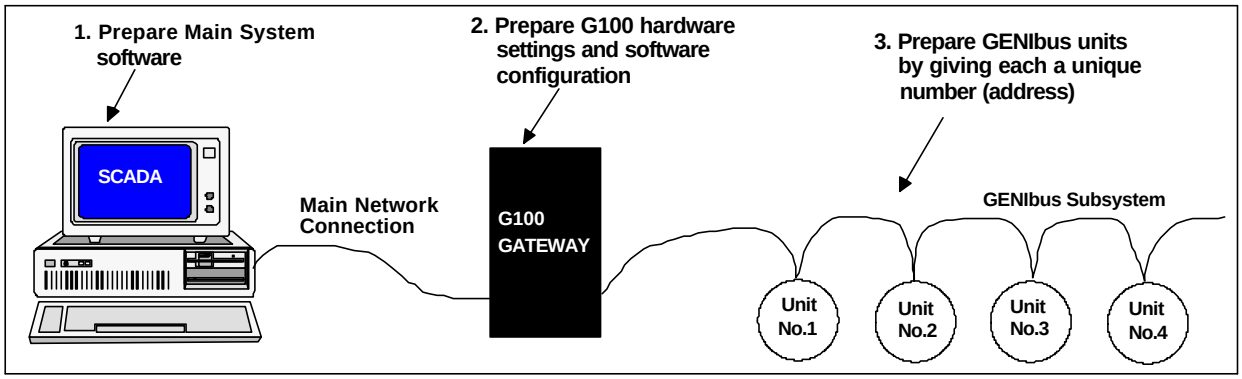
Getting started
communicating with G100

This short guide provides you with an overview of what the Support Files discs contain and what is required to get started communicating between your Main System (master) and one or more GENIbus devices via G100.

Integrating a GENIbus subsystem with a SCADA system via G100 implies the following steps (not necessarily in this order)**.**



1. Prepare Main System software

1.1 Implementation of G100 communication

G100 builds a "mirror" of the data in all units connected to the GENIbus Subsystem. G100 keeps this "mirror" updated by regularly polling all the units. When the Main System accesses the data (read or write) in a GENIbus unit via G100, it works, seen from the Main System, as if communication takes place with the unit directly.

Data in G100 is organised in objects. The general object model is described in *objref.pdf*. The objects are the same and are read or written indifferently no matter the type of Main Network Connection. Profibus, Interbus, MODbus, etc. are all just different ways of "wrapping in" the transfer of the data objects.

G100 Protocol (G100-Basic and G100-R/M/P)
This protocol is specially designed for G100. It handles communication with G100 Service Port and R/M/P Port 1. Communication can take place as a direct RS232 connection, connection via modem or connection via radio (R/M/P Port 1 only). You find the specification of the protocol together with application examples in *G100PROT\g100prot.pdf*. Included on the Support File discs is also a DLL driver implementation for W95/NT of the G100 protocol (*g100.dll*). This is an easy and fast way to get access to G100 from any Windows application program like Delphi, Visual C++ or LabView. You will find all files relating to this DLL in directory *G100PROT\G100DLL*. The user manual with examples is in file *g100dll.pdf*, and the subdirectories *C* and *DELPHI* contain windows application examples.

Satt Control Comli Protocol (G100-R/M/P).
This protocol handles communication with R/M/P Port 1. Communication can take place as a direct RS232 connection, connection via modem or connection via radio. The actual protocol specification can be found in public literature (e.g. Alfa Laval Automation AB: Doc No. 493-0192-11, "Comli System Description"). The file *RMP\COMLI\comli.pdf* is a user manual describing access of G100 via the Comli protocol, and the *C* subdirectory contains an application example.

MODbus (G100-R/M/P)
This protocol handles communication with R/M/P Port 1. Communication can take place as a direct RS232 connection, connection via modem or connection via radio. The actual protocol specification can be found in public literature (e.g. www.modicon.com/techpubs/toc7.html). The file *RMP\modbus\modbus.pdf* is a user manual describing access of G100 via the MODbus protocol and the *C* subdirectory contains an application example.
IMPORTANT! G100 R/M/P can only contain one PLC protocol at a time. From the factory the Satt Control Comli protocol is installed. To change this, use PC Tool G100 to download the file *RMP\MODBUS\modbus.bin* from the Support Files to G100.

Interbus S (G100-Interbus)

Profibus DP (G100-Profibus)

The actual Profibus protocol specification can be found in public literature. But it is not necessary to have any knowledge of this to use Profibus with G100. G100 implements data transfer via Profibus by using an embedded telegram format inside the Profibus application data. The file *PROFIBUS\profibus.pdf* is a user manual which specifies the embedded telegram format and how to use it. The *PLC* and the *C* subdirectory each contain application examples. *PROFIBUS\g100gsd* is the G100 "Geräte Stamm Daten" (device description) file.

1.2 Handling of control and processing of data from GENIbus units

For the Main System to be able to handle and process the data it receives from the GENIbus units, it must know what data is available, how to use it and how to scale values. This knowledge is provided by the Functional Profiles. Each Grundfos Device Type (e.g. MGE motor, CU3 control unit) has its own Functional Profile. In the directory *PROFILES*, the Functional Profile for all supported products are documented. Each file is a list of Data Items with application chapters.

What is to be controlled in the GENIbus subsystem, how data is presented to the operator and how the operator is supposed to interact with the system, is all a matter of a system (customer) specification and beyond the scope of the G100 Support Files documentation.

2. Prepare G100

Description of the connectors, the hardware and the hardware settings can be found in the *Installation and operating instructions* which came with the G100. Below is a concise overview.

Connection	**Cable and Connector**	**Hardware settings** (default setting is BOLD)	**Software configurations** (e.g. using PC Tool G100)
GENIbus	Twisted pair with shield. 9 Sub-D female pin 2: RS485-A pin 3: RS485-B pin 5: Shield	None	None
Service Port	Standard RS232 cable 9 Sub-D female	Mother Board jumper: Baud rate: 2400/4800/**9600**/19200	None
Port 1 direct	Standard RS232 cable 9 Sub-D female	R/M/P Board address DIP switch: G100 Address: [1; 255], default **1** R/MP Board Port 1 DIP switch: I/O type: **Direct**/Modem/Radio/PLC Protocol: **Auto**/G100/SattContrComli Baud rate: 2400/4800/**9600**/19200	If MODbus is used, *modbus.bin* has to be downloaded
Port 1 radio			
Port 1 modem			w Modem initialization string w Selection of alarm call back phone No.
Profibus	Standard Profibus cable 9 Sub-D male	Profibus Address DIP switch: G100 Address: [1; 255], default **1**	None
Interbus	Standard Interbus cables Input: 9 Sub-D female Output: 9 Sub-D male	None	None

3. Prepare GENIbus subsystem

All units connected to GENIbus must have a unique address. This can be programmed by using the Grundfos R100 infrared remote controller or by using some PC tool connected to the units via GENIbus one at a time.

NOTICE! Giving a unit number *'x'* with R100 will result in the physical GENIbus unit address *'31+x'* which maps into the unit object index *'8479+x'* in G100. This is visualized by the table below.

R100 number	GENIbus address	G100 index
1	32 (0x20)	8480 (0x2120)
2	33 (0x21)	8481 (0x2121)
:	:	:
64	95 (0x5F)	8543 (0x215F)

G100 Support Files Contents

Disc 1				
readme.txt				Release notes, hints, problems
getstart.pdf				How to get started communicating with G100 (this document)
objref.pdf				The G100 Object Reference Specification
G100PROT	g100prot.pdf			G100 Protocol Specification
	basic.bin			G100 download file for basic vers. (factory installed in G100 Basic)
	G100DLL	g100dll.pdf		User manual for G100 Protocol DLL
		g100.dll		G100 Protocol DLL for W95/NT
		s7onlinx.dll		DLL used by g100.dll
		ibddiwnt.dll		DLL used by g100.dll
		dplib.dll		DLL used by g100.dll
		C	g100bc5.txt	Borland C++ 5.0 example using g100.dll
			g100.def	
			g100.lib	
			g100dll.h	
			ggdemo.*	
		DELPHI	main.*	Delphi 4.0 example using g100.dll
			dll_demo.*	
			hlpview.*	
			dial.*	
			hangup.*	
			g100_cnf.*	
			g100_def.*	
RMP				
	COMLI	comli.pdf		How to access G100 via the Comli Protocol
		comli.bin		G100 download file for Comli (factory installed in G100 R/M/P)
		C	comli_m.c	C code example of Comli master
			comli_m.exe	
	MODBUS	modbus.pdf		How to access G100 via the MODbus Protocol
		modbus.bin		G100 download file for MODbus communication
		C	modbus_m.c	C code example of MODbus master
			modbus_m.exe	
Disc 2				
PROFIBUS	profibus.pdf			How to access G100 via Profibus DP
	g100.gsd			Profibus Device Description file ("Geräte Stamm Daten")
	profibus.bin			G100 download file for Profibus (factory installed in G100 Profibus)
	PLC			
		ALLEN_B	ab_doc.txt	Example for Allen Bradley PLC with Profibus card
			ab_mast.*	
		SIEMENS	s7_ex.pdf	Example for Siemens S7 PLC with Profibus card
			s7_ex.arj	
	C	im180.c		Example for PC Profibus expansion board Siemens IM180
INTERBUS	interbus.pdf			How to access G100 via Interbus (Notice! This document is planned)
	interbus.bin			G100 download file for Interbus (factory installed in G100 Interbus)
PROFILES	mge.pdf			Operating the 3 phase MGE motor via GENIbus or G100
	upe.pdf			Operating the UPE pump via GENIbus or G100
	ups.pdf			Operating the UPS pump via GENIbus or G100
	cu3.pdf			Operating the CU3 Control Unit via GENIbus or G100
	cu300.pdf			Operating the CU300 Control Unit via GENIbus or G100
	ctr2000.pdf			Operating Control2000 via G100