Technical Notes
SIO-Commands

Pin	Description
1	RxD
2	TxD
3	GND, Ground
4	Battery +
5	CAN High
6	CAN Low

Firmware: 24.17
Update: 27.05.2025
Changes compared to FW 24.16 are marked in green

Content

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Command: ?

SFC>?

Description:

Help menu for public commands. Displays a list of possible commands.

Response:

Command	description
BAT	Manage battery.
CART	Manage fuel cartridge.
CTRL	Control system.
CYCLE	Display and manage cycle monitor database.
ERROR	Display recent error log entries.
ERRORSTAT	Display error statistic.
ETH	Control Ethernet.
FACTORY	Reset system to factory defaults.
FM	Control the fuel manager if present.
INFO	Display system information.
LIFE	Display lifetime log database.
LOG	Display system operating data.
RESET	Perform system reset.
REV	Display firmware revision.
RTC	Display or set UTC time and date.
SERIAL	Display system serial number.
TLP	Control and monitor transport protection.
UNLOCK	Unlock transport protection.
VER	Display firmware version.
WARNING	Display recent warning log entries.

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Command: BAT

SFC›BAT ‹ARGUMENT›

Description:

Set or view parameters of battery.

Possible transmission parameters:

Argument	Description
	Display parameters of the currently configured battery
(value)	Configure battery by: 1: Lead Acid 12V 2: Lead Acid 24V 3: LiFePO4 12V 4: LiFePO4 24V 5: EFOY Battery
LIST	Display all configurable batteries and their respective IDs.
LIMITS	Display minimum, maximum and default values for each configurable battery parameter of the currently configured battery.
DEFAULT	Reset all battery parameters except capacity to their default values.
BOC	Display currently configured begin of charge voltage (=switch-on voltage).
BOC LIMITS	Display configurable range of the begin of charge voltage (=switch-on-voltage).
BOC [value]	Configure begin of charge voltage (=switch-on-voltage) with a desired value.
EOC	Display currently configured end of charge voltage (=switch-off voltage).
EOC LIMITS	Display configurable range of the end of charge voltage (=switch-off voltage).
EOC [value]	Configure end of charge voltage (=switch-off voltage) with a desired value.
COC	Display currently configured cut-off current (=switch-off current).
COC LIMITS	Display configurable range of the cut-off current (=switch-off current).
COC [value]	Configure cut-off current (=switch-off current) with a desired value.
CAP	Display currently configured battery capacity.
CAP LIMITS	Display configurable range of battery capacity.
CAP [value]	Configure battery capacity with a desired value.
COT	Display currently configured full charge duration (=switch-off time).

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COTLIMITS	Display configurable range of the full charge duration (=switch-off time).
COT [value]	Configure full charge duration (=switch-off time) with a desired value in minutes.
MAXCT	Display currently configured maximum charge time.
MAXCT LIMITS	Display configurable range of the maximum charge time.
MAXCT [value]	Configure maximum charge time with a desired value in hours. Set to zero to disable maximum charge time.
MINCT	Display currently configured minimum charge time.
MINCT LIMITS	Display configurable range of the minimum charge time.
MINCT [value]	Configure minimum charge time with a desired value in minutes.
SOD	Display currently configured switch-on delay
SOD LIMITS	Display configurable range of switch-on delay.
SOD [value]	Configure switch-on delay with a desired value in seconds.
DDP	Display currently configured battery protection voltage.

Example 1
SFC›BAT

type: LiFePO4 12V
begin of charge voltage: 12.80V
end of charge voltage: 14.60V
cut off current: 0.50A
capacity: 105.00Ah
cut off time: 0min
maximum charge time: 25h
minimum charge time: 30min
switch on delay: 30s
deep discharge protection voltage: 11.90V
minimum voltage: 9.00V
maximum voltage: 16.00V
maximum manual on voltage: 13.40V

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Example 2
SFC›BAT LIST

0: No Battery
1: Lead Acid 12V
2: Lead Acid 24V
3: LiFePO4 12V
4: LiFePO4 24V
5: EFOY Battery

Example 3
SFC›BAT BOC 12.7

Ok

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Command: BAT INFO

Description:

Display operating values of a connected EFOY Battery. The command has no arguments.

Possible transmission parameters:

Argument	Description
	Display operating values of a connected EFOY Battery.
BatSoc	State of charge from the connected EFOY Battery
BatUClamp	Voltage measured at the clamps of the connected EFOY Battery
BatUChgMax	Maximum allowed charge voltage of the connected EFOY Battery
BatIChg	Charge current measured by the EFOY Battery
BatIChgMax	Maximum allowed charge current of the EFOY Battery
BatT	Temperature of the EFOY Battery
BatState	System state of the EFOY Battery 0 – battery may not be charged 1 – battery may be charged
BatCap	Total capacity of the EFOY Battery
BatCells	Number of battery cells in the EFOY Battery

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Command: CART

SFC›CART ‹ARGUMENT›

Description:

Configure the fuel cartridge and display information about the fuel cartridge.

Possible transmission parameter:

Argument	Description
	Display Information about the current fuel cartridge. Please see the following table for a detailed description.
RESET	Reset the cartridge fuel level to 100%. Causes fuel cartridge empty error to be reset.
RESET [0 to 100]	Set the cartridge fuel level to a desired value between 0% and 100%. Causes fuel cartridge empty error to be reset.
NONE	Configure unspecified fuel cartridge. Disables computation of fuel level.
CUSTOM [1 to 1000]	Configure fuel cartridge with custom capacity between 1l and 1000l.
M5	Configure fuel cartridge type M5 containing 5 litres.
M10	Configure fuel cartridge type M10 containing 10 litres.
M28	Configure fuel cartridge type M28 containing 28 litres.
MT60	Configure fuel cartridge type MT60 containing 60 litres.
FM	Configure fuel manager.

Example 1

SFC›CART M10
Ok

Example 2

SFC›CART
Cart 2n CartCap 5.00l CartFLV 5.00l CartFL 100.00%

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Designation	Description
Cart	Currently configured cartridge. 0: unspecified 1: fuel container with custom capacity 2: M5 3: M10 4: M28 5: MT60 6: FM
CartCap	Capacity of the currently configured cartridge.
CartFLV	Remaining absolute volume in the currently configured fuel cartridge.
CartFL	Remaining relative volume in the currently configured fuel cartridge.

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Command: CLUSTER

SFC›CLUSTER ‹ARGUMENT›

Description:

Configure cluster operation and display information regarding cluster operation.

Possible transmission parameters:

Argument	Description
	Display information regarding cluster operation. See possible values for output below.
ROLE	Display currently configured cluster role of the EFOY. 0: None / 1: Controller / 2: Client
ROLE LIST	Display the configurable role IDs and their short designation.
ROLE x	Configure cluster role of the EFOY in the cluster unit. Possible options for x are: 0: None / 1: Controller / 2: Client
IP	Display the currently configured IP address of the cluster controller. This is only relevant if the EFOY is configured as cluster client.
IP w.x.y.z	Configure the IP address of the cluster controller. This is only possible if the EFOY is configured as cluster client. The IP must be given as IPv4 in dot decimal notation, i.e. 192.168.172.10. The IP address 0.0.0.0 is not accepted.
MYIP	Display the IP address and subnet mask currently assigned to the EFOY.
PIN	Display the current pin. The pin “00000000” means there is no pin. If the EFOY is configured as cluster role “None”, or as cluster role “Controller”, display the cluster controller pin If the EFOY is configured as cluster role “Client” display the currently configured client pin.
PIN xxxxxxxx	Set the pin for the cluster client, only possible if the EFOY is configured as cluster role “Client”. Possible options for x, all numerals from 0 to 9. It is mandatory that the pin has eight digits. The combination of eight times “0” is not allowed (“00000000”). The lowest allowed number is “00000001”, the highest is “99999999”

Possible values for output:

Argument	Description
ClusterRole	Cluster role assigned to the EFOY. 0: None / 1: Controller / 2: Client
ClusterOpMode	Currently active cluster operation mode.

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ClusterClientCnt	Total number of cluster clients connected to the cluster controller. This value is only relevant if the EFOY is configured as cluster controller.

Example

SFC›CLUSTER
ClusterRole 1n ClusterOpMode 10n ClusterClientCnt 3n

SFC›CLUSTER ROLE
2

SFC›CLUSTER ROLE LIST
0 – None
1 – Controller
2 - Client

SFC›CLUSTER ROLE 1
Ok

SFC›CLUSTER IP
192.168.172.10

SFC›CLUSTER IP 192.168.172.20
Ok

SFC›CLUSTER MYIP
IPv4: 192.168.172.11
Mask: 255.255.0.0

SFC›CLUSTER PIN
ClusterPin 38251347

SFC›CLUSTER ROLE 2
Ok

SFC›CLUSTER PIN 01234567
Ok

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Command: CTRL

SFC›CTRL ‹ARGUMENT›

Description:

Changes the operation mode of the system.

Possible transmission parameters:

Argument	Description
ON	Turns system on. The system may not be turned on manually if the battery voltage is above the maximum manual on voltage (dependent on configured battery). Furthermore, the system may not be turned on manually if a connected fuel manager is inoperable due to an error.
OFF	Turns system to sleep-mode. System does not start charging operation automatically. If the system is currently running, it only shuts down after it ran for at least 30 minutes.
AUTO	Puts system in automatic standby mode. System will turn on automatically if the battery voltage falls below the configured begin of charge voltage (=switch-on voltage).

Example 1

SFC›CTRL ON
Ok

Note:
Whether the system may currently be turned on or off is reflected in the values SystemOnOk and SystemOffOk in the output off serial command LOG.

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Command: CYCLE

SFC›CYCLE ‹ARGUMENT›

Description:

Displays the database of all cycle monitoring units and manages the cycle monitor.

Possible transmission parameters:

Argument	Description
	Displays cycle monitor database.
RESETALL	Reset all cycle monitoring units. The values average duration, last duration and count are set to zero. The cumulated cycle durations are not reset. Causes battery degraded error to be reset.
RESETAUTO	Reset the automatic charge cycle monitoring unit. The values average duration, last duration and count are set to zero. The cumulated cycle duration is not reset. Causes battery degraded error to be reset.
RESETMAN	Reset the manual charge cycle monitoring unit. The values average duration, last duration and count are set to zero. The cumulated cycle duration is not reset.

Example 1

SFC›CYCLE

AutoAvg 162min AutoLast 214min AutoCum 6h AutoCnt 2n ManAvg 71min ManLast 6min ManCum 17h ManCnt 10n DDPAvg 0min DDPLast 0min DDPCum 0h DDPCnt 0n FPAvg 0min FPLast 0min FPCum 0h FPCnt 0n ErrAvg 11min ErrLast 2min ErrCum 0h ErrCnt 2n RstAvg 11min RstLast 13min RstCum 0h RstCnt 3n

The cycle monitor database contains the following values:

Designation	Description
AutoAvg	Average cycle duration of automatic cycles.
AutoLast	Last automatic cycle duration.
AutoCum	Total duration of all automatic cycles.
AutoCnt	Total number of automatic cycles.

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ManAvg	Average cycle duration of manual cycles.
ManLast	Last manual cycle duration.
ManCum	Total duration of all manual cycles.
ManCnt	Total number of manual cycles.
DDPAvg	Average cycle duration in deep discharge protection mode.
DDPLast	Last deep discharge protection cycle duration.
DDPCum	Total duration of all deep discharge protection cycles.
DDPCnt	Total number of cycles in deep discharge protection mode.
FPAvg	Average cycle duration in frost protection mode.
FPLast	Last frost protection cycle duration.
FPCum	Total duration of all frost protection cycles.
FPCnt	Total number of cycles in frost protection mode.
ErrAvg	Average duration of cycles aborted by an error.
ErrLast	Last duration of a cycle aborted by an error.
ErrCum	Total duration of all cycles aborted by an error.
ErrCnt	Total number of cycles aborted by an error.
RstAvg	Average duration of cycles aborted by a system reset.
RstLast	Last duration of a cycle aborted by a system reset.
RstCum	Total duration of all cycles aborted by a system reset.
RstCnt	Total number of cycles aborted by a system reset.

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Command: ERROR

SFC›ERROR

Description:

Displays the error log. The error log is presented in newest first order and without any argument, it displays the last 10 errors.

Each error has a major and minor error number, a time and date when the error happened and the operating time when the error occurred. This information is followed by information that is relevant to the error in the same formatting as in the log output.

Possible transmission parameters:

Argument	Description
	Without any arguments, the command displays up to the last ten errors.
[number] (e.g. 20)	The command displays up to number last errors from the log.

Example 1

SFC›ERROR

001.006 2020-11-26T15:57:02Z:
StackOpTime 25.3508h
001.006 2020-11-26T15:55:11Z:
StackOpTime 25.3508h

Example 2

SFC›ERROR 1

001.006 2020-11-26T15:57:02Z:
StackOpTime 25.3508h

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Command: ERRORSTAT

SFC›ERRORSTAT

Description:

Displays a table giving an overview of all errors and warnings that have occurred. Contains the information which errors or warnings have occurred (Code), how often they were set (Count), when the error or warning has occurred for the first time (First) and the last time (Last) and the operating hours when the error or warning occurred for the first and last time (StFirst and StLast).

Example 1

SFC›ERRORSTAT

Code	Count	First	Last	StFirst	StLast
001.001	1	2020-06-29T12:49:01Z	2020-06-29T12:49:01Z	0h	0h
001.002	1	2020-06-29T12:49:48Z	2020-06-29T12:49:48Z	0h	0h
050.004	48	2020-06-29T13:14:58Z	2020-11-10T18:28:56Z	0h	25h
020.002	1	2020-07-02T09:31:14Z	2020-07-02T09:31:14Z	7h	7h
020.001	1	2020-07-07T09:06:42Z	2020-07-07T09:06:42Z	7h	7h
050.002	13	2020-07-09T11:17:15Z	2020-11-26T15:55:21Z	7h	25h
011.001	1	2020-07-20T14:02:44Z	2020-07-20T14:02:44Z	8h	8h
001.003	1	2020-08-18T12:27:35Z	2020-08-18T12:27:35Z	8h	8h
001.006	26	2020-08-26T06:47:34Z	2020-11-26T15:57:02Z	17h	25h
195.001	5	2020-11-23T10:41:28Z	2020-11-23T13:17:31Z	25h	25h

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Command: ETH

SFC›ETH ‹ARGUMENT›

Description:

Displays or sets the Ethernet configuration.

Possible transmission parameters:

Argument	Description
	Display DHCP client state, IP, mask, gateway, hardware address, device name
DHCP [ON|OFF]	Turn DHCP client on or off. Renew DHCP with ON command.
SET ‹IP› ‹Mask› ‹Gateway›	Set the current IP configuration, DHCP must turned off before.
CLAIMING	Get claiming key if one is set and not expired.
MODBUS [ON [‹Port›]|OFF]	Caution: The mode opens an unsecure port into the network and thus requires a secure local network with firewall, otherwise there are great risks for attacks on the EFOY. Enables the unsecure Modbus mode at user defined port. (Default port is 502). EFOY must reset after turn off command to disable the Modbus mode or after changing the port.
CN	Common name (Device name)
RXER	Error counter, irrelevant to end user
LINK	Physical link and DCHP client state

Example 1

SFC›ETH

Ethernet cable connected
Connected to IoT Hub
DHCP client: On
IP: 10.1.6.56
Mask: 255.255.0.0
Gateway: 10.1.255.1
Hardware Address: E4:1E:0A:6F:AC:B1

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Command: FACTORY

SFC›FACTORY

Description:

Reset the system settings to factory defaults. The command only has an effect if the system is in sleep-mode, in standby or in transport protection.

A factory reset causes the battery configuration, the cycle monitor units, the fuel cartridge configuration and the Ethernet configuration to be reset to default.

Example 1
SFC‹FACTORY
Ok

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Command: FM

SFC›FM ‹ARGUMENT›

Description:

This function is used to configure and display specific information about the Fuel Manager.

Possible transmission parameters:

Argument	Description
	Display overview of the current Fuel Manager configuration
[Port number] RESET	Reset fuel level of the cartridge on port number.
[Port number] RESET [level]	Reset fuel level of the cartridge on port number to level.
[Port number] ENABLE	Enable the port to be used
[Port number] DISABLE	Disable the port to not be used.
[Port number] [Cartridge type]	Change cartridge to type.
[Port number] SELECT	Set the port "in use", that means the fuel cartridge port that methanol should be drawn from. The port must be enabled. It is not possible to select the "port in use" when using the fuel manager variant FM8, only when using the variants FM2 and FM4. It is also not possible to select the "port in use" while the FM pumps are active.
[Port number] CUSTOM [1 to 1000]	Configure fuel cartridge with custom capacity be-tween 1l and 1000l.
ERROR	Display the error log, it is presented in newest first order and it displays the last 10 errors. Each error hast a major and minor error number, a valid time stamp or a zeroed time stamp when it is not valid. And the total operating hours of the Fuel Manager.

Example 1 (FM 2 connected)

SFC‹FM

ActivePort 1n P1Cart 1n P1Enable 1n P1Capacity 5l P1Filllevel 50% P2Cart 0n P2Enable 0n P2Capacity 0l P2Filllevel 0% FMDErrMajor 0n FMDErrMinor 0n LevelSensor 1n TFmd 24.6C FMDSysOpTime 262.4644h FMDOpTime 63.0692h

Designation	Description

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PortinUse	The currently port in use of the Fuel Manager. This cartridge will be used up.
P[n]Cart	Cartridge type configured for the Port with number n. See CART for more information.
P[n]Enable	If the Port n will be used by the Fuel Manager or not.
P[n]Capacity	Capacity of the cartridge that is configured on Port n.
P[n]Filllevel	Current fill level of the cartridge on the Port n.
FMDErrMajor	Current Major Error code from the Fuel Manager
FMDErrMinor	Current Minor Error code from the Fuel Manager
LevelSensor	Current status from the Fuel Cartridge Sensor
TFmd	Fuel Manager temperature
FMDSysOpTime	Runtime from the Fuel Manager in hours
FMDOpTimer	Operation time from the Fuel Manager in hours

Example 2 (no FM available)
SFC‹FM

FM 0n

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Command: INFO

SFC›INFO

Description:

Display information about system type, system serial number and firmware version.

Example 1
SFC‹INFO

Type: EFOY 150
Serial: 430200-2025-50508
Firmware: 24.06.161

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Command: LIFE

SFC›LIFE

Description:

Displays the lifetime log database. Lifetime log entries are added automatically in a fixed interval of stack operating time.
This command is for internal use only

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Command: LOG

SFC›LOG

Description:

Display measurement values, system operating information and status. The command has no arguments.

Example 1

SFC‹LOG

POut -0.65W UBat 13.33V UOut 12.74V IOut -0.05A TAmb 23.3C TStack 23.5C THE 23.7C TMeOH 24.4C pDifComp 0.00hPa pAmb 952.86hPa RH 48.8% FL 76.3% MeOHTotal 1.45l DSV 305ul FilltimeTotal 7.48s SysOpTime 1344.6667h StackOpTime 26.5297h SystemStarts 98n StackStarts 19n WOutCum 1807Wh SystemState 0n DmfcState 0n DmfcPhase 0n StackState 0n StackOcvState 4n StackCtrl 0n HTState 0n SystemOn 1n SystemOff 1n SystemOffOk 0n SystemOnOk 1n UserMode 1n BatSoc -1% TStackMin 16.3C TStackMinTime 20201110.172447n TStackMax 74.5C TStackMaxTime 20201019.091004n ActiveErrors 0n Error 0n ErrorMinor 0n ErrorTime 20201019.091004n LastError 1n LastErrorMinor 6n LastErrorTime 20201019.091004n ActiveWarnings 0n Warning 0n WarningMinor 0n WarningTime 20201019.091004n LastWarning 151n LastWarningMinor 1n LastWarningTime 20201019.091004n SystemTime 20201127.140047n

Designation	Description
POut	Output power.
UBat	Battery voltage.
UOut	Output voltage.
IOut	Output current.
TAmb	Ambient temperature.
TStack	Stack temperature.
THE	Heat exchanger temperature.
TMeOH	Methanol temperature.
pDifComp	Compensated differential pressure. The zero point offset is taken into consideration.
pAmb	Ambient pressure.
RH	Relative humidity.

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FL	Fill level of the fluid in the internal system (intermediate tank + tubes).
MeOHTotal	Total methanol consumption.
DSV	Internal value
FilltimeTotal	Internal value
SysOpTime	System operating time (hours the system is connected to a battery)
StackOpTime	Total operation time in charging mode.
SystemStarts	Number of system starts.
StackStarts	Number of stack starts.
WOutCum	Cumulated power emitted by the system.
SystemState	State of the system state machine (0 =off, 1 =standby, 2 = in operation, 3 = shut down, 4 = frost protection, 5 = deep discharge protection, 6 = transport lock procedure, 7 = transport lock, 8 = reset, 9 = factory defaults, 10 = error, 11 = frost protection, 12 = pending, 13 = pending, 14 = update EFOY accessories)
DmfcState	Internal value
DmfcPhase	Operation phase of the DMFC (0 = idle, 1 = start phase, 2 = charging).
StackState	Internal value
StackOcvState	Internal value
StackCtrl	Internal value
HTState	Internal value
SystemOn	Reason the system has turned on: 0: None 1: System has been turned on manually. 2: The system has turned on automatically because the battery required charging. 3: The system has turned on automatically to enter frost protection mode. 4: The system turned on automatically to enter deep discharge protection mode.
SystemOff	Reason the system has turned off: 0: None 1: System has been turned off manually. 2: The system turned off automatically because the battery has been fully charged. 3: The system has turned off automatically because the maximum charge time has been reached. 4: The system has turned off automatically because an overvoltage at the output was detected. 5: The system has turned off because frost protection mode has finished. 6: The system has turned off because the fuel cartridge has depleted. 7: The system has turned off because methanol in reservoir and tubes is depleted for UN3363 requirement. 8: The system has turned off because an error has occurred.

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9: The system was reset.

SystemOffOk	Indicates whether the system may currently be turned off manually (0 = not permitted, 1 = permitted).
SystemOnOk	Indicates whether the system may currently be turned on manually (0 = not permitted, 1 = permitted).
UserMode	System operating mode requested by user. (0 = automatic, 1 = off, automatic by default).
BatSoc	State of charge of the battery. Only available for smart batteries.
TStackMin	Minimum stack temperature.
TStackMinTime	Minimum stack temperature time stamp.
TStackMax	Maximum stack temperature.
TStackMaxTime	Maximum stack temperature time stamp
ActiveErrors	Number of currently active errors
Error	Currently active error (major error code)
ErrorMinor	Currently active error (minor error code)
ErrorTime	RTC date and time (UTC) when the currently active error was set.
LastError	Previously active error (major error code)
LastErrorMinor	Previously active error (minor error code)
LastErrorTime	RTC date and time (UTC) when the previously active error was set.
ActiveWarnings	Number of currently active warnings.
Warning	Currently active warning (major error code)
WarningMinor	Currently active warning (minor error code).
WarningTime	RTC date and time (UTC) when the currently active warning was set.
LastWarning	Previously active warning (major error code).
LastWarningMinor	Previously active warning (minor error code).
LastWarningTime	RTC date and time (UTC) when the previously active warning was set.
SystemTime	System time (UTC) in the format YYYYMMDD.hhmmss.

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Command: MS

SFC›MS ‹DESIGNATION›

Description:

This function is used to configure and display specific information about the EFOY MultiSense accessory device.

Designation	Description
MS	Connection state of the MultiSense. 0 = not connected or not fully initialized, 1 = connected and ready to use.
MSVariant	The MultiSense variant that is connected. 0 = Unknown 1 = MultiSense MS4 2 = MultiSense MS8
MSUSupply	The supply voltage of the MultiSense in V.
MSTxenabled	Temperature sensor x is enabled or disabled.
MSTx	Current value of temperature sensor x in °C (if enabled, otherwise if disabled always 0.0 °C). When Tx is enabled and no sensor is connected the value is -437.0 °C.
MSTxLabel	The current label ID of the temperature sensor x. See label list.
MSAxenabled	Enable status of analog Input x (0 = disabled, 1 = enabled).
MSAxy	Current value of the analog input x, y can be V (Volt), A (Ampere) or W (Watt) depending on AxUnit.
MSAxLabel	The current label ID of analog input x. See label list.
MSAxUnit	The current unit ID of the value of the analog input. See unit list.
MSAxSensor	The currently configured sensor on analog input x. See sensor list.
MSDxenabled[3]	DIO x enabled status (0 = disabled, 1 = enabled). Only available when MSVariant is digital.
MSDxDirection[3]	Currently configured direction of Dx (0 = input or 1 = output). Only available when MSVariant is digital.
MSDxInvert[3]	Inversion status of DIO x (0 = normal or 1 = inverted). Only available when MSVariant is digital.
MSDx[3]	Value of digital port Dx. Only available when MSVariant is digital.
MSDxLabel[3]	The current label ID of digital port Dx. Only Available when MSVariant is digital.
MSDxCurrent	The maximum output current of digital port Dx in mA. This value is ignored for input ports. Only available when MSVariant is digital.
MSDxPowerOn[3]	Value of digital port Dx after power on. Only available when MSVariant is digital.

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MSDxEmcyUsed[3]	Enable state of the emergency feature of the MultiSense. Only available when MSVariant is digital and the port is configured as an output.
MSDxEmcyLevel[3]	Value of digital port Dx after an emergency event. Only available when MSVariant is digital. -1 when emergency feature is disabled.

[3]These arguments are only available when the MultiSense variant with digital ports (MS8) is connected.

At the temperature and analog inputs "x" can be 1 or 2, and at the digital input/outputs "x" can be 1, 2, 3 or 4.

Designation	Description
Tx	Displays temperature of the sensor x in °C.
TxENABLE	Displays if the x is enabled or disabled.
TxENABLE LIST	Displays list of enable options: 0: Disable 1: Enable
TxENABLE [enable]	Enable (1) or disable (0) temperature sensor x.
TxLABEL	Displays the configured label of temperature sensor x.
TxLABEL LIST	Displays a list of available labels for the temperature sensor. 0: Not configured 1: Custom 2: Battery 3: Ambient 4: Outdoor 5: Indoor 6: Cartridge
TxLABEL [number]	Set the label for the temperature sensor x.
TxCONFIGURE	Displays the complete configuration of temperature port x.
TxCONFIGURE LIST	Displays the arguments and possible values of the command.
TxCONFIGURE enable label	Configures temperatue port x in a single step. For parameter details see the Tx... commands above.
Ax	Display current measurement value of the analog input port number x. The unit depends on the configuration.

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AxENABLE	Display whether the analog input port number x is enabled (1) or disabled (0).
AxENABLE LIST	Displays list options for enabling or disabling analog input port x: 0: Disable 1: Enable
AxENABLE [enable]	Enable (1) or disable (0) analog input x.
AxLABEL	Displays the configured label of analog input x.
AxLABEL LIST	Displays a list of available labels for the analog input. 0: Not configured 1: Custom 2: Solar 3: Battery 4: Load 5: EFOY
AxLABEL [number]	Set the label for the analog input.
AxUNIT	Displays the current configured unit of analog input x.
AxUNIT LIST	Displays a list of available units for the analog input. Volt: Directly measured at the analog input. Ampere: Measured voltage is converted to ampere, depending on the configured sensor type. Watt: Power is computed from battery voltage and measured current, depending on the configured sensor type. 0: V 1: A 2: W
AxUNIT [number]	Set the unit for the analog input. Attention! Not all units work with all sensors!
AxSENSOR	Displays the configured sensor.
AxSENSOR LIST	Displays a list of available sensors for the analog input. 0: Custom 1: Current sensor 150A 2: Current sensor 50A 3: Current sensor 10A
AxSENSOR [number]	Set the sensor for the analog input. Attention! The sensor may change the configured unit of the analog input.
AxCONFIGURE	Displays the complete configuration of port x.
AxCONFIGURE LIST	Displays the arguments and possible values of the command.

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AxCONFIGURE enable labe unit [sensor]	Configures analog port x in a single step. For parameter details see the Ax... commands above. The sensor parameter is optional.
IOx[3]	Displays the current state of the digital port x
IOx LIST[3]	Display the possible state options for digital output port x.
IOx [state][3]	Set the state of digital output port x. Possible options are: 0: Off 1: On
IOxENABLE[3]	Displays if digital port x is enable or not.
IOxENABLE LIST[3]	Displays list of enable options: 0: Disable 1: Enable
IOxENABLE [enable][3]	Enable(1) or disable (0) the digital port x.
IOxDIRECTION[3]	Displays the configured direction of x.
IOxDIRECTION LIST[3]	Displays a list of direction: 0: Input 1: Output
IOxDIRECTION [number][3]	Set the direction of digital port x.
IOxINVERT[3]	Displays if the digital port x is inverted.
IOxINVERT LIST[3]	Displays a list of invert options: 0: Normal 1: Inverted
IOxINVERT [number][3]	Set the invert option for digital port x.
IOxLABEL[3]	Displays the configured label of digital port x.
IOxLABEL LIST[3]	Displays a list of available labels for the digital port. 0: Not configured 1: Custom 2: Door 3: EFOY fuel sensor 4: Fan 5: Light 6: Relay
IOxLABEL [number][3]	Set the label for the digital port x.
IOxCURRENT[3]	Displays the maximum output current of port x.
IOxCURRENT LIST[3]	Displays the range vor the maximum output current of port x in mA (0...1000).

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IOxCURRENT [number][3]	Set the maximum output current of port x.
IOxPWRON[3]	Displays the logic level of the port x after power on.
IOxPWRON LIST[3]	Displays a list of possible logic levels of the port after power on. 0: Zero 1: One
IOxPWRON [number][3]	Set the logic level of port x after power on. The electrical state depends on the logic used for the port.
IOxEMCYUSED[3]	Displays the enable state of the emergency feature.
IOxEMCYUSED LIST[3]	Displays list of enable options: 0: Disable 1: Enable
IOxEMCYUSED [enable][3]	Enable(1) or disable (0) the emergency feature. Fails if the port is configured as an input.
IOxEMCYLEVEL[3]	Displays the logic level of the port x after an emergency event, -1 if the emergency feature is disabled.
IOxEMCYLEVEL LIST[3]	Displays a list of possible logic levels of the port after an emergency event. 0: Zero 1: One
IOxEMCYLEVEL [number][3]	Set the logic level of the port x after an emergency event. The electrical state depends on the logic used for the port. Fails if the port is configured as an input or the emergency feature is disabled.
IOxCONFIGURE[3]	Displays the complete configuration of port x.
IOxCONFIGURE LIST[3]	Displays the arguments and possible values of the command.
IOxCONFIGURE enable label direction [invert [current [pwron [EMCYused [EMCYlevel]]]]][3]	Configures digital port x in a single step. For parameter details see the IOx... commands above. If optional parameters are not provided default values will be used (invert: false, current: 1000 mA, pwron: zero, emcy: zero).
INFO	Displays serial number, firmware version and variant
ERROR	Displays the current general MultiSense error and errors for temperature ports, analog ports and DIO ports (only if the connected MSVariant is the digital version) MultiSense Error description: 11.2
FACTORY	User configuration and communication parameters of the MultiSense will be reset to factory settings.
DISABLE	Disable all ports. The port configuration will not be affected by this command.

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DEFAULT	Set user configuration parameters to default values. All ports are disabled, all labels are set to 'Not configured' and the DIO ports are set as input.
RESTART	Reset the MultiSense CAN node.
USUPPLY	Read the supply voltage of the MultiSense.

[3]These arguments are only available when the MultiSense variant with digital ports (MS8) is connected.

IO: All the fields marked with IO are only available when the connected MSVariant is the digital version (EFOY MultiSense MS8).
At the temperature and analog inputs "x" can be 1 or 2, and at the digital input/outputs "x" can be 1, 2, 3 or 4.

Example 1 - output for temperature sub commands (possible port numbers: 1 and 2)
SFC‹ MS T1LABEL LIST

0 – Not configured
1 - Custom
2 - Battery
3 – Ambient
4 - Outdoor
5 - Indoor
6 - Cartridge

Example 2 - output for analog sub commands (possible port number: 1 and 2)
SFC‹ MS A2

-25.0A

Example 3 - output for digital sub commands (possible port numbers: 1, 2, 3 and 4)
SFC‹ MS IO3INVERT LIST

0 - Normal
1 – Inverted

Example 4 - output for error sub command with an MSVariant digital (EFOY MultiSense MS8)
SFC‹ MS ERROR

MSError 000.000n MST1Error 510.001n MST2Error 000.000n MSA1Error 000.000n MSA2Error 000.000n
MSD1Error 000.000n MSD2Error 000.000n MSD3Error 000.000n MSD4Error 000.000n

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Command: RESET

SFC›RESET

Description:

Resets the system. The command has no arguments.

Example 1

SFC›RESET

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Command: REV

SFC›REV

Description:

Displays the firmware revision. The command has no arguments.

Example 1
SFC›REV

Rev 161n

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Command: RTC

SFC›RTC ‹ARGUMENT›

Description:

Display or set the current UTC time. Do not use CET (Central European Time) or CEST (Central European Summer Time)!

Possible transmission parameters:

Argument	Description
	Display current UTC time
[YYYY]-[MM]-[DD] [hh]:[mm]:[ss]	Set current UTC time

Example 1

SFC›RTC
Current time: 2020-12-08T10:18:25Z UTC 617ms

Example 2

SFC›RTC 2020-12-08 10:21:45
Current time: 2020-12-08T10:21:45Z UTC 0ms

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Command: SERIAL

SFC›SERIAL

Description:

Displays the configured system serial number and stack. The command has no arguments.

Example 1

SFC›SERIAL

efoy : 430200-2025-50508
stack: 158010003-44

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Command: TLP

SFC›TLP ‹ARGUMENT›

Description:

Control and monitor the transport protection. The transport protection may only be initiated when the system is in operation, standby or sleep-mode.

The transport protection may only be aborted while it is already active or while the system is still in charging operation. Otherwise the command is rejected.

Possible transmission parameters:

Argument	Description
	Displays the current state of the transport protection procedure state machine 0n = transport lock procedure is inactive 1n = transport lock procedure was aborted manually 2n = transport lock procedure has failed 3n = transport lock procedure has been completed successfully 4n – 7n = transport lock procedure is ongoing
START	Initiate the transport protection while in standby, off or in operation.
ABORT	Abort the active transport protection.

Note: If you want to know whether the transport lock is active, please check the SystemState sh. log command.

Example 1

SFC›TLP
TLPState 0n

Example 2

SFC›TLP START
Ok

Example 3

SFC›TLP
TLPState 4n

Example 4

SFC›TLP ABORT
Ok

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Command: UNLOCK

SFC›UNLOCK

Description:

Deactivate the transport protection mode. The command is rejected when the system is not in transport protection mode.

Example 1

SFC‹UNLOCK
OK

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Command: VER

SFC›VER

Description:

Displays the firmware version. The command has no arguments.

Example 1

SFC›VER

Firmware EFOY 150 24.06C12V/24V QB date 2020-11-06

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Command: WARNING

SFC›WARNING ‹ARGUMENT›

Description:

List the codes and UTC timestamps of last warnings that occurred.

Possible transmission parameters:

Argument	Description
	Without an argument the last 10 warning log entries or all available warning log entries, if there are less than ten, are displayed.
number, e.g. 20	Display the desired number of the warning log entries. If there are less than the specified warning log entries, only the available entries are shown.

Example 1

SFC›WARNING

Code	Timestamp	StackOpTime
195.001	2020-11-23T13:17:31Z	25h
195.001	2020-11-23T13:17:23Z	25h
195.001	2020-11-23T10:45:58Z	25h
195.001	2020-11-23T10:44:25Z	25h
195.001	2020-11-23T10:41:28Z	25h

Example 2

SFC›WARNING 3

Code	Timestamp	StackOpTime
195.001	2020-11-23T13:17:31Z	25h
195.001	2020-11-23T13:17:23Z	25h
195.001	2020-11-23T10:45:58Z	25h

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