SIPROTEC

Multifunction Paralleling Devices 7VE61, 7VE63

Communication module

Modbus
Bus mapping

Revision 1.0

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C53000-L1840-C017-03

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Preface

Purpose of this manual

The manual describes the register map organization of the Modbus slave of the SIPROTEC devices 7VE61, 7VE63 and is devided into the following topics:

- Modbus register map → Chapter 1.

General details about the function, operation, assembly and commissioning of the SIPROTEC devices you find in the

- SIPROTEC4 System Manual, order no. E50417–H1176–C151.

Modbus communication profile documentation

The following additional manual informs you about the data types, bus specific parameters and hardware inteface of the Modbus slave modul of the SIPROTEC devices:

Manual	Order number
SIPROTEC Communication module, Modbus - Communication profile	C53000-L1840-C001-03

Modbus specification

The Modbus specification with a detailed explanation of the Modbus protocol is contained in:

- MODICON
  Modbus Protocol
  Reference Guide
  PI-MBUS-300 Rev. J
  June 1996, Modicon, Inc.

Validity

This manual is valid for the SIPROTEC devices:

- 7VE61, 7VE63 (firmware version 4.0 or higher),

with

- Modbus communication module version 03.00.04 or higher.

For device parameterization have to be used:

- DIGSI 4.3 or higher,
- Modbus standard mappings 3-n
  (n = device type dependent number of standard mappings).

Additional Support

For questions regarding SIPROTEC4 devices, please contact your Siemens representative.

Training courses

Individual course offerings may be found in our Training Catalog and questions can be directed to our Training Centre. Please contact your Siemens representative.

Target audience

Protection engineers, commissioning engineers, personnel concerned with adjustment, checking and service of selective protective equipment, automatic and control facilities and personnel of electrical facilities and power plants.

Warning!

During operation of electrical equipment, certain parts of these devices are under high voltage. Severe personal injury or significant equipment damage could result from improper behaviour.

Only qualified personnel should work on this equipment or in the vicinity of this equipment. These personnel must be familiar with all warnings and service procedures described in this manual, as well as with safety regulations.

Prerequisites to proper and safe operation of this product are proper transport, proper storage, setup, installation, operation, and maintenance of the product, as well as careful operation and servicing of the device within the scope of the warnings and instructions of this manual.

In particular, the general facility and safety regulations for work with high-voltage equipment (e.g. ANSI, IEC, EN, or other national or international regulations) must be observed. Noncompliance may result in death, injury or significant equipment damage.

QUALIFIED PERSONNEL

Within the meaning of safety precautions of this manual and the instructions, qualified personnel are those persons who are qualified to set up, install, place into service, and operate this device, and who possess the following qualifications:

- Training and instruction (or other qualification) for switching, grounding, and designating devices and systems.
- Training or instruction in accordance with safety standards for care and use of certain safety equipment.

First aid training.

Typographic and graphical conventions

The following text formats are used to identify concepts giving device information described by the text flow:

`Parameter names`, or identifiers for configuration or function parameters that appear in the device display or on the screen of a PC (with DIGSI) are shown in mono-script (same point size) bold text. This also applies to header bars for selection menus.

`Parameter conditions`, or possible settings of parameters that appear in the device display or on the screen of a PC (with DIGSI), are additionally shown in italic style. This also applies to selection items for selection menus.

„`Annunciations`“, or identifiers for information produced by the device or required by other devices or from the switchgear is shown in mono-script (same point size) and placed into quotation marks.

For diagrams in which the identifier type results from the representation itself, text conventions may differ from the above-mentioned.

Revision index

Listing of the changes between the editions of this manual:

Modified chapters / pages	Edition	Reasons of modification
	1.0	First edition, Doc.-No.: C53000-L1840-C017-03 July 30th, 2003

Table of contents

Modbus register map

1

This chapter describes the register map organization of the Modbus slave of the SIPROTEC devices 7VE61, 7VE63.

1.1 Explanations

Note:

The examples shown in this chapter 1.1 do not necessarily correspond to the real allocation of the objects in the register mapping.

Chapters 1.2 to 1.5 define the mapping of the data objects of the SIPROTEC devices 7VE61, 7VE63 to the associated Modbus registers.

The columns "Designation of the SIPROTEC objects" contain the texts of the SIPROTEC objects for `"US English"` device language.

The listed SIPROTEC data objects are *sorted by register numbers* (starting with 1), e.g.:

Register	Designation of the SIPROTEC objects	Comments	Scaling (32767corresponds to...)	Internal object no.
30001	V1 =	Measured value V1	3276,7 V	25044

The measured value `"V1"` is assigned to register 30001 (Input register).

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
10017	25 MonTimeExc	1 = 25 Monitoring time exceeded	222.2025.01

The single-point indication `“25 MonTimeExc”` is assigned to the Input Status register 10017.

Note:

- The description of the standard mappings contains the pre-allocation of the mapping files *at delivery or at first assignment* of a mapping in DIGSI to the SIPROTEC device.
- Changes of the allocation and the scaling of the measured values are possible in adaptation to the concrete installation enviroment.
  You find information about this in the manual "SIPROTEC Communication module, Modbus - Communication profile" (ref. to page i).
- The definition of the data types (single-point indication, measured value etc.) are contained in the manual "SIPROTEC Communication module, Modbus - Communication profile" (ref. to page i).

1.2 Coil Status registers (0X references)

The Coil Status register block allows the Modbus master:

- command outputs through the output relays of the SIPROTEC device (external commands),
- manipulation of taggings (internal commands),
- reading the checkback indication and/or the status of output relays as well as taggings.

Note:

- The allocation of the output relays to the switching devices and to the output channels is defined during parameterization of the SIPROTEC devices.
- Depending on the device composition there may be less than indicated output relays (and corresponding Modbus registers) available in the SIPROTEC device.

1.2.1 Registers 00001 to 00044: Single commands (with checkback indication)

- User-defined single commands with checkback indication or taggings can be routed on these position as “Source/Destination system interface” using the **DIGSI Configuration matrix**.

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
00001	<user-defined>	not pre-allocated	-
00002	<user-defined>	not pre-allocated	-
00003	<user-defined>	not pre-allocated	-
00004	<user-defined>	not pre-allocated	-
00005	<user-defined>	not pre-allocated	-
00006	<user-defined>	not pre-allocated	-
00007	<user-defined>	not pre-allocated	-
00008	<user-defined>	not pre-allocated	-
00009	<user-defined>	not pre-allocated	-
00010	<user-defined>	not pre-allocated	-
00011	<user-defined>	not pre-allocated	-
00012	<user-defined>	not pre-allocated	-
00013	<user-defined>	not pre-allocated	-
00014	<user-defined>	not pre-allocated	-
00015	<user-defined>	not pre-allocated	-
00016	<user-defined>	not pre-allocated	-
00017	<user-defined>	not pre-allocated	-
00018	<user-defined>	not pre-allocated	-
00019	<user-defined>	not pre-allocated	-

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
00020	<user-defined>	not pre-allocated	-
00021	<user-defined>	not pre-allocated	-
00022	<user-defined>	not pre-allocated	-
00023	<user-defined>	not pre-allocated	-
00024	<user-defined>	not pre-allocated	-
00025	<user-defined>	not pre-allocated	-
00026	<user-defined>	not pre-allocated	-
00027	<user-defined>	not pre-allocated	-
00028	<user-defined>	not pre-allocated	-
00029	<user-defined>	not pre-allocated	-
00030	<user-defined>	not pre-allocated	-
00031	<user-defined>	not pre-allocated	-
00032	<user-defined>	not pre-allocated	-
00033	<user-defined>	not pre-allocated	-
00034	<user-defined>	not pre-allocated	-
00035	<user-defined>	not pre-allocated	-
00036	<user-defined>	not pre-allocated	-
00037	<user-defined>	not pre-allocated	-
00038	<user-defined>	not pre-allocated	-
00039	<user-defined>	not pre-allocated	-
00040	<user-defined>	not pre-allocated	-
00041	<user-defined>	not pre-allocated	-
00042	<user-defined>	not pre-allocated	-
00043	<user-defined>	not pre-allocated	-
00044	<user-defined>	not pre-allocated	-

1.2.2 Registers 00045 to 00048: Internal commands

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
00045	Command: Setting Group A	0 = not permitted 1 = Activation of setting group A	-
	Indication: Setting Group A	0 = Setting group A is not active 1 = Setting group A is active	
00046	Command: Setting Group B	0 = not permitted 1 = Activation of setting group B	-
	Indication: Setting Group B	0 = Setting group B is not active 1 = Setting group B is active	
00047	Command: Setting Group C	0 = not permitted 1 = Activation of setting group C	-
	Indication: Setting Group C	0 = Setting group C is not active 1 = Setting group C is active	
00048	Command: Setting Group D	0 = not permitted 1 = Activation of setting group D	-
	Indication: Setting Group D	0 = Setting group D is not active 1 = Setting group D is active	

Changing the setting group:

- In order to change the setting group, the value "1" = ON must be transmitted to the corresponding register.
- Switching ON one setting group automatically switches OFF the current active setting group.
- Transmission of the value "0" = OFF is insignificant for the change of the setting group and is refused by the device.

Note:

A change of the setting group is only possible via Modbus if the parameter **Change to Another Setting Group** (parameter address = 302) has the value ***Protocol***.

1.2.3 Registers 00049 to 00052: Double commands (with checkback indication)

- User-defined double commands with double-point indication as checkback indication can be routed on these position as “Source/Destination system interface” using the **DIGSI Configuration matrix**.
- Ref. to chap. “Double command / Double-point indication” in the manual “SIPROTEC Communication module, Modbus - Communication profile” for additional notes regarding controlling of double commands.

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
00049	<user-defined> ON	not pro-allocated	-
00050	<user-defined> OFF		
00051	<user-defined> ON	not pro-allocated	-
00052	<user-defined> OFF		

1.2.4 Registers Registers 00257 to 00264: Exception Flags

- Registers are write-protected.[1]
- The contents of these registers is also readable using function "Read Exception Status" (function code 7).
- Installation-specific SIPROTEC objects can be routed on these register positions using parameterization system DIGSI.

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
00257	<user-defined>	not pre-allocated	-
00258	<user-defined>	not pre-allocated	-
00259	<user-defined>	not pre-allocated	-
00260	<user-defined>	not pre-allocated	-
00261	<user-defined>	not pre-allocated	-
00262	<user-defined>	not pre-allocated	-
00263	<user-defined>	not pre-allocated	-
00264	<user-defined>	not pre-allocated	-

1. A write access is rejected with exception code 03 (ILLEGAL_DATA_VALUE).

1.3 Input Status registers (1X references)

The Input Status register block allows the Modbus master to scan the current status of the input channels as well as the annunciations generated in the SIPROTEC device (e.g. protection annunciations, status annunciations).

Note:

- The allocation of the input channels to the binary inputs is defined during parameterization of the devices.
- Depending on the device composition and the existing protection packages not all of the indicated binary inputs or protection annunciations (and corresponding Modbus registers) may be available in the SIPROTEC device.

1.3.1 Registers 10001 to 10016: Single-point indications, taggings

- Further protection annunciations, single-point indications and taggings (internal single-point indications) can be routed on these register positions as “Destination system interface” using the **`DIGSI Configuration matrix`**.

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
10001	<user-defined>	not pre-allocated	-
10002	<user-defined>	not pre-allocated	-
10003	<user-defined>	not pre-allocated	-
10004	<user-defined>	not pre-allocated	-
10005	<user-defined>	not pre-allocated	-
10006	<user-defined>	not pre-allocated	-
10007	<user-defined>	not pre-allocated	-
10008	<user-defined>	not pre-allocated	-
10009	<user-defined>	not pre-allocated	-
10010	<user-defined>	not pre-allocated	-
10011	<user-defined>	not pre-allocated	-
10012	<user-defined>	not pre-allocated	-
10013	<user-defined>	not pre-allocated	-
10014	<user-defined>	not pre-allocated	-
10015	<user-defined>	not pre-allocated	-
10016	<user-defined>	not pre-allocated	-

1.3.2 Registers 10017 to 10029: Error messages synchronization

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
10017	25 MonTimeExc	1 = 25 Monitoring time exceeded	222.2025.01
10018	25 FG-Error	1 = 25 Multiple selection of func-groups	222.2096.01
10019	25 Fail.Conf.	1 = 25 Failure in Configuration	222.2331.01
10020	25 sup.asym.	1 = 25-supervision V1,V2 asymmetrical	222.2309.01
10021	25 sup. α	1 = 25-supervision Alpha>	222.2310.01
10022	25-1 PaErr	1 = 25-group 1: Parameter not plausible	170.2097.01
10023	25-2 PaErr	1 = 25-group 2: Parameter not plausible	170.2097.02
10024	25-3 PaErr	1 = 25-group 3: Parameter not plausible	170.2097.03
10025	25-4 PaErr	1 = 25-group 4: Parameter not plausible	170.2097.04
10026	25-5 PaErr	1 = 25-group 5: Parameter not plausible	170.2097.05
10027	25-6 PaErr	1 = 25-group 6: Parameter not plausible	170.2097.06
10028	25-7 PaErr	1 = 25-group 7: Parameter not plausible	170.2097.07
10029	25-8 PaErr	1 = 25-group 8: Parameter not plausible	170.2097.08

1.3.3 Registers 10030 to 10095: Synchronization

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
10030	25-1 activ	1 = 25 Function group 1 is active	170.2311.01
10031	25-2 activ	1 = 25 Function group 2 is active	170.2311.02
10032	25-3 activ	1 = 25 Function group 3 is active	170.2311.03
10033	25-4 activ	1 = 25 Function group 4 is active	170.2311.04
10034	25-5 activ	1 = 25 Function group 5 is active	170.2311.05
10035	25-6 activ	1 = 25 Function group 6 is active	170.2311.06
10036	25-7 activ	1 = 25 Function group 7 is active	170.2311.07
10037	25-8 activ	1 = 25 Function group 8 is active	170.2311.08
10038	25-1 meas.	1 = 25-group 1: measurement in progress	170.2022.01
10039	25-2 meas.	1 = 25-group 2: measurement in progress	170.2022.02
10040	25-3 meas.	1 = 25-group 3: measurement in progress	170.2022.03
10041	25-4 meas.	1 = 25-group 4: measurement in progress	170.2022.04
10042	25-5 meas.	1 = 25-group 5: measurement in progress	170.2022.05
10043	25-6 meas.	1 = 25-group 6: measurement in progress	170.2022.06
10044	25-7 meas.	1 = 25-group 7: measurement in progress	170.2022.07
10045	25-8 meas.	1 = 25-group 8: measurement in progress	170.2022.08
10046	25-1 BLOCK	1 = 25-group 1 is BLOCKED	170.0051.01
10047	25-2 BLOCK	1 = 25-group 2 is BLOCKED	170.0051.02

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
10048	25-3 BLOCK	1 = 25-group 3 is BLOCKED	170.0051.03
10049	25-4 BLOCK	1 = 25-group 4 is BLOCKED	170.0051.04
10050	25-5 BLOCK	1 = 25-group 5 is BLOCKED	170.0051.05
10051	25-6 BLOCK	1 = 25-group 6 is BLOCKED	170.0051.06
10052	25-7 BLOCK	1 = 25-group 7 is BLOCKED	170.0051.07
10053	25-8 BLOCK	1 = 25-group 8 is BLOCKED	170.0051.08
10054	25 V1>V2<	1 = 25 Condition V1> V2< fulfilled	222.2027.01
10055	25 V1<V2>	1 = 25 Condition V1< V2> fulfilled	222.2028.01
10056	25 V1<V2<	1 = 25 Condition V1< V2< fulfilled	222.2029.01
10057	25 Vdiff ok	1 = 25 Voltage difference (Vdiff) okay	222.2030.01
10058	25 fdiff ok	1 = 25 Frequency difference (fdiff) okay	222.2031.01
10059	25 αdiff ok	1 = 25 Angle difference (alphadiff) okay	222.2032.01
10060	25 f1>>	1 = 25 Frequency f1 > fmax permissible	222.2033.01
10061	25 f1<<	1 = 25 Frequency f1 < fmin permissible	222.2034.01
10062	25 f2>>	1 = 25 Frequency f2 > fmax permissible	222.2035.01
10063	25 f2<<	1 = 25 Frequency f2 < fmin permissible	222.2036.01
10064	25 V1>>	1 = 25 Voltage V1 > Umax permissible	222.2037.01
10065	25 V1<<	1 = 25 Voltage V1 < Umin permissible	222.2038.01
10066	25 V2>>	1 = 25 Voltage V2 > Umax permissible	222.2039.01
10067	25 V2<<	1 = 25 Voltage V2 < Umin permissible	222.2040.01
10068	25 V2>V1	1 = 25 Vdiff too large (V2>V1)	222.2090.01
10069	25 V2<V1	1 = 25 Vdiff too large (V2<V1)	222.2091.01
10070	25 f2>f1	1 = 25 fdiff too large (f2>f1)	222.2092.01
10071	25 f2<f1	1 = 25 fdiff too large (f2<f1)	222.2093.01
10072	25 α2>α1	1 = 25 alphadiff too large (α2>α1)	222.2094.01
10073	25 α2<α1	1 = 25 alphadiff too large (α2<α1)	222.2095.01
10074	25 synchron 1	1 = 25 Synchronization condition 1 okay	222.2302.01
10075	25 synchron 2	1 = 25 Synchronization condition 2 okay	222.2303.01
10076	25 CloseRel 1	1 = 25 Release of Close Command 1-1	170.2300.01
10077	25 CloseRel 2	1 = 25 Release of Close Command 2-1	170.2301.01
10078	25 CloseRel 1	1 = 25 Release of Close Command 1-2	170.2300.02
10079	25 CloseRel 2	1 = 25 Release of Close Command 2-2	170.2301.02
10080	25 CloseRel 1	1 = 25 Release of Close Command 1-3	170.2300.03
10081	25 CloseRel 2	1 = 25 Release of Close Command 2-3	170.2301.03
10082	25 CloseRel 1	1 = 25 Release of Close Command 1-4	170.2300.04
10083	25 CloseRel 2	1 = 25 Release of Close Command 2-4	170.2301.04
10084	25 CloseRel 1	1 = 25 Release of Close Command 1-5	170.2300.05
10085	25 CloseRel 2	1 = 25 Release of Close Command 2-5	170.2301.05

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
10086	25 CloseRel 1	1 = 25 Release of Close Command 1-6	170.2300.06
10087	25 CloseRel 2	1 = 25 Release of Close Command 2-6	170.2301.06
10088	25 CloseRel 1	1 = 25 Release of Close Command 1-7	170.2300.07
10089	25 CloseRel 2	1 = 25 Release of Close Command 2-7	170.2301.07
10090	25 CloseRel 1	1 = 25 Release of Close Command 1-8	170.2300.08
10091	25 CloseRel 2	1 = 25 Release of Close Command 2-8	170.2301.08
10092	25 V2 down	1 = 25 decrease voltage V2	222.2324.01
10093	25 V2 up	1 = 25 increase voltage V2	222.2325.01
10094	25 f2 down	1 = 25 decrease frequency f2	222.2326.01
10095	25 f2 up	1 = 25 increase frequency f2	222.2327.01

1.4 Input registers (3X references)

The Input register block allows the Modbus master to read the values of the the analog inputs of the SIPROTEC device (recorded measured values).

Note:

- Depending on the device composition not all of the indicated analog inputs (and corresponding Modbus registers) may be available in the SIPROTEC device.
- The pre-allocated measured values are transferred as secondary values per default.
- Changes of the scaling of the measured values are possible in adaption to the concrete installation environment.
  You find information about this in the manual “SIPROTEC Communication module, Modbus - Communication profile” (ref. to page i).

Register	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
30001	V1 =	Measured value V1	3276,7 V	25044
30002	V2 =	Measured value V2	3276,7 V	25045
30003	f1 =	Measured value f1	327,67 Hz	25046
30004	f2 =	Measured value f2	327,67 Hz	25047
30005	dU =	Measured value dU	3276,7 V	25048
30006	df =	Measured value df	327,67 Hz	25049
30007	dα =	Measured value dα	3276,7 °	25050
30008	<user-defined>	not pre-allocated	-	-
30009	<user-defined>	not pre-allocated	-	-
30010	<user-defined>	not pre-allocated	-	-
30011	<user-defined>	not pre-allocated	-	-
30012	<user-defined>	not pre-allocated	-	-
30013	<user-defined>	not pre-allocated	-	-

1.5 Holding registers (4X references)

The Holding register block allows the Modbus master:

- query of system and diagnostic information, statistic values as well as min/max values,
- time synchronization of the SIPROTEC device and
- reading the Event recorder (Sequence of Events).

1.5.1 Registers 40001 to 40036: System information

- Registers are write-protected.[1]

Register	Designation of the SIPROTEC objects	Comments
40001 - 40008	Hardware designation of the communication module (string, max. 16 characters)	"AME-GEN" for AME module, "AMO-GEN" for AMO module
40009 - 40010	Communication module software revision	Example: Register 40009 = 0001H, register 40010 = 0205H → Revision 1.2.5
40011 - 40026	MLFB (order number) of the SIPROTEC device (string, max. 32 characters)	Example: "7VE61105EB910DB1----0D----------"
40027 - 40034	Date and time of mapping data generation (string, max. 16 characters)	Example: "170203095747330" corresponds to → Date: Feb. 17th, 2003 → Time: 09 hours, 57 min., 47 sec. and 330 milliseconds
40035 - 40036	Number of selected standard mapping, Revision of mapping data	MSB of register 40035: → Number of selected standard mapping LSB of register 40035 and value of register 40036: → Revision of mapping data Example: Register 40035 = 3102H, register 40036 = 0304H → Standard mapping 3-1, Revision 2.3.4

1. A write access is rejected with exception code 03 (ILLEGAL_DATA_VALUE).

1.5.2 Registers 40065 to 40069: Time synchronization

- Ref. to chap. “Time synchronization” in the manual “SIPROTEC Communication module, Modbus - Communication profile” for additional notes regarding methods of time synchronization and Time/Date data type.

Register	Designation of the SIPROTEC objects	Comments
40065	Milliseconds	Time/Date transfer registers
40066	Hours / Minutes	
40067	Month / Day	
40068	Time/Date status byte / Year	
40069	“Set Time and Date”	available only, if time synchronization is configured with use of the “Set Time and Date” register

1.5.3 Register 40129: Diagnosis

- Registers are write-protected.[1]
- The contents of this register is also readable using function "Diagnostics" (function code 7), subfunction "Return Diagnostic Register" (subfunction code 2).
- Ref. to chap. “Bus specific parameters” in the manual “SIPROTEC Communication module, Modbus - Communication profile” regarding signalization of “Data invalid” (register 40129/2^{15}).

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
40129/2^0	Device OK	1 = Update of the device replica in the SIPROTEC device completed after initial start or restart	51
40129/2^1	ProtActive	1 = At Least one protection function is active	52
40129/2^2	<user-defined>	not pre-allocated	-
40129/2^3	Error Sum Alarm	1 = Error with a summary alarm ON	140
40129/2^4	Alarm Sum Event	1 = Alarm summary event ON	160
40129/2^5	Relay PICKUP	1 = Relay PICKUP (group signal)	501
40129/2^6	Relay TRIP	1 = Relay GENERAL TRIP command	511
40129/2^7	<user-defined>	not pre-allocated	-
40129/2^8	<user-defined>	not pre-allocated	-
40129/2^9	<user-defined>	not pre-allocated	-
40129/2^{10}	<user-defined>	not pre-allocated	-
40129/2^{11}	<user-defined>	not pre-allocated	-
40129/2^{12}	<user-defined>	not pre-allocated	-
40129/2^{13}	<user-defined>	not pre-allocated	-
40129/2^{14}	<user-defined>	not pre-allocated	-
40129/2^{15}	Data invalid	1 = Data in the Modbus message are invalid. (This indication is created by the Modbus slave; not available in DIGSI and not relocatable.)	-

1. A write access is rejected with exception code 03 (ILLEGAL_DATA_VALUE).

1.5.4 Registers 40301 to 40316: Statistic values

- Registers are write-protected.[1]
- Installation-specific statistic values can be routed on these register positions as “Destination system interface” using the **DIGSI Configuration matrix**.

Register	Designation of the SIPROTEC objects	Comments	Internal object no.
40301 - 40302	<user-defined>	not pre-allocated	-
40303 - 40304	<user-defined>	not pre-allocated	-
40305 - 40306	<user-defined>	not pre-allocated	-
40307 - 40308	<user-defined>	not pre-allocated	-

1. A write access is rejected with exception code 03 (ILLEGAL_DATA_VALUE).

1.5.5 Registers 40351 to 40520: Min/Max values of measured values

- Registers are write-protected.[1]
- Min/Max values can be routed on these register positions as “Destination system interface” using the **DIGSI Configuration matrix**.
- Information regarding the Time/Date data type you find in the manual “SIPROTEC Communication module, Modbus - Communication profile” (ref. to page i).

Register	Designation of the SIPROTEC objects	Comments	Scaling (32767 corresponds to ...)	Internal object no.
40351	<user-defined>	not pre-allocated	-	-
40352 - 40355	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40356	<user-defined>	not pre-allocated	-	-
40357 - 40360	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40361	<user-defined>	not pre-allocated	-	-
40362 - 40365	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40366	<user-defined>	not pre-allocated	-	-
40367 - 40370	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40371	<user-defined>	not pre-allocated	-	-
40372 - 40375	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40376	<user-defined>	not pre-allocated	-	-
40377 - 40380	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40381	<user-defined>	not pre-allocated	-	-
40382 - 40385	Time/Date	Time and Date of the <user-defined> Min/Max value	-	
40386	<user-defined>	not pre-allocated	-	-
40387 - 40390	Time/Date	Time and Date of the <user-defined> Min/Max value	-	

1. A write access is rejected with exception code 03 (ILLEGAL_DATA_VALUE).

1.5.6 Registers 40601 to 40626: Event recorder (Sequence of Events)

- Registers are write-protected (with the exception of “SOE_Control”).[1]
- Information regarding the individual information in the handshake register, the data type “Message block” and the evaluation of Event recorder entries you find in the manual “SIPROTEC Communication module, Modbus - Communication profile” (ref. to page i).
- Only the annunciation “Data invalid” (ref. to chap. 1.5.3) is routed per default to the Event recorder.
  Further annunciations can be added to the Event recorder using DIGSI (ref. to chap. “Customization of the allocations” in the manual “SIPROTEC Communication module, Modbus - Communication profile”).

Register	Designation	Comments
40601	No. of Event recorder entries	Number of Event recorder entries which still were not read
40602	“SOE_Control”	Handshake register (read/write access)
40603	Message block #1	Register type / Bit offset #1
40604		Register address #1
40605		Message cause / Indication type #1
40606		Value #1
40607 - 40610		Time stamp #1
40611	Message block #2	Register type / Bit offset #2
40612		Register address #2
40613		Message cause / Indication type #2
40614		Value #2
40615 - 40618		Time stamp #2
40619	Message block #3	Register type / Bit offset #3
40620		Register address #3
40621		Message cause / Indication type #3
40622		Value #3
40623 - 40626		Time stamp #3

1. A write access is rejected with exception code 03 (ILLEGAL_DATA_VALUE).

Glossary

AME	Universal asynchronous communication module with (electrical) isolated RS485 interface for the SIPROTEC devices from Siemens.
AMO	Universal asynchronous communication module with fibre-optical interface for the SIPROTEC devices from Siemens.
CFC	Continuous Function Chart
CRC	Cyclical Redundancy Check
DC	Double Command
DIGSI	Parameterization system / parameterization software for SIPROTEC devices
DP	Double-point indication
Input data / Input direction	Data from the Modbus slave to the Modbus master.
LRC	Longitudinal Redundancy Check
LSB	Least Significant Byte
Mapping	Allocation of the SIPROTEC data objects to the positions in the Modbus register map.
MSB	Most Significant Byte
Output data / Output direction	Data from the Modbus master to the Modbus slave.
SC	Single command
SP	Single-point indication

Index

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Dear reader,

printing errors can never be entirely eliminated: therefore, should you come across any when reading this manual, kindly enter them in this form together with any comments or suggestions for improvement that you may have.

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