6.0 MODBUS MEMORY MAP

The BCM/SFCM uses Modbus RTU with the following transmission parameters:

- 8 Data bits
- No Parity
- 1 Stop Bit
- Baud rates: 9600, 19200, 57600, and 115200

CRC-16 algorithm is used for error checking.

Timing details for Packet framing and data transmission:

- Maximum inter byte delay is 3.5 bit times with any baud rate
- Minimum inter packet delay is 3.5 bit times with any baud rate
- Maximum slave response time is 100ms

Modbus registers are organized into reference types identified by the leading number of the reference address:

Table 6.0.1: Modbus Register Addresses

Reference	Description
0xxxx	Read/Write Discrete Outputs or Coils. A 0x reference address is used to drive output data to a digital output channel.
1xxxx	Read Discrete Inputs. The ON/OFF status of a 1x reference address is controlled by the corresponding digital input channel.
3xxxx	Read Input Registers. A 3x reference register contains a 16-bit number received from an external source—e.g. an analog signal.
4xxxx	Read/Write Output or Holding Registers. A 4x register is used to store 16-bits of numerical data (binary or decimal), or to send the data from the CPU to an output channel.

Table 6.0.2: Function Codes Supported

Function	Function Type	Application
03h	Read Holding Register	Read metering data and Configuration data
06h	Preset Single Register	Change Configuration data/Reset Warnings & Alarms
10h	Preset Multiple Registers	Change Configuration data/Reset Warnings & Alarms
11h	Report Slave ID	To Report active BCMs/SFCMs in Modbus Network

Table 6.0.3: Exception Responses from BCM/SFCM

Error Code	Error	Meaning
1	Illegal Function	Function code requested by Master is not supported
2	Illegal Data Address	The Data Address requested by Master is not valid
3	Illegal Data Value	The Data value is not acceptable

All Modbus variables are stored in 16-bit registers. The BCM/SFCM Modbus mapping definition follows industry standard with starting address of Output Holding Register 40001.

Each BCM/SFCM digital board supports up to a maximum of 4 panelboards. The Modbus registers for each panelboard are separated by an offset of 2000.

There are two software categories that have been used in the Cyberex BCM/SFCM units as follows.