ORBIT® Protocol Description

Default RS485 configuration for ORBIT® protocol:
187'500 bauds
8 data bits
Odd parity
1 stop bit

ORBIT® Transactions

The master issues an ORBIT® command frame on the bus. The addressed slave may or may not answer, depending on the command. For further details about the ORBIT® protocol, refer to the Solartron© ORBIT® Protocol specifications.

ORBIT® Frames description

Command frame format

Break	Function code (1 byte)	Address (1 byte)	Data (0...n bytes)

Break: Break condition of RS485 line (at least 11 bits @ 0)
Function code: See the following table for supported functions
Address field: Slave address (ASCII 1...31, address zero is reserved for broadcast)
Data: 0…n bytes

Normal response frame format

Function code (1 byte)	Data (1…n bytes)

Exception response frame format

"!" (ASCII 0x21)	Exception code (1 byte)

Broadcast answer frame format

If the master issues a broadcast command, it doesn't expect an answer. The only exception is the Notify command "N" (see below).

Supported ORBIT® functions

Function code (ASCII)	Description	Command format	Answer format
B	Get Info	<break> "B" ADR	"B" 4-bytes-module-type 2-bytes-hardware-type 2-bytes-resol 32-bytes-info
C	Clear	<break> "C" ADR	"C" ADR
G	Get Status	<break> "G" ADR	"G" 1-byte-error 2-bytes-status
I	Identifiy	<break> "I" ADR	"I" 10-bytes-ID 12-bytes-dev-type 5-bytes-version 2-bytes-stroke
L	Read2	<break> "L" ADR	"L" 4-byte-probe-position
N	Notify	<break> "N" 0x00	"N" 10-bytes-ID (answer only if probe has moved more than 1mm)
P	Preset	<break> "P" ADR 4-bytes-preset	"P" ADR
R	Reset	<break> "R" 0x00	No answer (broadcast command)
S	Set Address	<break> "S" ADR 10-bytes-ID 0x00	"S" ADR
V	Set Mode	<break> "V" ADR 2-bytes-Mode 2-bytes-Argument	"V" ADR
W	Control	<break> "W" 1-byte-Action	No answer (broadcast command)

Exception code	Description
0x00	Normal
0x01	Parity error
0x03	Unknown command
0x04	Broadcast not allowed
0x05	Broadcast expected
0x06	Address change not allowed
0x09	Missing reading (bus is too slow)
0x0A	Reading not yet available (bus is too fast)
0x12	Underrange error
0x13	Overrange error
0x40	Invalid mode (of command "V")
0x60	Average value invalid
0xC4	Overspeed error

Status code	Description
0x0004	Positive direction
0x0300	Synchronization mode
0x0400	Sample mode
0x0800	New reading available

Note: Multibyte parameters start with LSB first

Device parameters

Commands	Parameters	Examples	Description
B	4-bytes-module-type 2-bytes-hardware-type 2-bytes-resol 32-bytes-info	"LE25" 0x0001 0x64 "V102P[-xx] 01.02.16" "MMR3D+D0F1"	Linear Encoder 25mm type 1 In multiples of 10nm -> 100 x 10nm = 1µm Firmware version[-options] date 2 characters for each of up to 7 options MM or IN or MO or IO (mm/inch or only) R2 or R3 or R_ (0.001µm/0.01µm/undefined) D+ or D- or D_ (Direction +/-/ undefined) D0 or D1 or D_ (Radius/Diameter/ undefined) F1 or F2 or F_ (Reference 1/2/ undefined)
G	1-byte-error 2-bytes-status		See Exceptions codes for 1-byte-error See Status codes for 2-bytes-status
I	10-bytes-ID 12-bytes-dev-type 5-bytes-version 2-bytes-stroke	"9#L1" "YYWWNN" "SYL289-LE095" "r102P" 0x19	Sylvac instrument + Year Week Number Sylvac PM289-Linear Encoder type .950 Firmware version Stoke in mm
L	"L" 4-byte-probe-position	0x002F EFD6	32 bits signed value
N	10-bytes-ID	"9#L1" "YYWWNN"	Sylvac instrument + Year Week Number (the instrument sends its ID only if the probe has moved more than 1mm)

Commands with parameters

Commands	Parameters	Description	
P	4-bytes-preset	A new 32 bits signed preset value expressed in units of resolution as defined by Get Info command.	
S	10-bytes-ID	If 10-bytes-ID matches the received ID, then the instrument stores the new address.	
V	2-bytes-mode 2-bytes-argument	Mode 0x0000: normal mode 0x000A: synchronized mode (not used) 0x0014: sampled mode 0x001E: capture (not used) 0x0032: set value	Argument averaging value : 1,16 or 256
W	1-byte-action	Action 0x00: clear buffer 0x01: start synchronization (not used) 0x02: stop synchronization (not used) 0x03: take and store a sample (read it with "L")	