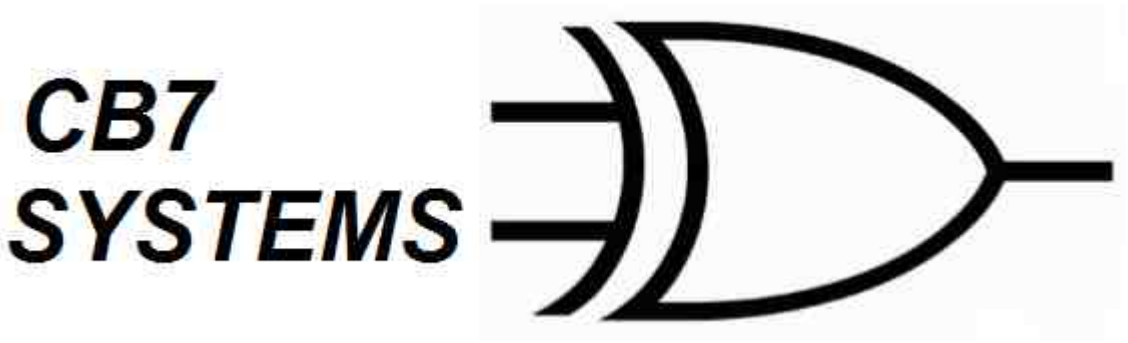
200016
CBF
Water Cooled
AC Load System
Specifications



CB7 Systems LLC

Disclaimer
The contents of this document, including all specifications, are subject to change without notice.


0.0 V
0.0 C
0.0 KW
0.0 C

200016 Technical Data

Size:

72 in x 40 in x 24 in

Weight:

850 lbs.

Voltage:

480 VAC 3Ph Delta 50/60Hz

Current:

303 A/Ph

Power:

252 KW

Maximum Flow Rate:

60 GPM

Maximum Fluid Pressure:

150 PSI

Maximum Outlet Temperature:

Adjustable to 95 degC

Load Connections:

Cam Lok

Fluid Connections:

2 inch type F

Coolant:

water or water/glycol

200016 Technical Data (cont)

Operation Modes:

Loadbank	(fixed power load)
Delta T	(fixed power)
Delta T	(fixed flow rate)
Fixed T	(fixed power)
Fixed T	(fixed flow rate)

Measurement Capability:

Input Load Voltage
Load Current
Load Power
Inlet Temperature
Exhaust Temperature
Fluid Flow Rate
BTUs expended

Safety Features:

Over Temperature (sensor / thermal switch / relief valve)
Adjustable Limit On Exhaust Temperature
Over Pressure
Over Power
Over Voltage
Trapped Air
Phase Imbalance

Display:

7 inch Color Touch Screen

200016 Technical Data (cont)

Communication:

Ethernet
CAN bus
RS232
USB

Protocols:

HTTP (web)
TCP Sockets
Modbus TCP
SNMP v2c
Telnet
J1939 (CanBus)

External Control Power:

120VAC Single Ph (150 watt)8 channels

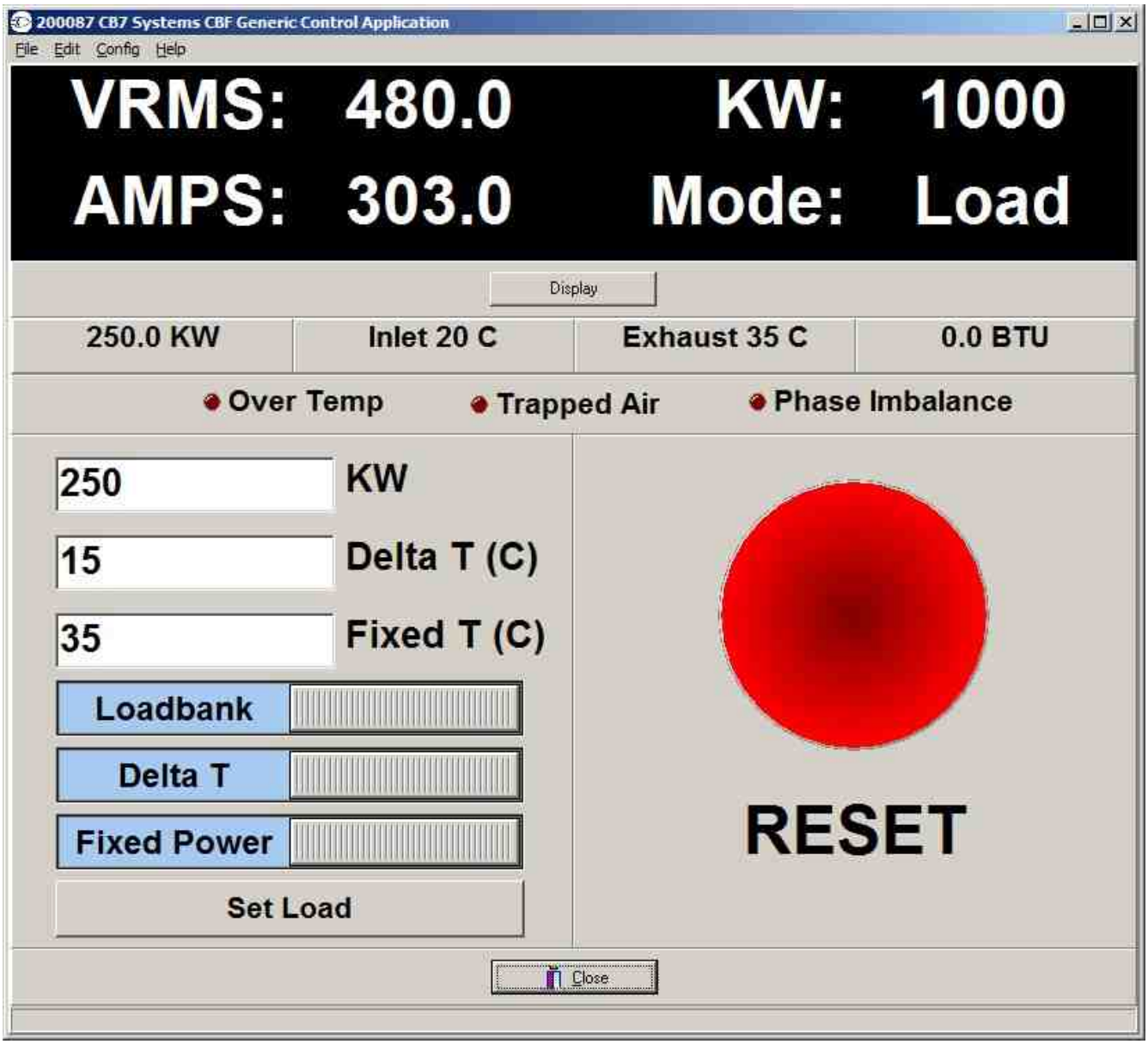
Extended Configuration:

Series connection	higher power with extended Delta T
Parallel connection	higher power with increased flow rate

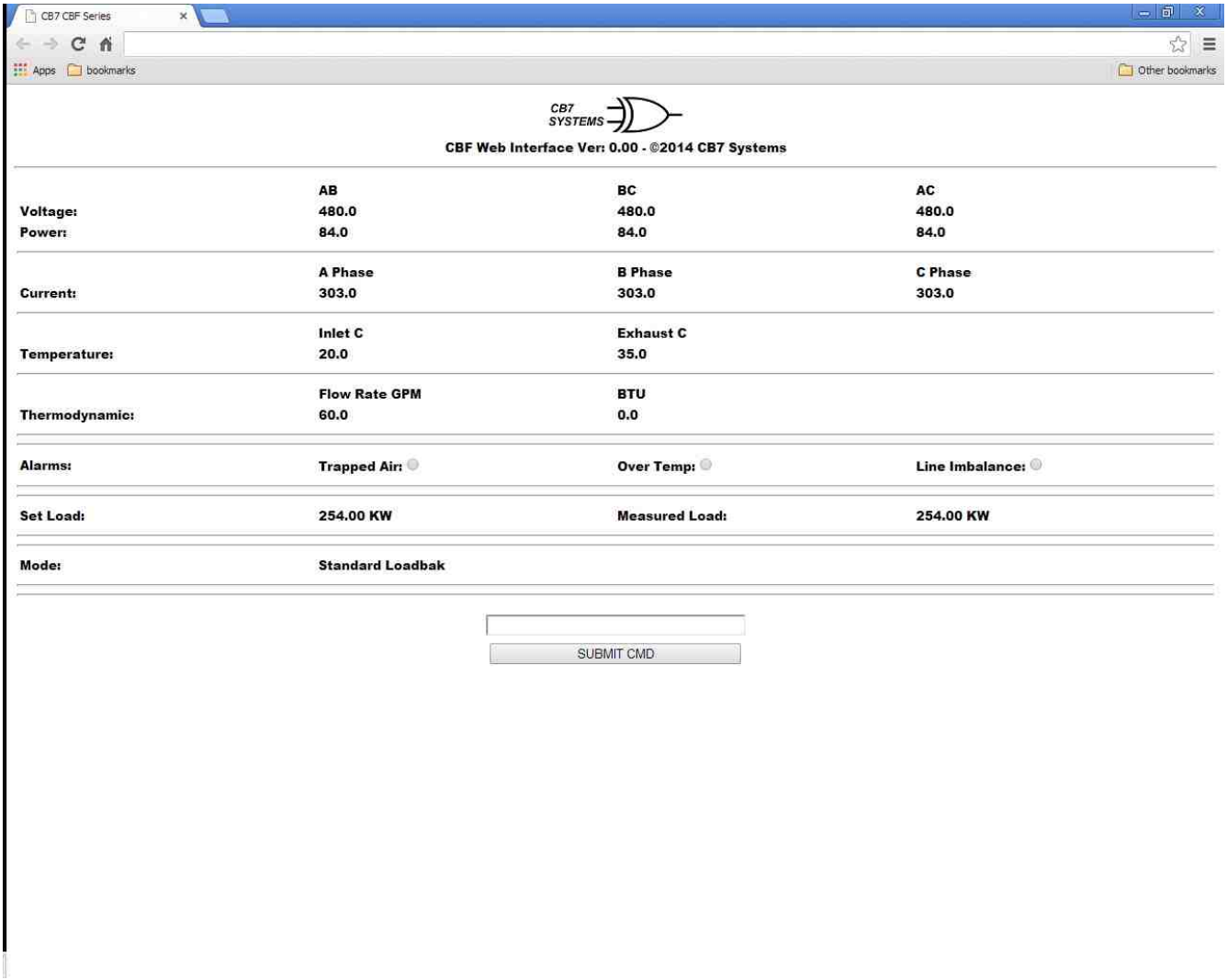
Other:

Real Time Clock Calendar
1MB non volatile memory

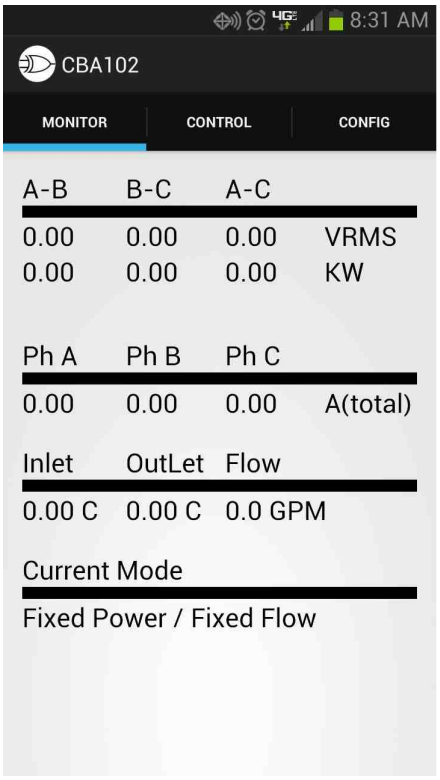
CBF Windows Control

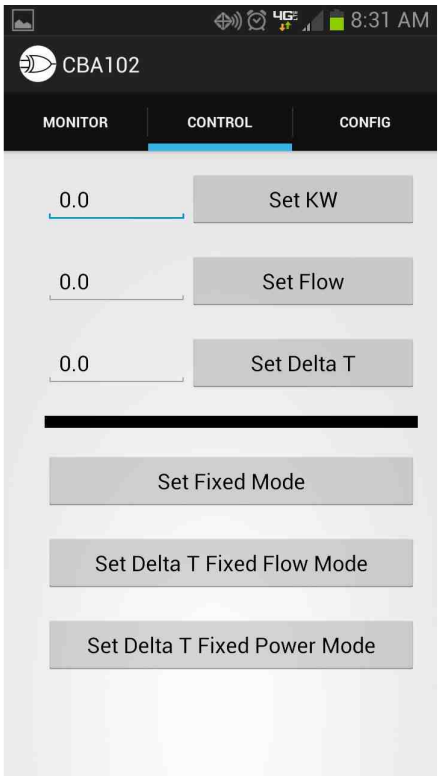


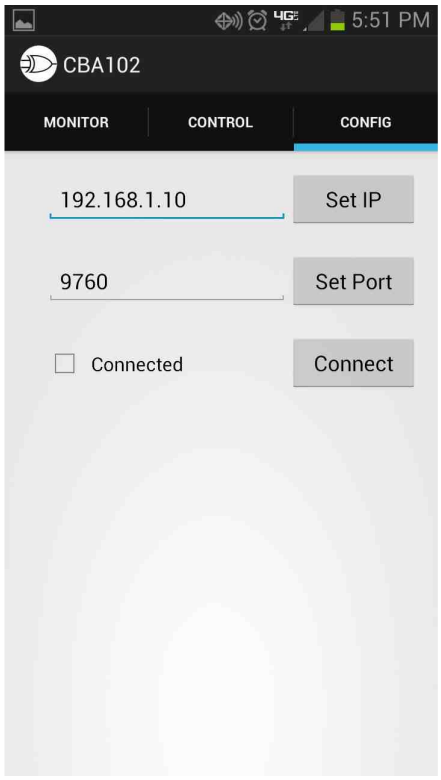
CBF Integrated Web Page



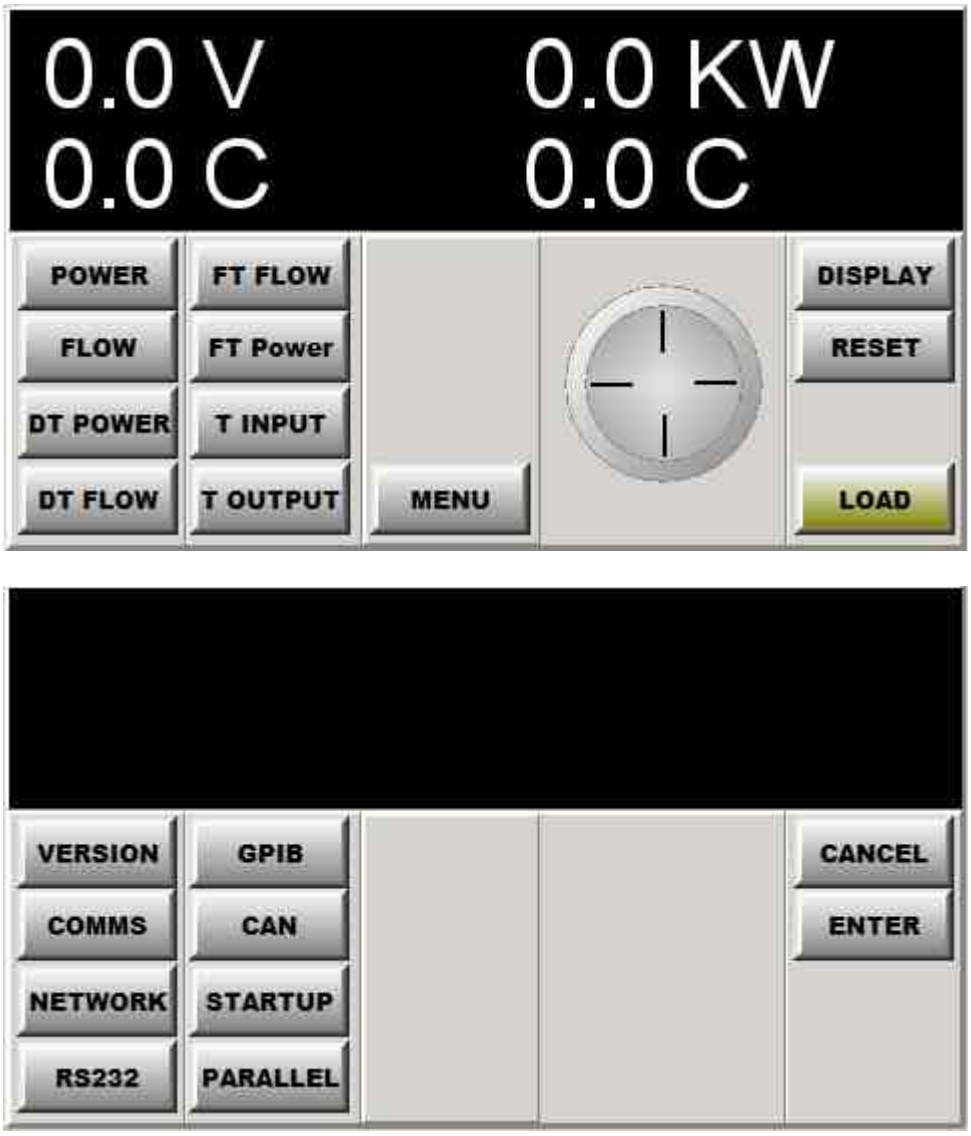
CBF Android Control







CBF Touch Screen Interface



CBF ASCII Commands

SETP	sets load bank fixed power level
DTF	sets load bank delta t / fixed flow mode
DTP	sets load bank delta t / fixed power mode
FTF	sets load bank fixed t / fixed flow mode
FTP	sets load bank fixed t / fixed power mode
VAB?	returns measured AB phase voltage
VBC?	returns measured BC phase voltage
VAC?	returns measured AC phase voltage
IA?	returns measured A phase current
IB?	returns measured B phase current
IC?	returns measured C phase current
V?	returns composite measured phase voltage
I?	returns composite measured phase current
P?	returns load bank measured power
TIN?	returns measured input temperature
TOUT?	returns measured exhaust temperatures
FLOW?	returns measured flow rate
ALARM?	returns load bank alarm value
STATUS?	returns load bank status value
BTU	initializes BTU counter
BTU?	returns BTUs expended
FAREN	changes to fahrenheit units mode
CELSI	changes to celsius units mode
CLRALRM	clears the load bank latched alarms
CLRSTAT	clears the load bank latched status
SETP?	returns load bank programmed power
MODE?	returns load bank programmed operation mode
DT?	returns load bank programmed delta t
F?	returns load bank programmed flow rate
MODEL?	returns load bank model information
MAXP?	returns load bank telemetry - maximum applied power
MAXV?	returns load bank telemetry - maximum applied voltage
MAXI?	returns load bank telemetry - maximum applied current
MINV?	returns load bank telemetry - minimum applied voltage (under load)
MAXF?	returns load bank telemetry – maximum flow rate
MINF?	returns load bank telemetry – minimum flow rate

CBF ASCII Commands (cont)

IP?	returns Ethernet IP address
IP	sets Ethernet IP address
NM?	returns Ethernet Net Mask
NM	sets Ethernet Net Mask
GWY?	returns Ethernet Gateway address
GWY	sets Ethernet Gateway address
PORT?	returns Ethernet TCP port value
PORT	sets Ethernet TCP port value
MAC?	returns Ethernet MAC address
SNMPNME?	returns SNMP name information
SNMPNME	sets SNMP name information
SNMPCON?	returns SNMP contact information
SNMPCON	sets SNMP contact information
SNMPLOC?	returns SNMP location information
SNMPLOC	sets SNMP location information
TRAPADR?	returns SNMP trap addresses
TRAPADR	sets SNMP trap addresses
TRAPEN?	returns SNMP enabled trap addresses
TRAPEN	sets SNMP enabled trap addresses
TRAPCOM?	returns SNMP trap community information
TRAPCOM	sets SNMP trap community information
TRAPTEST	sends a test trap to all enabled trap addresses
COMMCFG?	returns active communication channels
COMMCFG	sets active communication channels
TEMP?	returns load bank internal processor temperature

CBF Modbus Register Map

Discrete Register	0x08	Voltage Phase Imbalance Alarm
Discrete Register	0x09	Current Phase Imbalance Alarm
Discrete Register	0x0A	Trapped Air Alarm
Discrete Register	0x0B	Over Temp Alarm
Input Register	0x01	AB Voltage
Input Register	0x02	BC Voltage
Input Register	0x03	AC Voltage
Input Register	0x04	A Current
Input Register	0x05	B Current
Input Register	0x06	C Current
Input Register	0x07	Measured Power
Input Register	0x08	Measured Voltage
Input Register	0x09	Measured Current
Input Register	0x1E	Card Temperature
Input Register	0x22	AB BC Voltage Imbalance
Input Register	0x23	AB AC Voltage Imbalance
Input Register	0x24	BC AC Voltage Imbalance
Input Register	0x25	AB Current Imbalance
Input Register	0x26	AC Current Imbalance
Input Register	0x27	BC Current Imbalance
Input Register	0x28	Max Measured Power
Input Register	0x29	Max Measured Voltage
Input Register	0x2A	Max Measured Current
Input Register	0x2B	Min Measured Voltage Under Load
Input Register	0x2A	1000*VAB Gain Cal
Input Register	0x2B	1000*VBC Gain Cal
Input Register	0x2C	1000*VAC Gain Cal
Input Register	0x2D	1000*IA Gain Cal
Input Register	0x2E	1000*IB Gain Cal
Input Register	0x2F	1000*IC Gain Cal
Input Register	0x31	System Voltage
Input Register	0x32	System Current
Input Register	0x33	System Power
Input Register	0x34	SystemType
Input Register	0x35	INTEGER FIRMWARE VERSION
Input Register	0x36	INTEGER PART NUMBER
Input Register	0x37	IP 0
Input Register	0x38	IP 1
Input Register	0x39	IP 2
Input Register	0x3A	IP 3
Input Register	0x3B	NM 0
Input Register	0x3C	NM 1
Input Register	0x3D	NM 2
Input Register	0x3E	NM 3
Input Register	0x40	GWY 0
Input Register	0x41	GWY 1
Input Register	0x42	GWY 2
Input Register	0x43	GWY 3
Input Register	0x44	MAC 0

CBF Modbus Register Map (cont)

Input Register	0x45	MAC 1
Input Register	0x46	MAC 2
Input Register	0x47	MAC 3
Input Register	0x48	MAC 4
Input Register	0x49	MAC 5
Input Register	0x4A	DNS1 0
Input Register	0x4B	DNS1 1
Input Register	0x4C	DNS1 2
Input Register	0x4D	DNS1 3
Input Register	0x4E	DNS2 0
Input Register	0x4F	DNS2 1
Input Register	0x50	DNS2 2
Input Register	0x51	DNS2 3
Input Register	0x52	DHCP 0
Input Register	0x53	DHCP 1
Input Register	0x54	DHCP 2
Input Register	0x55	DHCP 3
Input Register	0x56	SMTP 0
Input Register	0x57	SMTP 1
Input Register	0x58	SMTP 2
Input Register	0x59	SMTP 3
Input Register	0x5A	SNMP Trap Address 00
Input Register	0x5B	SNMP Trap Address 01
Input Register	0x5C	SNMP Trap Address 02
Input Register	0x5D	SNMP Trap Address 03
Input Register	0x5E	SNMP Trap Address 10
Input Register	0x5F	SNMP Trap Address 11
Input Register	0x60	SNMP Trap Address 12
Input Register	0x61	SNMP Trap Address 13
Input Register	0x62	SNMP Trap Address 20
Input Register	0x63	SNMP Trap Address 21
Input Register	0x64	SNMP Trap Address 22
Input Register	0x65	SNMP Trap Address 23
Input Register	0x66	SNMP Trap Address 30
Input Register	0x67	SNMP Trap Address 31
Input Register	0x68	SNMP Trap Address 32
Input Register	0x69	SNMP Trap Address 33
Input Register	0x6A	TCP Port
Input Register	0x6B	Communication Cfg
Input Register	0x6C	CBF current mode
Input Register	0x6D	CBF current status
Input Register	0x6E	CBF current alarm
Input Register	0x6F	CBF msrd power in KW
Input Register	0x70	CBF msrd inlet temp
Input Register	0x71	CBF msrd exhaust temp
Input Register	0x72	CBF msrd flow rate
Input Register	0x73	CBF msrd delta t
Input Register	0x74	CBF fahrenheit / celsius
Input Register	0x75	CBF set power
Input Register	0x76	CBF set delta t
Input Register	0x77	CBF set t exhaust

CBF Modbus Register Map (cont)

Input Register	0x78	CBF set flow rate
Input Register	0x79	CBF pcr drive voltage
Input Register	0x7A	CBF servo drive voltage
Input Register	0x7B	CBF flow switch
Input Register	0x7C	CBF max measured flow rate
Input Register	0x7D	CBF min measured flow rate
Input Register	0x7E	CBF max measured temp
Holding Register	0x01	Reset System
Holding Register	0x02	Restart System
Holding Register	0x1E	Card Temperature
Holding Register	0x22	AB BC Voltage Imbalance
Holding Register	0x23	AB AC_Voltage Imbalance
Holding Register	0x24	BC AC_Voltage Imbalance
Holding Register	0x25	AB Current Imbalance
Holding Register	0x26	AC Current Imbalance
Holding Register	0x27	BC Current Imbalance
Holding Register	0x28	Max Measured Power
Holding Register	0x29	Max Measured Voltage
Holding Register	0x2A	Max Measured Current
Holding Register	0x2B	Min Measured Voltage Under Load
Holding Register	0x2A	1000*VAB Gain Cal
Holding Register	0x2B	1000*VBC Gain Cal
Holding Register	0x2C	1000*VAC Gain Cal
Holding Register	0x2D	1000*IA Gain Cal
Holding Register	0x2E	1000*IB Gain Cal
Holding Register	0x2F	1000*IC Gain Cal
Holding Register	0x31	System Voltage
Holding Register	0x32	System Current
Holding Register	0x33	System Power
Holding Register	0x34	System Type
Holding Register	0x35	INTEGER FIRMWARE VERSION
Holding Register	0x36	INTEGER PART NUMBER
Holding Register	0x37	IP0
Holding Register	0x38	IP1
Holding Register	0x39	IP2
Holding Register	0x3A	IP3
Holding Register	0x3B	NM0
Holding Register	0x3C	NM1
Holding Register	0x3D	NM2
Holding Register	0x3F	NM3
Holding Register	0x40	GWY0
Holding Register	0x41	GWY1
Holding Register	0x42	GWY2
Holding Register	0x43	GWY3
Holding Register	0x44	MAC0
Holding Register	0x45	MAC1
Holding Register	0x46	MAC2
Holding Register	0x47	MAC3
Holding Register	0x48	MAC4
Holding Register	0x49	MAC5

CBF Modbus Register Map (cont)

Holding Register	0x4A	DNS1 0
Holding Register	0x4B	DNS1 1
Holding Register	0x4C	DNS1 2
Holding Register	0x4D	DNS1 3
Holding Register	0x4E	DNS2 0
Holding Register	0x4F	DNS2 1
Holding Register	0x50	DNS2 2
Holding Register	0x51	DNS2 3
Holding Register	0x52	DHCP0
Holding Register	0x53	DHCP1
Holding Register	0x54	DHCP2
Holding Register	0x55	DHCP3
Holding Register	0x56	SMTP0
Holding Register	0x57	SMTP1
Holding Register	0x58	SMTP2
Holding Register	0x59	SMTP3
Holding Register	0x5A	SNMP Trap Address0 0
Holding Register	0x5B	SNMP Trap Address0 1
Holding Register	0x5C	SNMP Trap Address0 2
Holding Register	0x5D	SNMP Trap Address0 3
Holding Register	0x5E	SNMP Trap Address1 0
Holding Register	0x5F	SNMP Trap Address1 1
Holding Register	0x60	SNMP Trap Address1 2
Holding Register	0x61	SNMP Trap Address1 3
Holding Register	0x62	SNMP Trap Address2 0
Holding Register	0x63	SNMP Trap Address2 1
Holding Register	0x64	SNMP Trap Address2 2
Holding Register	0x65	SNMP Trap Address2 3
Holding Register	0x66	SNMP Trap Address3 0
Holding Register	0x67	SNMP Trap Address3 1
Holding Register	0x68	SNMP Trap Address3 2
Holding Register	0x69	SNMP Trap Address3 3
Holding Register	0x6A	TCP Port
Holding Register	0x6B	Communication Cfg
Holding Register	0x6C	CBF current mode
Holding Register	0x6D	CBF current status
Holding Register	0x6E	CBF current alarm
Holding Register	0x6F	CBF msrd power in KW
Holding Register	0x70	CBF msrd inlet temp
Holding Register	0x71	CBF msrd exhaust temp
Holding Register	0x72	CBF msrd flow rate
Holding Register	0x73	CBF msrd delta t
Holding Register	0x74	CBF fahrenheit / celsius
Holding Register	0x75	CBF set power
Holding Register	0x76	CBF set delta t
Holding Register	0x77	CBF set t exhaust
Holding Register	0x78	CBF set flow rate
Holding Register	0x79	CBF pcr drive voltage
Holding Register	0x7A	CBF servo drive voltage
Holding Register	0x7B	CBF flow switch
Holding Register	0x7C	CBF max measured flow rate

CBF Modbus Register Map (cont)

Holding Register	0x7D	CBF min measured flow rate
Holding Register	0x7E	CBF max measured temp

CBF SNMP MIB

```
-- CBF control MIB.
--
-- Author               Date       Comment
-- ================================================================
-- Lance Palatini       2/1/14     Initial
--

CB7SYSTEMS DEFINITIONS ::= BEGIN

IMPORTS
        enterprises, IpAddress
                FROM RFC1155-SMI
        OBJECT-TYPE
                FROM RFC-1212
        TRAP-TYPE
                FROM RFC-1215
        DisplayString
                FROM RFC1213-MIB;


on-off ::= INTEGER {
                off (0),
                on (1)
        }

cb7systems          OBJECT IDENTIFIER ::= { enterprises 43048 }
product             OBJECT IDENTIFIER ::= { cb7systems 1 }
setup               OBJECT IDENTIFIER ::= { cb7systems 2 }
control             OBJECT IDENTIFIER ::= { cb7systems 3 }

productname  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { product 1 }

productversion  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { product 2 }
```

CBF SNMP MIB (cont)

```
versiondate  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { product 3 }

trapsTable  OBJECT-TYPE
        SYNTAX SEQUENCE OF TrapsEntry
        ACCESS     not-accessible
        STATUS     mandatory
        DESCRIPTION
                "Trap table"
        ::= { setup 1 }

trapsEntry  OBJECT-TYPE
        SYNTAX          TrapsEntry
        ACCESS     not-accessible
        STATUS     mandatory
        DESCRIPTION
                "Single trap entry containing trap receiver info."
        INDEX { trapReceiverNumber }
        ::= { trapsTable 1 }

TrapsEntry ::= SEQUENCE {
        trapReceiverNumber
                INTEGER,
        trapEnabled
                INTEGER,
        trapReceiverIPAddress
                IpAddress,
        trapCommunity
                DisplayString
}

--

trapReceiverNumber  OBJECT-TYPE
        SYNTAX     INTEGER (0..4)
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                "Index of trap receiver"
        ::= { trapsEntry 1 }
```

CBF SNMP MIB (cont)

```
trapEnabled  OBJECT-TYPE
        SYNTAX     INTEGER {
                no (0),
                yes (1)
        }
        ACCESS     read-write
        STATUS     mandatory
        DESCRIPTION
                "Indicates if this trap entry is enabled or not."
        ::= { trapsEntry 2 }

trapReceiverIPAddress  OBJECT-TYPE
        SYNTAX     IpAddress
        ACCESS     read-write
        STATUS     mandatory
        DESCRIPTION
                "Trap receiver IP address"
        ::= { trapsEntry 3 }

trapCommunity  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..7))
        ACCESS     read-write
        STATUS     mandatory
        DESCRIPTION
                "Trap community to be used by agent to send trap"
        ::= { trapsEntry 4 }

systemname  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-write
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 1 }

systemcontact  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-write
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 2 }

systemlocation  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-write
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 3 }
```

CBF SNMP MIB (cont)

```
systemtesttrap  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 4 }

systemruntime  OBJECT-TYPE
        SYNTAX     DisplayString
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 5 }

systemtemperature  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 6 }

cbftrappedairfail  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 7 }

cbfovertempfail    OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 8 }

cbfvoltageimbalance  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 9 }
```

CBF SNMP MIB (cont)

```
cbfcurrentimbalance  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 10 }

cbfoperationmode  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 11 }

cbfstatus  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 12 }

cbfalarm  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 13 }

cbfmeasuredtin  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 14 }

cbfmeasuredtout  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 15 }
```

CBF SNMP MIB (cont)

```
cbfmeasuredflow  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 16 }

cbfmeasureddeltat  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 17 }

cbfahrenheit  OBJECT-TYPE
        SYNTAX     INTEGER
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 18 }

cbfmeasuredvoltage  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 19 }

cbfmeasuredcurrent  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 20 }

cbfmeasuredpower  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 21 }
```

CBF SNMP MIB (cont)

```
cbfsetpower  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 22 }

cbfsetflow  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 23 }

cbfsetdeltat  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 24 }

cbfsettout  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 25 }

cbfsetmode  OBJECT-TYPE
        SYNTAX     DisplayString (SIZE(0..15))
        ACCESS     read-only
        STATUS     mandatory
        DESCRIPTION
                ""
        ::= { control 26 }

trapcbfairfail  TRAP-TYPE
        ENTERPRISE enterprises
        VARIABLES { cbftrappedairfail }
        DESCRIPTION
                ""
        ::= 1
```

CBF SNMP MIB (cont)

```
trapcbfovertemp  TRAP-TYPE
        ENTERPRISE enterprises
        VARIABLES { cbfovertempfail }
        DESCRIPTION
                ""
        ::= 2

cbftrapphaseimbalance  TRAP-TYPE
        ENTERPRISE enterprises
        VARIABLES { cbfphaseimbalance }
        DESCRIPTION
                ""
        ::= 3

traptest  TRAP-TYPE
        ENTERPRISE enterprises
        VARIABLES { systemtesttrap }
        DESCRIPTION
                ""
        ::= 4
END

-- This MIB was created using NuDesign Technologies' Visual MIBuilder (Ver 5.2).
```