



# **The NSSP Approved GreenMeter Specifications**



**The Green Box Solution Pty Ltd**  
**Experience and Innovation**



# The GreenBox Solution

Working Smarter

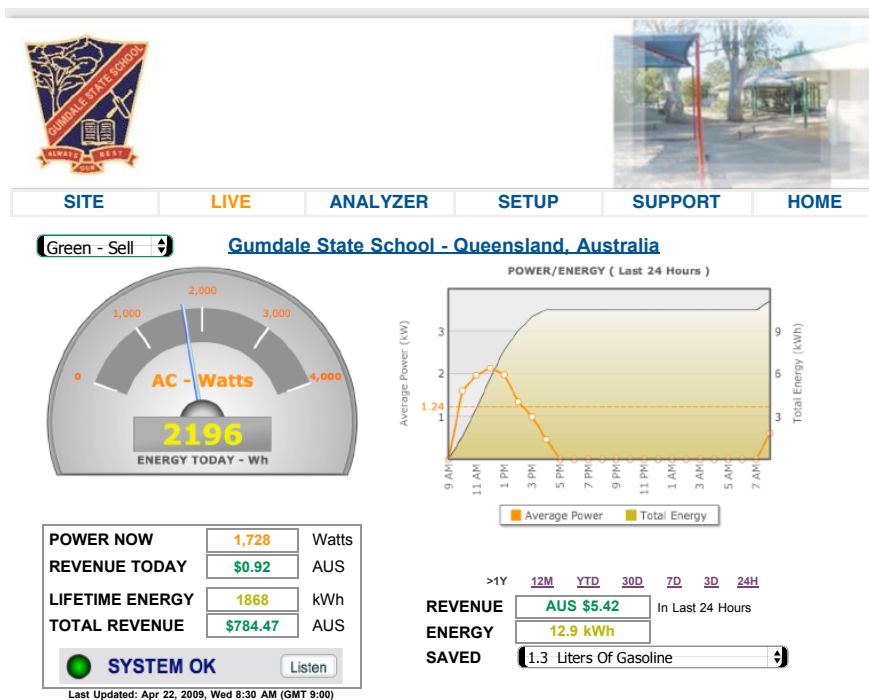
Saving Energy... Saving Money

## A PROJECT SOLUTION

for the

NSSP Green and Black Power

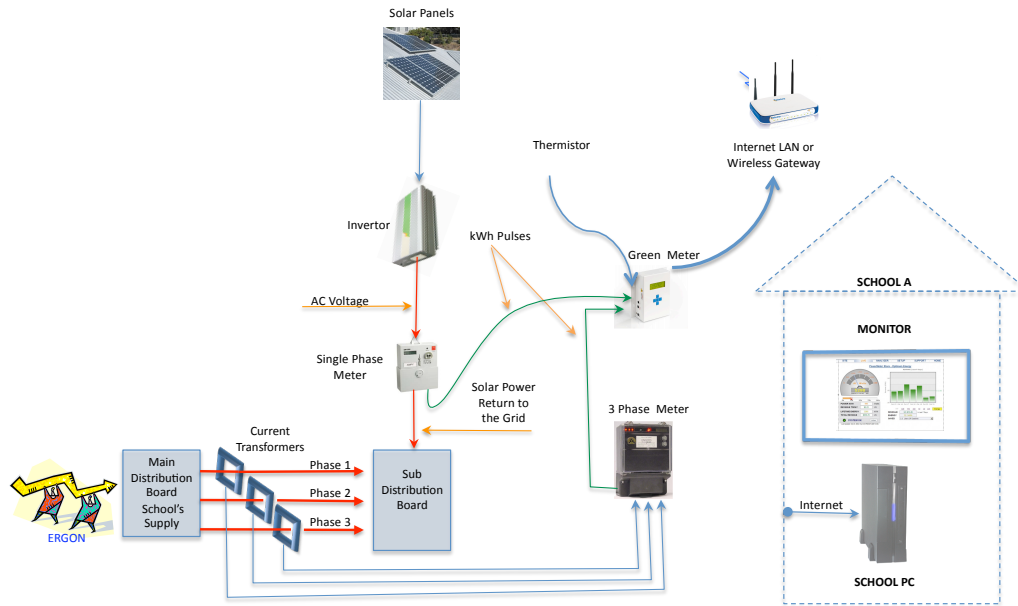
Data Collection and Visualisation



HELP

## How the Solution Works?

### Green Box Solutions Basic Wiring Diagram



The easy to install Green Box Solution system is an energy management system that offers useful intelligence, convenience and knowledge about your renewable energy investment and black power energy use.

The supplied Split Core Current Transformers (CTs), sense the school's Grid or Black Energy usage and the 3 phase meter (supplied) delivers a programmable 400 millisecond pulse every 1 kWh to the GBSWebMeter (supplied) for data collection via the internet to a personalized website (see <http://icpgm210052.solarvu.net/green/solarVuLive.php?ac=icpgm210052>). The solar energy is measured by the (supplied) single-phase meter and a pulse is delivered every 10 WHrs to the GBSWebMeter for display on the website. A Thermistor (supplied) measures the ambient temperature and is wired back to the GBSWebMeter.

The GBSWebMeter, a device in the system, can operate as a stand-alone unit or with a Web browser based software program. You can get additional computer based functionality and up to 7 days of data logging. The GBSWebMeter updates the data collection every 30 minutes and the controller checks for firmware updates every 2 hours.

### KEY BENEFITS AND FEATURES

- Easy to install, DIN rail mounted devices
- Simplicity of devices
- Monitors Solar energy, Grid energy, Temperature, Wind, Irradiance, simultaneously
- Web based monitoring service and a personalized web page
- Data history and graphing
- Cost savings tracking and graphing
- Up to the minute Greenhouse gas emissions, tracking and graphing
- kWh tracking and graphing
- Financial analysis tools for investment, revenue and payback period
- Greenhouse gas saving tools that describes your Carbon Footprint
- Ongoing Technical Support
- Daily email reports on performance
- 12 months warranty on all devices
- NSSP Approved devices

## THE GREEN BOX SOLUTIONS NSSP SCHOOL METERING CONFIGURATIONS

Green Box Solutions has developed 12 metering solutions to cover off the likely NSSP Data Collection and Visualisation scenarios.

Option	Configuration	Communication
1	School Black and Green kWh Metering on the one building wired to a GBSWebMeter. This option uses the School LAN to push data to the GreenBox Solution database and visualization system.	The GBSWebMeter is wired to the School LAN
Hard wired LAN		
1	Option 1 with a second three phase black power meter for school MSB to measure school circuits that may need to be metered separately from the school to comply with the NSSP 65% metering requirement.	The GBSWebMeter is wired to the School LAN
Hard wired LAN		
2	School Black kWh Metering on one building to meter the school electrical energy use and the Green kWh Metering on another building meter the solar power system electrical energy. Hard wiring installed from either building to the building that houses the GBSWebMeter. This option uses the School LAN to push data to the GreenBox Solution database and visualization system.	The GBSWebMeter is wired to the School LAN
Hard wired LAN		
2A	Option 2 with a second three phase black power meter for school MSB to measure school circuits that may need to be metered separately from the school to comply with the NSSP 65% metering requirement.	The GBSWebMeter is wired to the School LAN
Hard wired LAN		
3	School Black kWh Metering on one building to meter the school electrical energy use and the Green kWh Metering on another building meter the solar power system electrical energy. Hard wiring between the two buildings is not cost effective; each location will include a GBSWebMeter. This option has two separate hard-wired School LAN connections to push data to the GreenBox Solution database and visualization system.	Two GBSWebMeters wired are wired to the School LAN
Hard wired LAN		
3A	Option 3 with a second three phase black power meter for school MSB to measure school circuits that may need to be metered separately from the school to comply with the NSSP 65% metering requirement.	Two GBSWebMeters wired are wired to the School LAN
Hard wired LAN		
4	School Black Power and Green Power kWh Metering installed on the one building wired to a GBSWebMeter but these cannot hard wired School LAN connection, a Wireless Gateway is required. This option uses a Wireless Gateway to push data to the GreenBox Solution database and visualization system.	The GBSWebMeter wired to one 3G Wireless Gateway
Wireless Gateway		
4A	Option 4 with a GreenBox Digital Pulse Accumulator on the School Black Power system to add multiple kWh meters from the MSB due to school MSB layout that may be supplying other than school load such as a community facility, church or childcare centre. Green Box provides an 8 meter input counter to GBSWebMeter to resolve this issue.	The GBSWebMeter wired to one 3G Wireless Gateway
Wireless Gateway		
5	School Black kWh Metering on the one building with either the MSB or school mains supply and the Green kWh Metering on another building housing the solar array and inverter. Hard wiring installed from either building to the building that houses the GBSWebMeter. This option uses a 3G WiFi Wireless Gateway to push data to the GreenBox Solution database and visualization system.	The GBSWebMeter wired to one 3G Wireless Gateway
Wireless Gateway		
5A	Option 5 with a second three phase black power meter for school MSB to measure school circuits that may need to be metered separately from the school to comply with the NSSP 65% metering requirement.	The GBSWebMeter wired to one 3G Wireless Gateway
Wireless Gateway		
6	School Black kWh Metering on one building and the Green kWh Metering on another building. Hard wiring between the two buildings is not cost effective to achieve, and a hard wired LAN is not accessible from either WebMeter. This option uses two 3G Wireless Gateways to push data to the GreenBox Solution database and visualization system.	Two GBSWebMeters are wired to two 3G Wireless Gateway
Wireless Gateway		
6A	Option 6 with a second three phase black power meter for school MSB to measure school circuits that may need to be metered separately from the school to comply with the NSSP 65% metering requirement.	Two GBSWebMeters, three black power meters wired to two 3G Wireless Gateways
Wireless Gateway		

## THE GREEN BOX SOLUTIONS NSSP SCHOOL METERING KITS INCLUSIONS

### Configuration 1 & 2 - Inclusions

- 1 x GBSWebMeter
- 1 x Temperature sensor with 5 Meter cable
- 1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system
- 1 x Software to allow Setup of Logger from PC
- 1 x Class 1.0 One Single Phase kWh Meter
- 1 x Class 1.0 Three Phase kWh Meter
- 3 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)

### Configuration 1A - Inclusions

- 1 x GBSWebMeter
- 1 x Temperature sensor with 5 Meter cable
- 1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system
- 1 x Software CD for direct data logging to a PC
- 1 x Class 1.0 One Single Phase kWh Meter
- 2 x Class 1.0 Three Phase kWh Meter
- 6 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)

### Configuration 2A - Inclusions

- 1 x GBSWebMeter
- 1 x Temperature sensor with 5 Meter cable
- 1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system
- 1 x Software to allow Setup of Logger from PC
- 1 x Class 1.0 One Single Phase kWh Meter
- 2 x Class 1.0 Three Phase kWh Meter
- 6 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)

### Configuration 3 - Inclusions

- 2 x GBSWebMeter
- 1 x Temperature sensor with 5 Meter cable
- 1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system
- 1 x Software to allow Setup of Logger from PC
- 1 x Class 1.0 One Single Phase kWh Meter
- 1 x Three Phase kWh Meter
- 3 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)

### Configuration 3A - Inclusions

- 2 x GBSWebMeter
- 1 x Temperature sensor with 5 Meter cable
- 1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system
- 1 x Software to allow Setup of Logger from PC
- 1 x Class 1.0 One Single Phase kWh Meter
- 2 x Class 1.0 Three Phase kWh Meter
- 6 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)

### Configuration 4 & 5 - Inclusions

- 1 x GBSWebMeter
- 1 x Temperature sensor with 5 Meter cable
- 1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system
- 1 x Software to allow Setup of Logger from PC
- 1 x Class 1.0 One Single Phase kWh Meter
- 1 x Class 1.0 Three Phase kWh Meter
- 3 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)
- 1 x 3G Wireless Gateway

**Configuration 4A - Inclusions**

1 x GBSWebMeter  
1 x Temperature sensor with 5 Meter cable  
1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system  
1 x Software to allow Setup of Logger from PC  
1 x Class 1.0 One Single Phase kWh Meter  
2 x Class 1.0 Three Phase kWh Meter  
6 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)  
1 x 3G Wireless Gateway

**Configuration 5A - Inclusions**

1 x GBSWebMeter  
1 x Temperature sensor with 5 Meter cable  
1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system  
1 x Software to allow Setup of Logger from PC  
1 x Class 1.0 One Single Phase kWh Meter  
2 x Class 1.0 Three Phase kWh Meter  
6 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)  
1 x 3G Wireless Gateway

**Configuration 6 - Inclusions**

2 x GBSWebMeter  
1 x Temperature sensor with 5 Meter cable  
1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system  
1 x Software to allow Setup of Logger from PC  
1 x Class 1.0 One Single Phase kWh Meter  
1 x Three Phase kWh Meter  
3 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)  
2 x 3G Wireless Gateway

**Configuration 6A - Inclusions**

2 x GBSWebMeter  
1 x Temperature sensor with 5 Meter cable  
1 x Web based monitoring service with a personalized GreenBox Solution database and visualization system  
1 x Software to allow Setup of Logger from PC  
1 x Class 1.0 One Single Phase kWh Meter  
3 x Class 1.0 Three Phase kWh Meter  
9 x 800/5 or lower split core CTs (Will be determined by the turns ratio of existing school's CTs. E.g. 100/5A Class 1)  
2 x 3G Wireless Gateway

## THE GREEN BOX SOLUTIONS NSSP SCHOOL METERING

### Installation and Cabling Required by Contractor

Item	Mounting	Interfaced With	Connection / Type	Cable
GBSWebMeter	DIN Rail Mounted	SWB 240VAC Circuit Breaker	Hard wired connection to 10 Amp Circuit Breaker.	1.5mm2 two core and earth cable multi stranded circular or TPS.
		Single Phase kWh meter	Pulse output via screw type terminals.	0.5mm2 two core shielded multi stranded circular
		Three Phase kWh meter	Pulse output via screw type terminals.	0.5mm2 two core shielded multi stranded circular
		Temperature Sensor	VDC output via screw type terminals.	5 metres of cable supplied with Thermistor supplied by GBS.
		School LAN	RJ45 Connection from GBSWebMeter to Ethernet Switch.	Cat 5 cable to School LAN and GBSWebMeter
		3G Wireless Gateway	RJ45 Connection on Gateway to GBSWebMeter GPO required for power pack.	Cat 5 cable between Wireless Gateway and GBSWebMeter
Three Phase Meter	DIN Rail Mounted	Three Split Core Current Transformers	CTs wired to Three Phase kWh meter.	1.0mm2 six core and shield cable multi stranded circular.
		GBSWebMeter	Three Phase kWh Meter wired to GBSWebMeter	0.5mm2 two core shielded cable multi stranded circular.
		SWB 240VAC Circuit Breaker	Hard wired connection to 10 Amp Circuit Breaker.	1.5mm2 two core and earth cable multi stranded circular or TPS.
Single Phase Meter	DIN Rail Mounted	Solar Power System Single Phase kWh	Screw terminals.	2.5mm2 or 4.0mm2 two core and earth cable multi stranded TPS.
		Meter Output and GBSWebMeter.	Screw terminals.	0.5mm2 two core shielded cable multi stranded circular.
Temperature Sensor	Wall Mounted	GBSWebMeter	Sensor to GBSWebMeter Screw terminals.	0.5mm2 two core shielded cable multi stranded circular.
3G Wireless Gateway	Panel Mounted	GBSWebMeter	Thermistor with pre-terminated cable	Cat 5 cable between Wireless Gateway and GBSWebMeter

# DEVICE SPECIFICATIONS

## Current Transformers

Size and Turns Ratio is determined by the school's existing CT turns ratio

## Single Phase Meter

**Manufacturer** Schneider

**Model** EN40P

**Current** 10-100A

**Voltage** 240V

**Configuration** 1p2W

**Frequency** 50Hz

**Rated Accuracy** Class 1.0

**Impulse Voltage** 10 kV

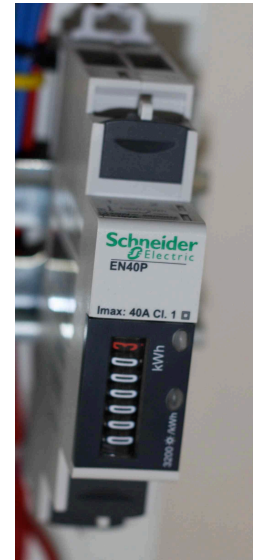
**Ambient Temperature** -20°C to +60°C

**Communication** ANSI standard optical interface

**Enclosure rating** IP53 to AS1939

**Dimensions (mm)** 1 Pole DIN Rail Mounted

**Standard** AS1284.5/IEC61036 ISO9001



## Three Phase Meter

**Manufacturer** Northern Design

**Model** ND 303

**Input** 5ACT (In =Imax) 5A – 20A

**Voltage** 96V to 300V

**Frequency** 49 to 51Hz

**Configuration** 3 element, 3phase, 4 wire

**Ambient Temperature** -20°C to +65°C

**Storage** -25°C to +75°C

**Humidity** 0 to 95%

**Rate Accuracy** Class 1.0 IEC61036/AS1284.5

**Impulse Voltage** 10kV withstand

**Communication, optical** ANSI standard optical interface

**Per phase voltage burden** 2.4VA, 0.9W(average) at 240V

**Per phase current burden** 0.06VA

**Enclosure rating** IP53 to AS1939

**Enclosure Size** 6 Pole DIN Rail Mounted

**Typical mass** 0.5kg

**Standard** AS1284.5/IEC61036 ISO9001



## **GBSWebMeter**

### Technical Specification Summary

#### **Pulse counting inputs**

- Eight DC direct coupled (non-isolated) logic inputs that respond to a connection to ground. For Green and Black Power Meters.
- Connection Inputs - External hard-wired energy meter pulse recording

#### **Low Voltage, Low Current Relay Output**

- Two normally open relays brought out as voltage free contacts. Refer to manufacturers data sheet for detailed specifications. Relay is not suitable for voltages above 24 VAC.

#### **Configurable Analogue Inputs**

- Three analog inputs. Each input can be configured to measure temperature (via external thermistor), 0– 5 VDC, 0-10 VDC and 0–20mA to suit a variety of sensor types. Thermistor, 0-5V, 0-10V or 0-20mA (jumper selectable)

#### **Non Volatile memory**

- Non volatile EEPROM memory for data storage during Internet down times and remote software upgrades.
- 1 x RJ45 Ethernet socket for full duplex 10/100 TCP/IP communication
- DIN Rail mounted product and is Internet ready
- 8 x Screw Terminals for the pulse inputs from Green Energy and Grid Energy meters
- 3 x Screw Terminals for Temperature, Irradiance and Anemometer data
- 1 x 240VAC Power Supply Connection
- Weight 0.4Kg
- 6 Pole DIN Rail Mounted

#### **GBSWebMeter Software Capabilities**

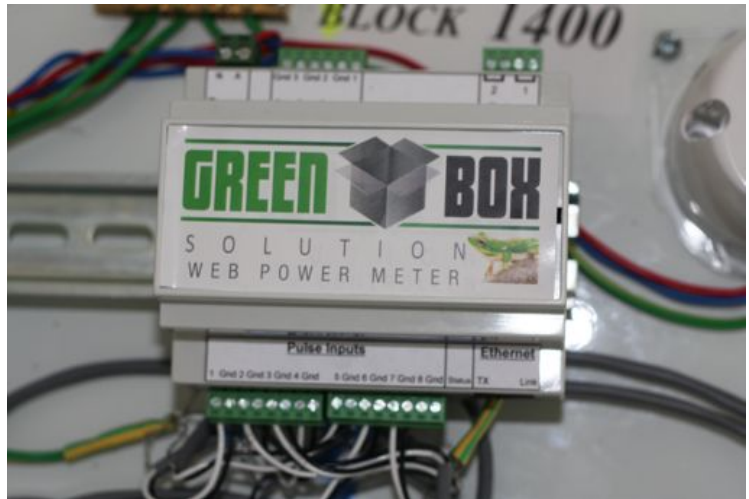
- Data capture with date/time stamp, logging, and communicating through the internet
- Data logged at 15-minute intervals all inputs
- 2 week storage on the GBSWebMeter itself or unlimited on your hard-drive or server including
- Data history and graphing
- Cost savings kWh tracking incl. Time of use
- Data Communications and presentation
- Calculates greenhouse gas emission tracking, saving, cost savings, revenue generation

#### **GBSWebMeter Networking Capabilities**

- Dedicated Web page
- Networking via Ethernet TCP/IP (RJ-45)
- Direct Computer interface via Ethernet port when on a LAN network
- Connect to any Ethernet device e.g. Gateway, Ethernet switch
- Computer application (online software updates, logging reset, setting date/time, multiplier factor, input settings) for installers and sophisticated home users

#### **Installers Requirements**

All Cabling and fixing is to be done by a fully qualified electrical and communications contractor or suitably qualified personnel.  
N.B. Cat 5 cable runs should not exceed 95 Meters.



### **The Green Box Solutions Pty Ltd**

**Phone** + 61 7 3846 0204  
**Fax** + 61 7 3036 6245  
**Email** [solutions@thegreenbox.com.au](mailto:solutions@thegreenbox.com.au)  
**Website** [www.thegreenbox.com.au](http://www.thegreenbox.com.au)

**Street**  
Unit 1/37 Cordelia Street  
South Brisbane Qld 4101  
**Postal** PO Box 5071  
West End Qld 4101

## Green Box Solutions

### NSSP Data Collection and Visualisation Solution Pricing

Configuration	Inclusions	Price Ext GST	GST	Price inc GST
1	A GBSWebMeter wired to the School LAN.	\$2,669.00	\$266.90	\$2,935.90
1A	A GBSWebMeter wired to the School LAN with a second three phase kWh meter and CTs.	\$3,341.00	\$334.10	\$3,675.10
2	A GBSWebMeter wired to the School LAN	\$2,669.00	\$266.90	\$2,935.90
2A	A GBSWebMeter wired to the School LAN with a second three phase kWh meter and CTs.	\$3,341.00	\$334.10	\$3,675.10
3	Two GBSWebMeters wired to the School LAN with one GBSWebMeter connected to the Black Power meter and the second GBSWebMeter connected to the Solar Power meter	\$3,327.00	\$332.70	\$3,659.70
3A	Two GBSWebMeters are wired to the School LAN with second GBSWebMeter, two three phase kWh meters and CTs.	\$3,999.00	\$399.90	\$4,398.90
4	A GBSWebMeter wired to one 3G Wireless Router	\$3,262.75	\$326.28	\$3,589.03
4A	A GBSWebMeter wired to one 3G Wireless Router and two three phase kWh meter and CTs.	\$3,934.75	\$393.48	\$4,328.23
5	A GBSWebMeter wired to one 3G Wireless Router	\$3,262.75	\$326.28	\$3,589.03
5A	A GBSWebMeter wired to one 3G Wireless Router with two three phase kWh meter and CTs.	\$3,934.75	\$393.48	\$4,328.23
6	Two GBSWebMeters wired to their own 3G Wireless Router with two GBSWebMeter	\$4,514.50	\$451.45	\$4,965.95
6A	Two GBSWebMeters wired to their own 3G Wireless Router with two GBSWebMeter and second three phase kWh meter and CTs.	\$5,186.50	\$518.65	\$5,705.15