



DSE Genset®

**COMPLEX
SOLUTIONS
MADE
SIMPLE.**



Modbus

- **DESCRIPTION**

Many DSE controllers support the Modbus protocol. This document is intended to describe the types of modbus supported by the DSE controller and how different *Modbus Master* systems can be used to communicate with the DSE controller.

There are many kind of Modbus, not all are compatible with the DSE controller.

- **TYPE OF MODBUS**

DSE Controllers with Serial interfaces (USB, RS232 or RS485) support MODBUS RTU.

DSE Controllers with Ethernet sockets fitted to the controller support MODBUS TCP.

Modbus ASCII, DANIEL, ENRON or other Modbus implementations are not supported by the DSE controller.

- **ADDRESSING THE MODULE**

DSE controllers support the full modbus address range (0-65535 decimal, 0000-FFFF hexadecimal) therefore to address every register in the DSE module, the Modbus Master system must also support this address range.

All DSE modbus registers are classified as *Holding Registers*. They can only be read using modbus function code 3 (Read Multiple Registers).

- **ZERO BASED ADDRESSING**

Some modbus masters require '1' adding to the address in the query. This '1' is subtracted from the address before sending the query to the DSE controller.

Therefore you address register 1025 in the modbus master program. The modbus master actually sends a request to the DSE controller for address 1024.

- **40000 suffix**

Some modbus masters use a suffix to the address as a way of specifying the function code to use for the query.

For example 41,029 is used to instruct the master to query address 1029 using function code 3. Some modbus masters also require you to add '1' as previously described.

This means that in many cases the master can read only up to DSE register 9999 (49999 is last register that will be read using function code 3).

These modbus masters are therefore limited and cannot read the full list of registers from the DSE module.

- **REGISTER VALUES**

Due to the varied nature of the data measured by the DSE controller, the registers are a mix of different data types.

Some of the registers may contain large values (such as generator watts) therefore 32 bit registers (2 x 16 bit registers) are used to store these values.

Some registers may contain negative values (such as power factor) so the registers are signed conforming to the two's complement method of storing negative values.

Some registers are used to contain floating point numbers (such as battery volts). As registers are integer values only, they are stored with a scaling factor. For example a battery voltage of 12.4 V is stored in the register as 124.

In summary, the modbus master needs to support registers of the following types :

- 16 bits and 32 bits
- Signed and Unsigned
- Scaling Factors

- **SENTINEL VALUES**

The DSE module will sometimes reply with a Sentinel value. This is where a predefined value is used to signify something special about the register being read.

Examples are :

- Value not implemented. This means that the controller being queried does not support the instrument being read. This may be due to functional design or may indicate that the feature is disabled by module configuration.
- Above or Below measurable range.
- Data error which may be caused by an open circuit analogue sensor.

• **FURTHER INFORMATION**

Further information on DSE Gencomm can be obtained from the following presentations and documents

Documents

056-045 PLC as Load Demand Controller
056-051 Gencomm Control Keys

Training Presentations

056-078 DSEGencomm
056-076 Gencomm Alarms
056-079 Gencomm Status