

1. Introduction

This document will let you start using SGW1-MB-DF1 in a matter of minutes.

SGW1-MB-DF1 is an easy-to-use Modbus ASCII/RTU to DF1 Converter. Just connect the Converter to your DF1-enabled device and gain access to your PLC as if it had an actual Modbus port.

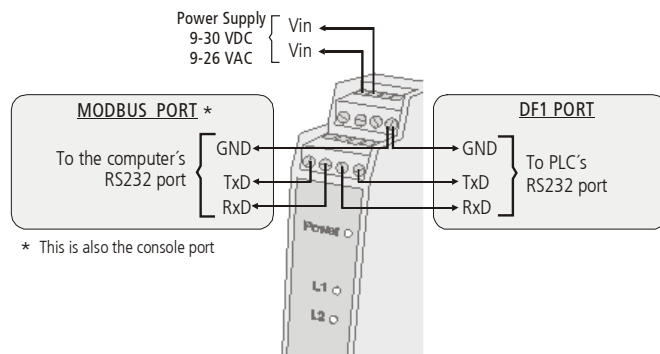
This document does not replace the SGW1-MB-DF1 User's Manual. Please refer to it for details not covered here.

2. Setting up the Converter

POWER The power input connection is done in the Vin terminals. SGW1-MB-DF1 powering has no polarity and accepts an input voltage range of 9 to 30 VDC and 9 to 26 VAC.

Modbus port Connect RXA, TXA and GND signals that come from the Exemys device to TX, RX and GND signals of your PC comport.

DF1 port TXB, RXB and GND signals that come from the Exemys device must be connected to the RX, TX and GND signals of the PLC's DF1 port.



3. Serial ports configuration

Configuration is based on a text-based console. It is tied to the Modbus port and it can be opened only within the first seven seconds after power on.

Procedure:

- 1) In your computer, open a terminal program (HyperTerminal or alike), at 9600 bps, eight data bits, no parity, no flow control.
- 2) Power on the device and type CFG <ENTER>. The following screen should appear:

```
SGW1-MB-DF1 - Exemys (v1.2):
-----
>
```

- 3) To configure the Modbus port parameters (assuming 115200 bps, no parity and Modbus RTU) type:

```
>mbbaud:115200
OK, Baud rate:115200

>mbparity:n
OK, Parity:NONE

>mbmode:r
```

```
OK, Mode:RTU
```

- 4) To configure the DF1 port parameters (assuming CRC as the method for error detection) type:

```
>autodetect
Please wait while detecting
configuration...
    Baud rate: 19200
    Parity: NONE

>error:crc
OK, Error detection mechanism:CRC
```

4. Translation Tables configuration

SGW1-MB-DF1 translates from Modbus to DF1 by associating command sets in one protocol into command sets in the other protocol. Such a command association is stated in the internal Translation Tables, which can be reconfigured as desired to adapt the device to your needs. Inputs and Outputs Modules connected to the PLC do not require any table configuration.

Understanding the tables

SGW1-MB-DF1 maintains three tables for protocol translation. They are classified according to different features of your PLC:

- N Files	16-bit variables	(read/write)
- B Files	1-bit variables	(read/write)
- S File	16-bit variables	(read only)

Every item in a table is composed of two sets. The first set is associated to the DF1 protocol, while the second set refers to the Modbus protocol. The factory default tables are shown by typing the command `tblview`:

```
>tblview
```

```
N Table
Length: 0
```

File	Holding
Number	Register

```
*** Table empty ***
```

```
B Table
Length: 0
```

File	Coil
Number	Status

```
*** Table empty ***
```

```
S Table
Length: 1
```

File	Input
Number	Status
2	30192 30448

- The **N Files** table maps those N Elements into Holding Registers, thus providing reads and writes of 16-bit words. Up to thirty two N Files can be inserted to this table. It must be filled with the File Numbers associated to the N File(s) you want to map into Modbus locations
- The **B Files** table can map up to two B Files. SGW1-MB-DF1 associates 1-bit variables stored in B Files into Coils Status locations, making it possible to access to individual bits of these Files. This table must be filled with the File Number(s) associated to the B File(s) you want to map into Modbus locations.
- Finally, the **S File** table, lets you monitor statistic information reported by many PLCs. This table is not user configurable and it only allows reads (Input Register locations).

The method to insert records into the table is straightforward. You will only have to insert a few data before start using this device, the SGW1-MB-DF1 will automatically assign most of the fields for you.

An Example

Henceforth, a real situation is proposed. It might differ slightly from your actual configuration, though we think of an example as the best way to get in touch with your new Converter. There is PLC that runs a program. We want to make some data available to one Modbus master by means of the SGW1-MB-DF1. The PLC has four Input/Output boards. These boards have the following I/O capabilities:

Module	Characteristics
1	16 Digital Inputs
2	32 Digital Outputs
3	4 Analog Inputs
4	32 Digital Outputs

It is required to access not only I/O data, but it is also important to monitor some words, contained in two N Files (File Numbers 7 and 10) and on some read/write bit variables, contained in one B File, whose File Number is 3.

The modules will be addressed as shown in the following table, according to the rules above.

Module	Coil Status	Input Status	Holding Register	Input Register
1		10001-10016		30001-30001
2	00001-00032		40001-40002	
3		10017-10080		30002-30005
4	00033-00064		40003-40004	

Next, we configure the tables in order to address the required items (two N Files and one B File):

```
>tblins:n,0,7
Record inserted

>tblins:n,1,10
Record inserted
>tblins:b,0,3
Record inserted
```

We verify that the tables were filled correctly:

```
>tblview

N Table
Length: 2

    File | Holding
Number | Register
-----|-----
    7   | 40192 40447
   10   | 40448 40703

B Table
Length: 1

    File | Coil
Number | Status
-----|-----
    3   | 01152 05247

S Table
Length: 1

    File | Input
Number | Status
-----|-----
    2   | 30192 30448

>
```

Note that the addresses are assigned dynamically. Then, your Modbus master will have to poll those addresses assigned by the SGW1-MB-DF1.

After filling the tables with the appropriate information, the device is ready to accept polls from your Modbus master. Type end <ENTER>, close the terminal, restart the SGW1-MB-DF1 and wait for at least 7 seconds before issuing polls to the device with your favorite Modbus application.