elkor WattsOn Mark II Model No. 19761

N.1.d Date of Last Certification: January 05, 2018

Attach a photograph of the meter(s) with date image taken. The meter reading(s) must be clearly visible in the photograph.

N.1.e Report the total meter reading number at the time the photograph was taken and specify the appropriate unit of generation (e.g., kWh): 138331.984

PowerTrack



Tasks

Help

bconard

Global

Status

SolRiver Capital

Gallia Academy

Elkor Production Meter (Remote)

Top-Level Alerts

Top-Level Map

Top-Level Portfolio

Top-Level Rule Tool

Site

Status

Hardware

Alerts

Charts

Rule Tool

More Views...

DECK Site

MiniSite

Portal Site

Add New...

Hardware

Status

Alert Triggers

Charts

Configuration

Notes

More Views...

Last Communication 4/19/2018, 12:49:09 PM

Last Attempt 4/19/2018, 12:49:21 PM

Basic | Advanced | Config

Registers: Basic

Name	Value	Units
Apparent power	122.663	kVA
Average current	144.012	A
Average voltage L-L	491.747	V
Average voltage L-N	283.827	V
Export energy	726.574	kWh
Import energy	139058.563	kWh
Power factor	-0.997	
Reactive power	-0.458	kVAR
Real power	122.307	kW
Total energy	138331.984	kWh



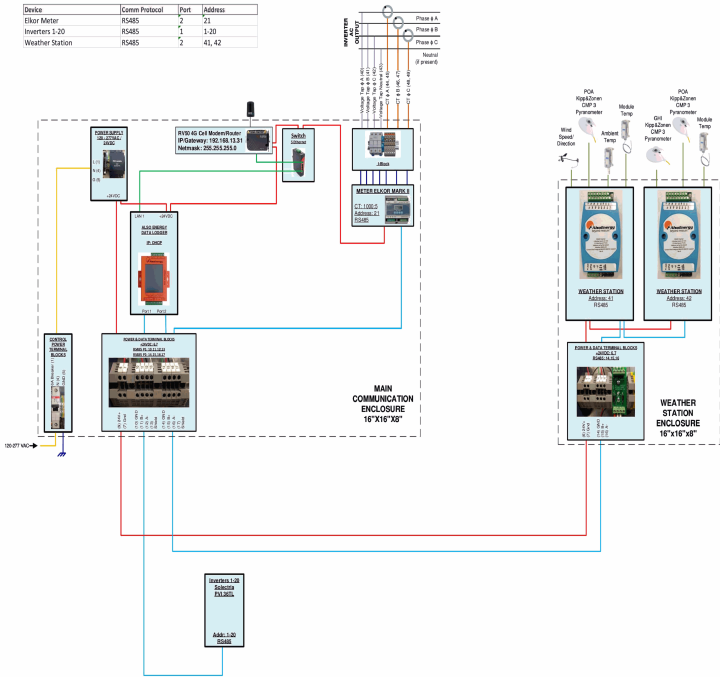
This system has been designed to AlsoEnergy specifications. If you make any modifications, the system will not work unless you notify AlsoEnergy with the changes.

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Meter	21-28
Weather Station	29-36
Inverter	Inv Supplement Doc

Wiring Legend	
	Fiber (See Notes)
	Ethernet (See Notes)
	RS-485 (See Notes)
	12V Power
	24V Power
	AC Power
	Voltage Tap
	Current Transformers (CT)
	Weather station Sensors
	Pulse/Dry Contact
	Proprietary Connect

Date	Initial	Notes
5/22/2017	PWH	Drafted

Device	Comm Protocol	Port	Address
Elster Meter	RS485	2	21
Inverters 1-20	RS485	1	1-20
Weather Station	RS485	2	41, 42



NOTES

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6. ALL WORK SHALL COMPLY WITH THE CURRENT NEC.
7. Fiber cable should be multi-mode 50/125µm or 62.5/125µm with SC Connectors (pre-terminated with pull ring suggested for ease of install)
8. Radio connections must be line of sight.

ALSO ENERGY INC BOULDER, CO 80301 +1.866.303.5668 WWW.ALSOENERGY.COM	TMI Electrical Solutions Gallia Academy			
	ALSO ENERGY INVERTER AND METER INTERCONNECTS			
5/22/2017	SIZE	FSCM NO	DWG NO	REV
	D		OL-1 ALSO ENERGY	1
	SCALE	N/A	SHEET	1 OF 1

ELKOR**WATTSON® - MARK II****PRECISION ENERGY METER**

The WattsOn-Mark II Precision Energy Meter uses cutting-edge metering technology to provide unprecedented accuracy, resolution and metering performance for any electrical installation. WattsOn monitors each phase individually and incorporates the functions of single-phase, split-phase, and three-phase meters.

FEATURES:

- ◆ ANSI C12.20 Class 0.2 Accuracy Compliant, Four-Quadrant
- ◆ California CSI PBI Eligible
- ◆ High-Resolution Power and Energy measurements
- ◆ Fast update (100ms) for all power readings
- ◆ Per phase instantaneous and accumulated data
- ◆ Ultra-High Dynamic Range simplifies CT options
- ◆ Compatible with mV, mA, 5A and Rogowski Coil Inputs
- ◆ Digital communication via RS-485 (Modbus/RTU or BACnet MS/TP)
- ◆ Customizable Modbus Register Map
- ◆ Compatible with common Solar Industry Modbus Specifications
- ◆ Alarm / Pulse Outputs
- ◆ DIN and wall-mount enclosure
- ◆ Optional Display with Datalogging and Real-Time Clock
- ◆ Optional Ethernet with Modbus/TCP, BACnet/IP or web server with user configurable POST capability

**PRODUCT DESCRIPTION:**

The WattsOn-Mark II Precision Energy Meter utilizes advanced metering technology to implement a multi-function power and energy meter into a small, cost-effective package. WattsOn-Mark II provides a unique solution for monitoring virtually any wiring installation including single phase, split phase and three phase loads. It accepts up to 600V (line-to-line) directly, without the need for potential transformers. It may be configured for use with industry standard 5A CTs, 333mV CTs, mA CTs (such as Elkor's line of "safe" mA split and solid core CTs) or Rogowski Coil flexible CTs.

The WattsOn-Mark II offers full four-quadrant metering. All parameters are metered and accumulated on a per-phase basis. Instantaneous power (W, VA, VAR) feature a high update rate (100ms), other parameters are updated every 500ms. The high sampling rate, true-RMS inputs may be used even with distorted waveforms, such as those generated by variable frequency drives and SCR loads, up to the 30th harmonic.

The meter provides comprehensive per phase data, including Volts, Amps, Real Power, Reactive Power, Apparent Power, Voltage Angle, Power Factor and Frequency, Quadrant, Import/Export/Net Wh/VAh and per Quadrant VARh.

All models include Ultra-High Resolution and Dynamic Range. This feature allows mA input meters to be user configured and no longer requires the CT model and ratio to be specified at the time of ordering, simplifying meter and CT selection. The wide dynamic range of the current inputs ensures high accuracy and resolution even at very low measurements. Precise CT ratios and phase compensation may be field programmed for ultimate accuracy. Additionally, the meter may be configured with individual CT ratios per-phase, allowing for metering asymmetrical loads such as individual building branch circuits.

Measurements are available via the RS-485 output port (Modbus/RTU or BACnet MS/TP). In addition, two solid-state relay outputs are provided and may be software configured for pulse, status or alarm triggers, on any measured parameter. An on-board graphic LCD display, real-time clock and data logging are available as an option.

The meter may be optionally equipped with an integrated BACnet/IP gateway, or an ETnet (Ethernet module providing Modbus/TCP, web server, as well as HTTP post capability).

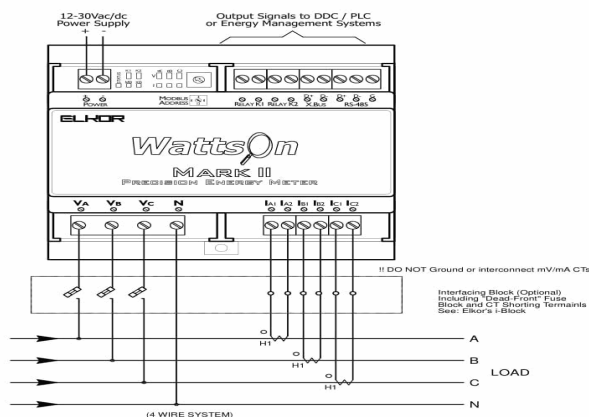
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WATTSON® -MARK II

SPECIFICATIONS:			
INPUTS			
Power Supply	12-30 VDC or 24 VAC, < 2VA		
Supported Wiring Types	Up to 347/600V Delta, Wye Single-phase installations up to 347V RMS Split-phase (two phase) installations		
Frequency	40-70 Hz nominal (30-300 Hz max)		
Voltage	20Vac - 347Vac L-N (600Vac L-L), (450Vac L-N, 780V L-L absolute max.)		
Current	-5A Model	-mA Model	-mV Model
Input Rating	5A nominal via 5A output CTs (10A max)	200mA via mA CTs (ie: Elkor "Safe" mA output CTs)	333mV output CTs (400mV max)
Input Impedance	0.05Ω max	1.5Ω typ	800kΩ min, 1.2MΩ typical
Wire Size	Voltage: AWG 30-12, (AWG 16-22 recommended) Current: AWG 24-12, (AWG 12-16 recommended for 5A CTs)		
Overload	20% continuous (voltage & current) maintaining full accuracy. 100% momentary current overload.		
OUTPUTS			
Modbus/RTU	RS-485 2-wire, 9600 to 230400 baud (-M1 Models)		
BACnet MS/TP	RS-485 2-wire, 9600 to 115200 baud (-M2 Models)		
Expansion Bus	RS-485 2-wire, for accessory expansion		
Relay	2x Solid-State Relay Outputs (100 mA @ 50V max) User Programmable for alarm, status or pulse output		
Indicators	LED indication of: Voltage, Current, Power, Output relay state, Status, communication		
Display (Option)	Back-lit Graphic LCD Display 128x32 (-DL models only)		
Ethernet (Option)	Ethernet module (integrated) featuring Modbus/TCP, Webserver, HTTP POST, SSL		
BACnet/IP (Option)	ETBAC module (integrated) featuring BACnet/IP connectivity		
ACCURACY			
Standards	ANSI C12.20 Class 0.2 Accuracy Certified Supports EN 50470-1, EN 50470-3, IEC 62053-21, IEC 62053-22, and IEC 62053-23 standards.		
Current (A)	0.05% typ	0.1% max	
Voltage, L-N (V)	0.1% typ	0.2% max	
Voltage, L-L (V)	0.2% typ	0.3% max	
Power (W, VA, VAR)	0.1% typ	0.2% max	
Energy	0.1% typ	0.2% max	
Power Factor	0.2% max		
Frequency	0.01% max		
Input Bandwidth	2 kHz (33rd Harmonic @ 60Hz, 40th Harmonic @ 50Hz)		
Data Update Frequency	10Hz (every 100ms) for instantaneous W, VA, VAR 2Hz (every 500ms) for all other parameters		
MECHANICAL			
Dimensions	4.2" x 4.3" x 2.4" W x L x H		
Mass	0.15 kg (-mA and -mV models) 0.23 kg (-5A-DL model)		
Mounting	DIN Rail Mount 3-point screw wall mount		
ENVIRONMENTAL (Protected Installation)			
Operating Temperature	-40°C to +70°C		
Storage Temperature	-40°C to +70°C		
Humidity	10 to 90% non-condensing		
COMPLIANCE			
Safety	UL Listed (#E250395)		
Isolation	3,500VAC (min) input-to-output		
Electromagnetic Emissions	FCC part 15 Class B		

TYPICAL WIRING:



MEASURED PARAMETERS (available via Modbus)

Voltage [V] (A, B, C, Avg, AB, AC, BC, Avg)
Current [A] (A, B, C, Avg)
Active Power [W] (A, B, C, Total) — Bi-directional
Apparent Power [VA] (A, B, C, Total)
Reactive Power [VAR] (A, B, C, Total) — Bi-directional
Power Factor (A, B, C, System) — Bi-directional
Active Quadrant (A, B, C, System)
Voltage Phase Angle [°] (AB, AC, BC)
Frequency [Hz]
Import/Export/Net Real Energy [Wh] (A, B, C, Total)
Import/Export/Net Apparent Energy [VAh] (A, B, C, Total)
Q1/Q2/Q3/Q4 Reactive Energy [VARh] (A, B, C, Total)
Total Demand Power (Sliding Window) [W]

All parameters are accessible as integer and floating point format.

ORDERING INFORMATION

W2- [1] - [2] - [3]

[1] Specifies Model:
M1 = RS-485 + 2 x Pulse (Modbus/RTU)
M2 = RS-485 + 2 x Pulse (BACnet MS/TP)
M3 = BACnet/IP module + 2 x Pulse
M4 = Ethernet (Ethernet) + 2 x Pulse

[2] Specifies CT Input Type:
5A = Inputs for 5A CTs
mA = Inputs for mA output CTs (up to 200mA)
333mV = Inputs for 333mV output CTs
RC = Inputs for Rogowski Coil (up to 300mV)

[3] Specifies Display/Logging Module (optional):
DL = Integrated Display AND Logging Module

Examples:

W2-M1-mA: RS-485, mA inputs, no logging or display
W2-M3-mA-DL: Integrated Ethernet, mA inputs, Logging/Display module

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Public Utilities Commission

Affidavit for Application for Certification as an Eligible Ohio Renewable Energy Resource Generating Facility

Please be advised that all applicant's contact information, including address and telephone number, will be made public and is not subject to confidential treatment. Additionally, any information pertaining to trade secrets contained within the application will be made public unless filed under seal with a motion for protective order, pursuant to Rule 4901-1-24 of the Ohio Administrative Code.

Case Number: 18-0231-EL-REN

Facility Address: 2855 Centenary Rd.
Gallipolis, OH 45631

Name of person making this affidavit: Brandon Conard

State of Colorado

County of Denver

The undersigned, being duly sworn according to law, deposes and says that:

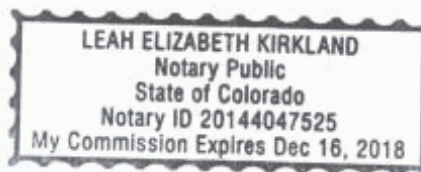
1. I am authorized to and do hereby make this affidavit on behalf of the Applicant.
2. All facts and statements made in the application for certification, including all attachments and supplemental information or filings, are true and complete to the best of my knowledge, information, and belief.
3. The facility has obtained or will obtain and will maintain all required local, state, and federal environmental permits.
4. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.


_____, Managing Partner - SolRiver, LLC
Signature of Affiant & Title

Sworn and subscribed before me this 23rd day of APRIL, 2018 Month/Year



Notary
My commission expires on DEC. 16, 2018



The Public Utilities Commission of Ohio reserves the right to verify the accuracy of the data reported to the tracking system and to the PUCO.

Version: June 3, 2013

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

4/23/2018 4:13:32 PM

in

Case No(s). 18-0231-EL-REN

Summary: Application EL-REN Application for Gallia Academy solar PV system. electronically filed by Mr. Brandon Conard on behalf of Mr. Brandon Conard and Gallipolis Solar River LLC