Ontrac®

For Profibus DP Communication

Instruction

(for actuators with software above Rev. 2.00)

42-78-104 EN

Ontrac

Content

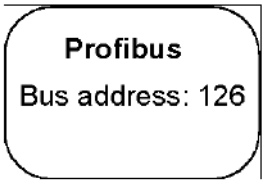
1. Device Identification

1.1 Data label

Ontrac®	Actuator: Ontrac MME.../...
No:	Year
M = ...	n = ...
T = -25 ...60°C	IP67
Oil: Mobil SHC 629	
U = 340V...440V 3PH	f=50/60 Hz, +/- 5%
Pmax = Imax=	S4 - 25%; max. 1200 c/h
Fuse 3 x 16 A slow	
SW Version > 2.00	
Minimum of Mmax= , nmax= 1/min	
M open = %	M close= %
n open = %	n close= %
Made by Ontrac Product Based on Former ABB Technology	

line 1: actuator type
line 2: serial no. / year of construction
line 3: max. switch-off torque / max. output speed
line 4: permissible ambient temperature / protection classification
line 5: oil type
line 6: rated voltage range / perm. operating mode
line 7: power input / perm. mains frequency
line 8: external fuse
line 9: software index
line 10: switch-off torque (factory setting)
line 11: operating torque for OPEN / CLOSE (factory setting)
line 12: operating speed for OPEN / CLOSE (factory setting)

An additional label indicates the default bus address.
Replace this label, once the address is changed.



1.2 ID Label for Additional Gearing

(if available)

Manufacturer	
Type	
Input torque	Nm
Transmission ratio	
Output torque	Nm
Gearing No.	

line 1: gearing manufacturer
line 2: gearing type
line 3: perm. input torque
line 4: gearing transmission ratio
line 5: output torque

2.Communication

ONTRAC actuators are designed for cyclic data transfer via Profibus DP.
Use graphical user interface for parameter setting and configuration.

2.1 Software version

PROFIBUS DP communication requires software version >2.00 and a profibus pcb for the electronics.

2.2 Bus connection

Use only cables, which are specified for RS 485 type A acc. to profibus standard. The profibus cable is connected via the central actuator plug at the actuator (see fig. 4). The max. cable diameter is 1.5 mm^2.

2.3 Bus termination

The actuators are supplied with active bus termination.
Remove the internal bus termination if the actuator is are not the last participant in the bus line or if an external bus termination is used.

Please connect the cable according to the right cable colour.

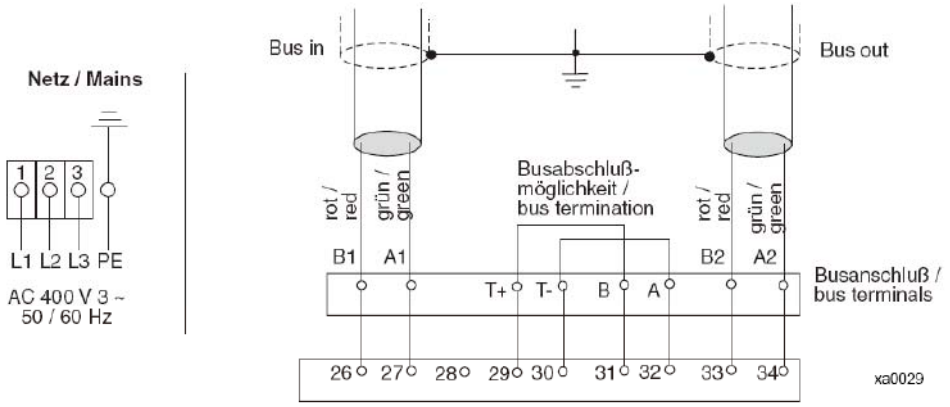


Fig. 4: Electrical connection (Profibus) diagram

Connect the screening at both ends acc. to cable and profibus specification RS-485 type "A".

2.4 Baud rate

ONTRAC supports a baud rate up to 1.5 MBit/s. ONTRAC detects and tunes the speed automatically.

3.Settings

3.1 Set-up of ONTRAC parameters

The entire set up for configuration, parameter setting and commissioning can be done with a graphical user interface via the infra red interface at the actuator. Operation-, diagnosis- and maintenance functions can be handled via this interface as well.

3.2 Set up of BUS-address

Unless other order specifications the default bus address is set to 126. Use the local control panel or the user interface for changes. The bus address can not be changed via fieldbus communication. Reset the actuator at the local control panel or via the user interface once the address is changed in order to activate the new settings.

4.Device data base file (GSD)

4.1 Ident No.

The Profibus User Organization assigned the ident no. 0x9657 to the Ontrac family.

4.2 GSD file

The device data base file and the device spec. sheet contains the data of the profibus DP device. Set up, content and codes are standardized. They allow for easy integration of the bus participant into the bus line.

The GSD-file for the ONTRAC actuators is named: Ontrac_9657.GSD. It is part of the actuator documentation and it is supplied together with the actuator.

Compare software release of electronic unit and GSD file prior to any use (see data label on electronic unit).

Contact the manufacturer in case of any deviations.

! Caution !

Do not change this file. The actuator manufacturer does not ensure the proper functions if the GSD file has been changed.

5.Module description

5.1 General

ONTRAC is defined as „Modular - Slave". The GSD-file allows for easy bus configuration for ONTRAC.

The GSD file provides communication modules from the manufacturer and modules defined in „PROFIBUS Profile PA (Actuator Class A)" .

ONTRAC supports this application by providung or calling these variables in the input and output section.

5.2 Status

An additional status byte is sent together with the position value. It provides information about the actuator referring to the position signal.

O.K.	(0x80) usual operation MAN/AUT, no failure
simulation	(0x60) actuator is in simulation mode
unsafe	(0x40) test function, simulation or position setting
bad	(0x00) failure

This additional information enables the DCS to react appropriately.

5.3 Module „STANDARD"

Module = "STANDARD" 0xC0,0x01,0x09
[IN 10 Byte, OUT 2 Byte]

Dir	Offset	Datentyp	Variable
IN	0	FLOAT	ReadbackValue
IN	4	BYTE	ReadbackStatus
IN	5	BYTE	PosDValue
IN	6	BYTE	PosDStatus
IN	7	INT16	IstDrehzahlValue
IN	9	BYTE	IstDrehzahlStatus
OUT	0	BYTE	SP_D Value
OUT	1	BYTE	SP_D Status

5.3.1Annotation to module „STANDARD":

ReadbackValue		current actuator position
ReadbackStatus		status of „ReadbackValue" object
PosDValuediscrete		actuator position
	0x00Hex	not adjusted
	0x01Hex	actuator is in „CLOSED" position
	0x02Hex	actuator is in „OPEN" position
	0x03Hex	actuator is between „OPEN" and„CLOSED"
PosDStatus		status of „PosDValue" object
Ist DrehzahlValue		current actuator RPM
Ist DrehzahlStatus		status of object „current rpm"
SP_DValue		discrete setpoint
	0x03 Hex	moving towards „OPEN"
	0x0C Hex	moving towards „CLOSED"
	0xC0 Hex	stop actuator
	0x30 Hex	acknowledgement
SP_Dstatus		status of object „SP_D" (to be provided when writing this object, to drive the actuator)

5.4 Module 1

Module code 0xC0,0x01,0x07
Input: 8 Byte
Output: 2 Byte

Dir	Offset	Data type	Variable
IN	0	FLOAT	ReadbackValue
IN	4	BYTE	ReadbackStatus
IN	5	BYTESTRING 3	Checkback
OUT	0	BYTE	SP_D Value
OUT	1	BYTE	SP_D Status

5.4.1Annotation to module 1:

ReadbackValue		current actuator position
ReadbackStatus		status of objects „ReadbackValue"
Checkback		actuator status
	0x000004	selector switch at local control panel in „LOCAL" position
	0x000010	actuator moves towards wrong direction
	0x000020	exceeding of torque limit for „OPEN"
	0x000040	exceeding of torque limit for „CLOSED"
	0x000100	actuator moves towards „OPEN"

	0x000200	actuator moves towards „CLOSED“
	0x000800	simulation is active
	0x010000	limit for max. actuator output turns exceeded
	0x040000	motor-/electronic unit temperature
	0x080000	end position failure
	0x100000	selector switch in „O/S“ (Out of Service) position
SP_DValue		discrete set point
	0x03 Hex	actuator moves towards „OPEN“
	0x0C Hex	actuator moves towards „CLOSED“
	0xC0 Hex	actuator stops
	0x30 Hex	acknowledgement
SP_DStatus		status of object „SP_DValue“ (to be provided when writing this object, to drive the actuator)

5.5 Module 2

Module code 0xC0; 0x01; 0x13
Input 20 Byte
Output 2 Byte

Dir	Offset	Data type	Variable
IN	0	FLOAT	ReadbackValue
IN	4	BYTE	ReadbackStatus
IN	5	BYTESTRING 3	checkback
IN	8	BYTE	PosDValue
IN	9	BYTE	PosDStatus
IN	10	BYTE	deviceReady
IN	11	BYTE	LocalSwitch
IN	12	FLOAT	TorqueValue
IN	16	BYTE	TorqueStatus
IN	17	INT16	IstDrehzahlValue
IN	19	BYTE	IstDrehzahlStatus
OUT	0	BYTE	SP_D Value
OUT	1	BYTE	SP_D Status

5.5.1Annotations to Module 2:

ReadbackValue		current actuator position
ReadbackStatus		status of object „ReadbackValue“
Checkback		actuator status
	0x000004	selector switch in „LOCAL“ position
	0x000010	actuator moves towards wrong direction
	0x000020	exceeding of torque limit for „OPEN“
	0x000040	exceeding of torque limit for „CLOSED“
	0x000100	actuator moves towards „OPEN“
	0x000200	actuator moves towards „CLOSED“
	0x000800	simulation it active
	0x010000	limit for max. actuator output turns exceeded
	0x040000	motor-/electronic unit temperature
	0x080000	end position failure
	0x100000	selector switch in „O/S“ (Out of Service) position
PosDValue		discrete actuator position
	0x00 Hex	not adjusted
	0x01 Hex	actuator in „CLOSED“ position
	0x02 Hex	actuator in „OPEN“ position
	0x03 Hex	actuator is between „OPEN“ and „CLOSED“ position
PosDStatus		status of object „PosDValue“
DeviceReady		operating status

	0x00	device not ready for operation
	0x01	device ready for operation
LocalSwitch		operating status of actuator
	0x00	selector switch at local control panel in „O/S“ position
	0x01	selector switch at local control panel in „LOCAL“ position
	0x02	selector switch at local control panel in „REMOTE“ position
TorqueValue		current actuator torque
TorqueStatus		status of object „TorqueValue“
Ist DrehzahlValue		current actuator rpm
Ist DrehzahlStatus		status of object „IstDrehzahl“
SP_DValue		discrete set point
	0x03 Hex	move towards „OPEN“
	0x0C Hex	move towards „CLOSED“
	0xC0 Hex	stop actuator
	0x30 Hex	acknowledgement
SP_Dstatus		status of object „SP_D“ (to be provided when writing this object, to drive the actuator)

5.6 new module for Ontrac MME actuator "Controller"

The additional module for ONTRAC MME actuators
Module = "Controller" 0xC0,0x04,0x06 [IN 7 Byte, OUT 5 Byte]

Dir	Offset	Data type	Variable
IN	0	Float	ReadbackValue
IN	5	Byte	ReadbackState
IN	6	Byte	Pos_D Value
IN	7	Byte	Pos_D State
OUT	0	Float	SetpointValue
OUT	5	Byte	SetpointStatus

5.6.1Annotations to Module "CONTROLLER":

ReadbackValue:		current actuator position
ReadbackStatus:		status of „ReadbackValue“ object
PosDValue:		discrete actuator position
	0x00 Hex	not adjusted
	0x01 Hex	actuator is in „CLOSED“ position
	0x02 Hex	actuator is in „OPEN“ position
	0x03 Hex	actuator is between „OPEN“ and „CLOSED“
PosDStatus:		status of „PosDValue“ object
SetpointValue:		actual setpoint
SetpointStatus:		status of object „SPStatus“ (to be provided when writing this object, to drive the actuator

5.6.2 Description of module "CONTROLLER"

This module is only available, if the mode SETPOINT is chosen in the actuator. Is another module choosen, the actuator sends "Bad Configuration" over the profibus to the master system. So it is guaranteed that the customer operate with the actuator in a bad configuration.
When the module "Controller" is configured, the actuator can only operate if an valid setpoint and a valid setpoint state is given over the profibus.
Is Setpointstate = 0x80 (State good) and the actuator in remote mode the Ontrac moves to a given setpoint.
When the setpointstate uneven 0x80 the actuator stops moving and holds at the last given valid setpoint.
Here a table with the different actuator types with the different modules. Only these configurations are possible.

Actuator	Operation mode	Module "Standard"	Module "Module1"	Module "Module2"	Module "Controller"	Drive with:
Ontrac MOE	ON/OFF	Ok	Ok	Ok	-/-	Digital setpoint "SP_D_Value";"SP_D_State
Ontrac MME	ON/OFF	Ok	Ok	Ok	-/-	Digital setpoint "SP_D_Value";"SP_D_State
Ontrac MME	SETPOINT	-/-	-/-	-/-	Ok	Setpoint "SetpointValue";"SetpointStatus"

6.Parameter setting of bus line

Pre-define the general and device specific parameters in order to set up the communication.
The GSD file contains all profibus parameters, supported by ONTRAC. Select the parameters acc. to the requirements.

6.1 DP-Slave for cyclic data transfer

The master provides a parameter telegram (PRM) for the bus communication and following to this the configuration data (CFG) e. g. the module STANDARD for in-/out data.

6.2 Configuration data

The higher extension stage of CFG allows for the selection of 2 modules. Further details are determined within the GSD file.

6.3 Parameter telegram

OCTET	Designation	Comment
1	MODE	Bit 0-2: reserved Bit 3: Watchdog On/Off Bit 4: Freeze On/Off Bit 5: Sync On/Off Bit 6: Unlock Bit 7: Lock
2	WD_FACT 1	definition of watchdog
3	WD_FACT 2	T[ms]= 10ms * WD_FACT1 * WD_FACT2
4	TSDR	time, the slave may answer at the earliest; must be shorter than TSDR
5	IDENT HIGH	0x96
6	IDENT LO	0x57
7	GROUP	group information
8	V1 extension	(extended watchdog definition)
9	V1 extension	
10	V1 extension	

6.4 Diagnosis

6.4.1Standard diagnosis telegram

Bit	OCTET 1
0	station not available (set by master)
1	Slave not ready for data exchange
2	CFG data do not match up
3	slave has set bit to indicate available diagnosis data
4	not supported
5	invalid response (always 0)
6	PRM data do not match up
7	slave parameterized by other master
Bit	**OCTET 2**
0	slave must be reparameterized
1	static diagnosis
2	fixed to 1
3	watchdog active
4	FREEZE command received
5	sync. command received
6	reserved
7	deactivated (set by master)
Info	**OCTET 3**
0	reserved
Info	**OCTET 4**
	master address or 0xFF
Info	**OCTET 5**
96 H	ident no. HI Byte
Info	**OCTET 6**
57 H	ident no. LOW Byte

6.4.2 Extended manufacturer specific diagnosis telegram

The OCTET's 9 - 16 transfer more detailed information about the occuring manufacturer specific diagnosis messages, which are displayed in OCTET 8. The explanations for Octets 8 - 16 are as follows:

Info	OCTET 7 (external)
10	no. of bytes external diagnosis bytes
	OCTET 8 (external)
21 H	communication to host disturbed
30 H	global alarm from actuator *Octet 15*: LO-byte *Octet 16*: HI-byte Unit_Diag_Bit(0) „battery discharged“ Unit_Diag_Bit(1) „change battery“ Unit_Diag_Bit(2) „torque limit for OPEN exceeded Unit_Diag_Bit(3) „torque limit for CLOSED exceeded“ Unit_Diag_Bit(4) „temperature motor“ Unit_Diag_Bit(5) „temperature Eelectronic unit“ Unit_Diag_Bit(6) „24_Volt“ Unit_Diag_Bit(7) „no. of output rev.“ Unit_Diag_Bit(8) „no. of switch-off cycles“ Unit_Diag_Bit(9) „motor-on time“ Unit_Diag_Bit(10 .. 14) „“ Unit_Diag_Bit(15) „collective alarm“
31 H	Global Fail from actuator Octet 13: LO-byte Octet 14: HI-byte Unit_Diag_Bit(0) „failure electronic unit“ Unit_Diag_Bit(1) „phase failure“ Unit_Diag_Bit(2) „motor temperature failure“ Unit_Diag_Bit(3) „electronic unit temperature failure“ Unit_Diag_Bit(4) „hand crank failure“ Unit_Diag_Bit(5) „end position failure“ Unit_Diag_Bit(6) „torque failure moving towards OPEN Unit_Diag_Bit(7) „torque failure moving towards CLOSE“ Unit_Diag_Bit(8) „no communication to actuator“ Unit_Diag_Bit(9 ... 14) „“ Unit_Diag_Bit(15) „collective failure“

7.Appendix (GSD file)

```
;===================================================================
; GSD-Datei for Ontrac
; Device: Ontrac
; Date:    07.05.2004
;===================================================================
; #Profibus_DP
GSD_Revision              = 2              ; DP
;---Manufacturer-----------------------------------------
Vendor_Name               = "Ontrac "
Model_Name                = "ONTRAC"


;---Revision---------------------------------------------------
Revision                  = "Version 2.00"

;---PNO Id-----------------------------------------------------
Ident_Number=0x9657

;---Protocol-Id------------------------------------------------
Protocol_Ident       = 0
Station_Type         = 0

;---FMS/DP-Universal Device------------------------------------
FMS_supp                  = 0
```

```
;---Hardware,Software Revision----------------------------------

Hardware_Release        = "1.02"       ; release of the DP device
Software_Release        = "1.44"

;---supports baud rates------------------------------------------
9.6_supp        = 1
19.2_supp       = 1
93.75_supp      = 1
187.5_supp      = 1
500_supp        = 1
1.5M_supp       = 1
3M_supp         = 0
6M_supp         = 0
12M_supp        = 0

;---max. response time at baud rate---------------------------
MaxTsdr_9.6       = 60
MaxTsdr_19.2      = 60
MaxTsdr_93.75     = 60
MaxTsdr_187.5     = 60
MaxTsdr_500       = 100
MaxTsdr_1.5M      = 100


Redundancy          = 0
Repeater_Ctrl_Sig   = 0          ;not supported
24V_Pins            = 0

;Implementation_Type = ""

Bitmap_Device     = "Ontrac_n"
Bitmap_Diag       = "Ontrac_d"
Bitmap_SF         = "Ontrac_s"

;*** Slave Keys ****************************************************

;---Freeze- und Sync-Mode ------------------------------------------
Freeze_Mode_supp    = 0
Sync_Mode_supp      = 0

Fail_Safe           = 0
Slave_Family=1@electrical@on-off        ; electrical ON-OFF actuator

;---Automatic baud rate detection---------------------------------
Auto_Baud_supp      = 1



;---Automatic slave-address assignment-------------------------------
Set_Slave_Add_supp = 0

;---Parameter Data-------------------------------------------
User_Prm_Data_Len    = 32
User_Prm_Data =
0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,0x0,
0x0,0x0,0x0,0x0,0x0

;---Min. clearnace Data_Exchange *100usec-------------------------
Min_Slave_Intervall = 20

;---Module for data access (not I/O-module)----------------------
```

```
Modular_Station        = 1

;---Max. data of CFG-----------------------------------------------
Max_Module              = 1
Max_Input_Len           = 20
Max_Output_Len          = 5
Max_Data_Len            = 22
Max_Diag_Data_Len       = 16

;---Manufacturer spec. diagnosis messages-----------------------------
;
; Octet 1-6 contain: standard diagnosis
; Octet 7 contain: length of extended diagnosis.
; Octet 8 of ext. diagnosis telegram contains: diagnosis-ID.
; Octets 9-12 contain: additional information for diagnosis-ID.
; Octet 13/14 contain: failure registry
; Octet 15/16 contain: alarm registry
;
; "Failure" (Octet 13,14) (bits 40-47, 48-55)
;
Unit_Diag_Bit(40) ="electronics failure"
Unit_Diag_Bit(41) ="phase breakdown"
Unit_Diag_Bit(42) ="motor temperature failure"
Unit_Diag_Bit(43) ="electronics temperature failure"
Unit_Diag_Bit(44) ="hand crank failure"
Unit_Diag_Bit(45) ="end position failure"
Unit_Diag_Bit(46) ="Empty"
Unit_Diag_Bit(47) ="Empty"
Unit_Diag_Bit(48) ="torque failure OPEN"
Unit_Diag_Bit(49) ="torque failure CLOSE"
Unit_Diag_Bit(50) ="Empty"
Unit_Diag_Bit(51) ="Empty"
Unit_Diag_Bit(52) ="Empty"
Unit_Diag_Bit(53) ="Empty"
Unit_Diag_Bit(54) ="Empty"
Unit_Diag_Bit(55) ="general failure"
;
;"Alarm"    (Octet 15,16) (Bits 56-63, 64-71)
;
Unit_Diag_Bit(56) ="battery empty"
Unit_Diag_Bit(57) ="battery change"
Unit_Diag_Bit(58) ="torque limit for OPEN exceeded"
Unit_Diag_Bit(59) ="torque limit for CLOSE exceeded"
Unit_Diag_Bit(60) ="temperature motor exceeded"
Unit_Diag_Bit(61) ="temperature elektronics exceeded"
Unit_Diag_Bit(62) ="add. 24 Volt failure"
Unit_Diag_Bit(63) ="no. of motor turns"
Unit_Diag_Bit(64) ="no. of torque switch-off cycles"
Unit_Diag_Bit(65) ="motor-on time exceeded"
Unit_Diag_Bit(66) ="empty"
Unit_Diag_Bit(67) ="empty"
Unit_Diag_Bit(68) ="empty"
Unit_Diag_Bit(69) ="empty"
Unit_Diag_Bit(70) ="empty"
Unit_Diag_Bit(71) ="general alarm"


;====DP-IDs=========================================================

;---ID of Ontrac Standard Module-------------------------------------
;
Module                  = "STANDARD" 0xC0,0x01,0x09
```

```
EndModule

;;    IN 10 Byte, OUT 2 Byte
;;IN       0          FLOAT          ReadbackValue
;;IN       4          BYTE           ReadbackStatus
;;IN       5          BYTE           PosDValue
;;IN       6          BYTE           PosDStatus
;;IN       7          INT16          IstDrehzahlValue
;;IN       9          BYTE           IstDrehzahlStatus
;;OUT      0          BYTE           SP_D Value
;;OUT      1          BYTE           SP_D Status

Module              = "Modul1" 0xC0,0x01,0x07
EndModule
;; IN 8 Byte, OUT 2 Byte
;;IN       0          FLOAT          ReadbackValue
;;IN       4          BYTE           ReadbackStatus
;;IN       5          BYTESTRING     Checkback
;;OUT      0          BYTE           SP_D Value
;;OUT      1          BYTE           SP_D Status

Module              = "Modul2" 0xC0,0x01,0x13
EndModule
;; IN 20 Byte, OUT 2 Byte
;;IN       0          FLOAT          ReadbackValue
;;IN       4          BYTE           ReadbackStatus
;;IN       5          BYTE           STRING checkback
;;IN       8          BYTE           PosDValue
;;IN       9          BYTE           PosDStatus
;;IN       10         BYTE           DeviceReady
;;IN       11         BYTE           LocalSwitch
;;IN       12         FLOAT          TorqueValue
;;IN       16         BYTE           TorqueStatus
;;IN       17         INT16          IstDrehzahlValue

;;N        19         BYTE           IstDrehzahlStatus
;;OUT      0          BYTE           SP_D Value
;;OUT      1          BYTE           SP_D Status

Module              = "Controller" 0xC0,0x04,0x06
EndModule
;; IN 7 Byte, OUT 5 Byte
;;
;; ReadbackValue                     IN      (Float4)
;; ReadbackStatus                    IN      (Byte)
;; POS_D Value                       IN      (Byte)
;; POS_D Status                      IN      (Byte)
;; SetpointValue                     OUT     (Float4)
;; SetpointStatus                    OUT     (Byte)
```

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