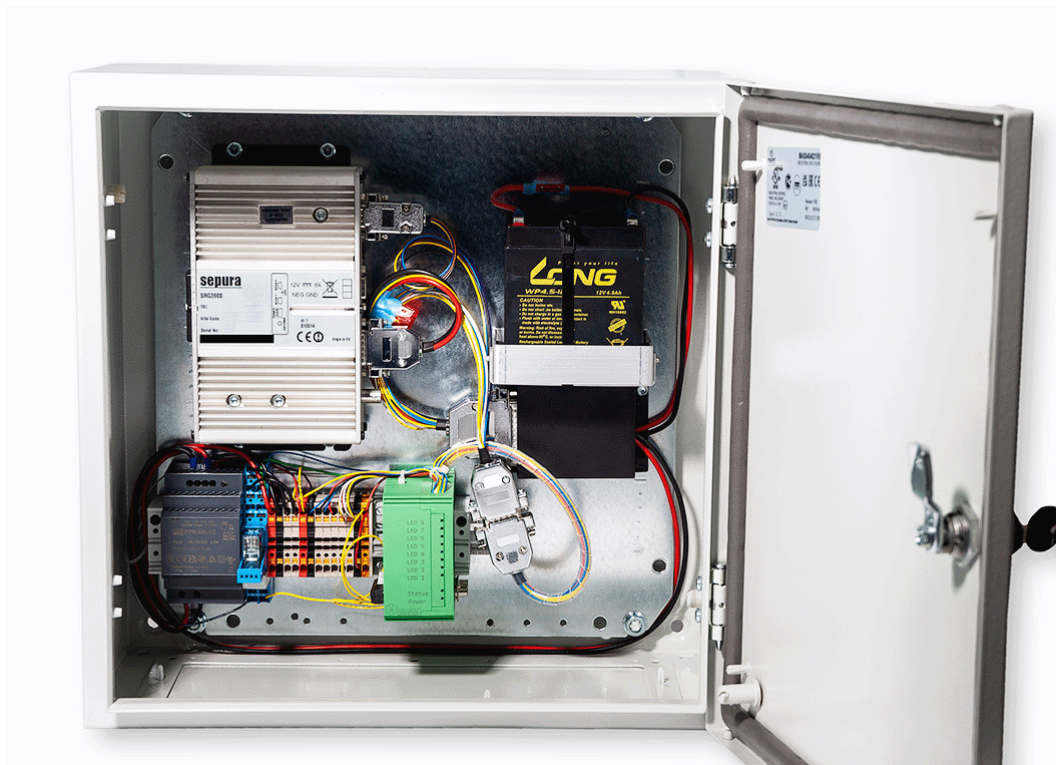


TETRA Siren Unit

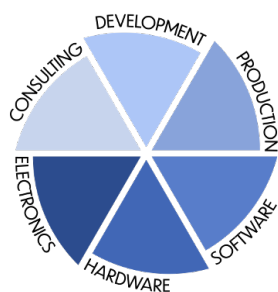
TETRA FX1

GPIO-Interface for Digital Radios

Manual



(Image similar)



FunkTronic
Radio Control Systems & more

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1. Order Information

| FT code | Description |
|---------|--|
| 542100 | TETRA Siren Unit TETRA FX1, for 100-240V AC Line Voltage |
| 542200 | TETRA Siren Unit TETRA FX1, for 24V DC Connection (figure on title page similar) (The radio-specific connection cable with power supply and data connection is included in the scope of delivery. Please specify the radio type to be used: MTM800 FuG ET / SRG3900 / SCG22) |
| 542000 | TETRA FX1 logic board in DIN rail housing, incl. relay board (figure below similar) |
| 542001 | TETRA FX1 logic board in DIN rail housing, without relay board |



2. TETRA FX1

TETRA FX1 designates the central logic board of the FunkTronic TETRA siren control receiver and as such is also available individually in the practical green housing for DIN rail mounting.

It offers the following functions as standard:

- evaluation of SDS-TL callout alerts via GSSI + sub-address (incl. support for mSDS)
- up to 128 combinations of alarmable sub-addresses with associated GSSI
- up to 74 ISSIs authenticated for alerting (with choice normal/BBK)
- status feedback as callout info PDU or normal status SDS
- configurable min. and max. delay time of random delayed SDS statuses
- up to 8 configurable target SDSs as status receivers
- pre-programmed siren sequences for fire, disaster warning, all-clear, short/long test
- maximum 10 slots for siren sequences
- configurable blocking time between siren sequences
- management of a total of up to 100 different input functions
- management of a total of up to 100 different output functions
- 8 configurable inputs (1 input to ground by default, 7 inputs floating)
- 6 configurable relay outputs (designed to be expandable in case of future needs)
- status display via 10 LEDs (power, status and I/O 1-8)

Notes on configuration with the associated programming software can be found in the corresponding chapter 4.Configuration Software Prog_TETRAFX1.

2.1. Description of LEDs

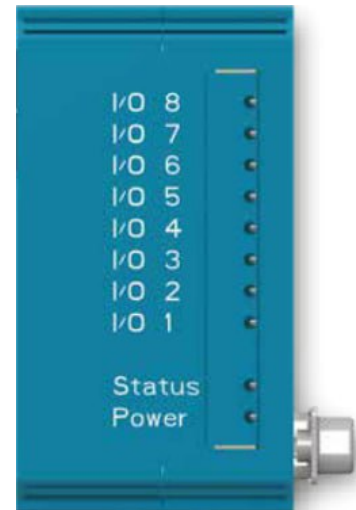
The LED bar display provides the following information:

- **Power LED:** Status indication

flashes green: status OK

flashes red: active error status
(exact status can be read from LEDs 1-8)

Yellow flashing is reserved for warnings, but not implemented yet.



- **Status LED:** Displays connection status of the digital radio

LED off: no data connection

LED yellow: Response received, but SIM not yet recognized (SIM error)

LED blue: not logged into TMO network

LED green: OK

- **I/O LEDs 1-8:** Depending on the color of the LEDs, the following states are displayed:

RED Error

- 1: TETRAFX1 error (temperature sensor defective or EEPROM error)
- 2: Readback/connection error (to other hardware modules)
- 3: Readback error siren control output
- 4: Battery error (battery not recognized or charging error)
- 5: Power supply error (AC) or missing input voltage (DC version)

YELLOW Warning

- 1: Temperature outside the specified range
(Range can be configured, ex works: error for $T > 55\text{ °C}$)
- 2: Battery is below the minimum voltage
- 3: Low battery capacity (currently not implemented)

GREEN Status

- 1: Siren output active
- 2: Siren sequence aktiv (includes subsequent blocking time)
- 3: Battery is recharging
- 4: Battery partial discharge active (currently not implemented)

BLAU Input 1-8 is active

VIOLETT Output (Relay) 1-6 is active

The I/O LEDs change their display cyclically. Status changes are displayed prioritized. More comfortable and more precise information about errors, warnings and status can be viewed via the infotext page of our programming software Prog_TETRAFX1, e.g. for further differentiation of a reported error. (4.3 Infotext)

3. TETRA Siren Control Unit

The standard version of the TETRA Siren Unit (TSE) consists of the following components:

- central logic unit TETRA FX1 in green DIN rail housing (see 2.TETRA FX1) with various interfaces and logical inputs and outputs (GPIOs)
- Power board for voltage monitoring, internal power supply and regulated battery charging
- Output for siren relay
- dedicated system inputs for voltage monitoring, door contact, siren relay readback, temperature sensor (internal or external via one of the freely selectable inputs)
- in the standard version: 5 additional potential-free inputs, e.g. for analog remote control receiver, manual fire alarm, etc.
- finished cabling of the system components TETRA FX1, power board, battery, door contact as well as voltage supply and monitoring
- radio specific connection cable whip

The TETRA siren control receiver is supplied pre-assembled in the control cabinet. The control cabinet is equipped with a locking system and the underside of the control cabinet can be secured against external access on request.

For easy preparation for the final type of use, the internal mounting plate with all prepared superstructures can simply be removed and reinserted later. Since the location and type of feedthroughs used for the antenna connection vary depending on the installation type, we do not provide them in advance per se. Please let us know if you have recurring requirements for the feedthrough type that could be prepared more efficiently by us.

Please also consult our enclosed installation instructions for a description of the internal connections, wiring and mounting holes.

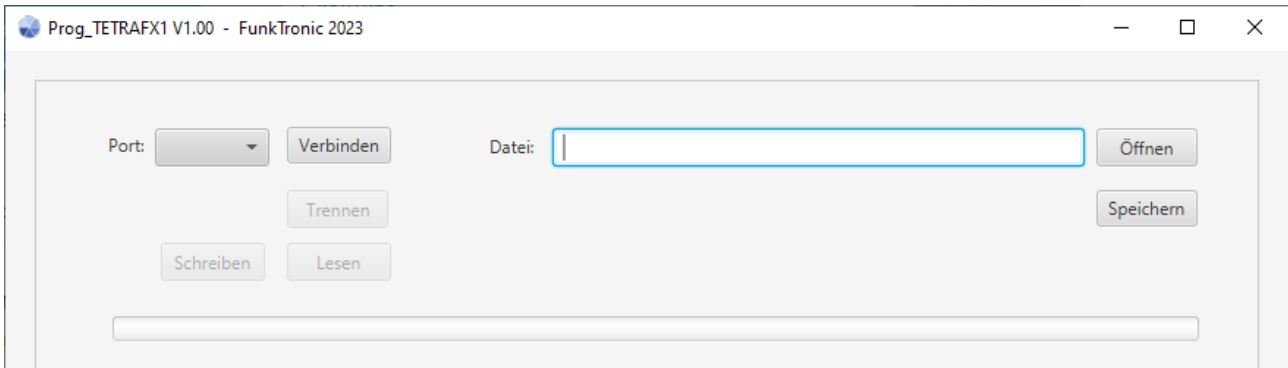
3.1. Technical Data (TSE in control cabinet)

| | |
|---|---|
| External power supply: | 230V AC or 24V/12V DC |
| Built in power supply (230V): | 12V 5A (60W) |
| Battery capacity installed as standard: | 12V / 4,5 Ah (ca. 90x70x101 mm) |
| Power consumption (w/o radio): | approx. 80-100 mA |
| Battery operating time (to MRT shutdown): | approx. 8-12h at standard temperature |
| Outputs (Logic module TETRA FX1): | 6x potential-free 3-contact changeover relays (loadable up to 3A/24VDC) |
| Siren relay (pre-wired in TSE): | 1x potential-free normally open contact (loadable up to 8A) |
| Inputs (Logic module TETRA FX1): | potential free, activatable with 5-30VDC Input current: 0.5-1.5 mA (Exception: Input 8 can be activated to GND) |
| Inputs pre-wired in TSE: | Input 6: Read-back contact siren relay Input 7: Power supply output "Voltage OK" Input 8: Door contact |
| Inputs 1-5 are connected to +12V on one side in the delivery state, so that they can be activated to GND. | |
| Dimensions: | approx. 400x400x210 mm |
| Protection class: | IP66 (For installation according to control cabinet manufacturer) |

When assembling/installing the control cabinet, you are obliged to pay attention to the specifications of the respective control cabinet manufacturer.

4. Configuration Software Prog_TETRAFX1

The configuration of the TETRA siren unit or the TETRA FX1 logic board is performed using our Prog_TETRAFX1 configuration software. For connection to the logic board, an externally accessible COM interface is available, which can be accessed from all PCs using a commercially available USB COM converter.



Select the desired COM port and connect to it. You can read out and display the current configuration via the "Read" button. After making changes, you can upload the new status again via the "Write" button. The logic board then starts with the newly selected parameters.

Furthermore, the selected configuration can be saved as a file for later use via the "Save" button and reloaded via "Open".

4.1. Configurations

The actual configuration is done using the different tabs at the bottom of the window. The available tabs for settings are as follows:

a) Sub-Adresses

Allows the definition of up to 128 combinations of GSSI + sub-addresses to which the TETRA FX1 should respond. The sub-addresses can be displayed and entered in either decimal or hexadecimal format. Each sub-address can be assigned to one of 32 logical TETRA inputs, which can then be used to trigger the various functions. Furthermore, the max. random delay time for each GSSI/sub combination can be set here.

b) ISSIs

Here you can define up to 74 ISSIs that are authorized to trigger functions of this siren control. For each ISSI, you can freely define whether it is an ISSI of the BBK.

c) Status Values

For the status values to be sent, you can define here whether this is to be done as a callout info PDU or as a normal status. Since the desired behavior is defined in the usage concept, no changes should be necessary at this point for the time being.

d) Status Target ISSIs

The ISSIs stored here receive the technical status messages of the TETRA FX1 such as sabotage alarm (door contact), mains voltage drop, overtemperature, etc.

e) Input Functions

In this tab you can assign the triggerable functions to up to 100 different logical and physical inputs.

f) Output Functions

Define here the criteria based on which the physical outputs are to be switched.

g) Siren Sequences

Here you can select up to 10 different siren sequences. The following siren sequences are currently stored:

- Fire (3x 12sec. impulse, interrupted by 2x 12sec. pause)
- Disaster alarm/warning (60 sec. alternation between 2 sec. on/off, "wailing sound")
- All-clear signal (60-second continuous tone)
- short test (4,8s on signal)
- long test (12s on signal)

h) General (Allgemeines)

Via General, a few general settings can be changed, e.g. for alarm disable times and various delay times.

4.2. Examples for Siren Control via GSSI/Sub

| Subadressen | | | | | | | | | | | | ISSIs | Statuswerte | Statusziel-ISSIs | Eingangsfunktionen | Ausgangsfunktionen | Sirenensequenzen | Allgemeines | Konsole |
|-------------|---------------------|-------|-------|----------|----------------------|-------|-----------------------|-------|--------|---------|---------|---------|-------------|------------------|--------------------|--------------------|------------------|-------------|---------|
| 1 - 10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | 101-110 | 111-120 | 121-128 | | | | | | | |
| GSSIs | Subadressen Dezimal | | | Funktion | | | max. Alarmverzögerung | | | | | | | | | | | | |
| 001: | 1234567 | 10100 | | | TETRA-Eingang setzen | 1 | aktiv an | 20 s | | | | | | | | | | | |
| 002: | 1234567 | 20100 | | | TETRA-Eingang setzen | 2 | aktiv an | 20 s | | | | | | | | | | | |
| 003: | 1234567 | 30100 | | | TETRA-Eingang setzen | 3 | aktiv an | 20 s | | | | | | | | | | | |
| 004: | 2345678 | 41111 | | | TETRA-Eingang setzen | 4 | an | 0 s | | | | | | | | | | | |
| 005: | 2345678 | 41112 | | | TETRA-Eingang setzen | 4 | aus | 0 s | | | | | | | | | | | |

In the Sub-addresses tab, the combinations of group SSI and sub-address to be analyzed are stored and linked to a logical TETRA input. The option "active on" means that this logical input is always reset on receipt. For each sub-address, the desired random delay time can also be entered here.

Each logical input can be assigned a specific siren sequence via "Input functions".

| Subadressen | | | | | | | | | | | | ISSIs | Statuswerte | Statusziel-ISSIs | Eingangsfunktionen | Ausgangsfunktionen | Sirenensequenzen | Allgemeines | Konsole |
|-------------|---------------------------------|-------|-------|-----------|-------|--------|-------|--------------------------|--------|--|--|-------|-------------|------------------|--------------------|--------------------|------------------|-------------|---------|
| 1 - 10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 | | | | | | | | | | |
| 001: | Softwareeingangsplatine 1 TETRA | | | Eingang 1 | 0 > 1 | Sirene | 0 | Ablauf nach MLV (Bayern) | | | | | | | | | | | |
| 002: | Softwareeingangsplatine 1 TETRA | | | Eingang 2 | 0 > 1 | Sirene | 1 | Ablauf nach MLV (Bayern) | | | | | | | | | | | |
| 003: | Softwareeingangsplatine 1 TETRA | | | Eingang 3 | 0 > 1 | Sirene | 2 | Ablauf nach MLV (Bayern) | | | | | | | | | | | |
| 004: | Keine Funktion | | | | | | | | | | | | | | | | | | |
| 005: | Keine Funktion | | | | | | | | | | | | | | | | | | |
| 006: | Interne Eingangsplatine | | | Eingang 1 | 0 > 1 | Sirene | 0 | Ablauf nach MLV (Bayern) | | | | | | | | | | | |
| 007: | Interne Eingangsplatine | | | Eingang 2 | 0 > 1 | Sirene | 5 | Ablauf nach MLV (Bayern) | | | | | | | | | | | |

In the same way, physical inputs can also be assigned the corresponding functions, as can be seen in lines 6+7.

In the "Output functions" tab, we have linked the logical TETRA input no. 4, which can be controlled via Callout, to a physical relay output as an example (e.g. to operate a gate/door control or similar):

| Subadressen | ISSIs | Statuswerte | Statusziel-ISSIs | Eingangsfunktionen | Ausgangsfunktionen | Sirenensequenzen | Allgemeines | Konsole | |
|-------------|-----------------------|-------------|--------------------------|-----------------------|--------------------|------------------|-------------|---------|--------|
| 1 - 10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 |
| 001: | Interne Relaisplatine | Relais 1 | Virtueller Eingang TETRA | an, wenn Quelle aktiv | Platine 1 | Eingangsnr 4 | | | |
| 002: | keine Funktion | | | | | | | | |

4.3. Infotext

If the configuration software Prog_TETRAFX1 is connected to the logic board via the 9pol. COM port, current status information is displayed in the "Info texts" tab.

The screenshot shows the 'Infotexte' tab of the configuration software. The interface is divided into two main sections. The left section displays general system information:

- Boardtemperatur: + 25 Grad
- Vin: 14,44V Vakku: 13,31V
- Hersteller: FunkTronic GmbH
- Hardware: TETRAFX
- Software: TETRAFX
- Version: V1.02
- Datum: 23.03.23
- System-Flags - Error:00780000 - Warn:00000000 - Stat:00000004
- Stat |ACCULoad
- Inputs:00000040 - Outputs:00000000
- Eig. ISSI: HE.....DIENSTLEISTER.12
- Gew. GSSI: (Heimnetz)
- MRT-Hersteller: SEPURA
- MRT-Hardware: SRG3900
- MRT-Software:
- MRT-Seriennr.:
- LAC00: 8857 -78dBm verbunden

The right section displays a list of detected TETRA cells:

- LAC01: 8886 -81dBm
- Frq01: 393,6375MHz -81dBm
- Frq02: 394,8875MHz -115dBm
- Frq03: 394,1375MHz -108dBm
- Frq04: 391,6375MHz -108dBm
- Frq05: 391,7875MHz -109dBm
- Frq06: 392,5875MHz -111dBm
- Frq07: 393,4375MHz -111dBm
- Frq08: 391,5375MHz -112dBm
- Frq09: 392,7125MHz -113dBm
- Frq10: 393,5625MHz -113dBm
- Frq11: 390,5875MHz -114dBm
- Frq12: 393,9875MHz -115dBm
- Frq13: 392,2125MHz -115dBm
- Frq14: 391,7625MHz -115dBm
- Frq15: 392,6875MHz -115dBm
- Frq16: 393,3625MHz -116dBm

In addition to the board temperature, the input voltage of the power supply or DC/DC converter and the battery, the firmware version of the TETRA FX1 can always be seen here. The dot bar to the right of the manufacturer's name shows how the display is updated cyclically.

Next come the system flags, which are not very meaningful at first. Specific relevant states (error, warning or status) are displayed as short text in the line below, here in the example the battery is being charged. Also a further output gives information about switched outputs or recognized inputs. If you need help, please always send us the content of this tab, either as a screenshot or by selecting and copying.

When a radio is tethered and detected, the following provides more information:

- ISSI (+OPTA) of the inserted SIM card
- the primary group selected by the radio
- Data on hardware, software and TEI or serial number of the radio
- Overview of the TETRA cells detected by the radio (on the MTM800 FuG ET, the cell numbers are always displayed instead of frequencies as in this example)

5. Prerequisites of the TETRA Radio

To ensure smooth operation, a few parameters must be observed in the programming of the digital radios and, if necessary, adjusted by the responsible departments. These parameters, which are most important for the connection of the **TETRA FX1**, are listed below for **Sepura SRG3900/SCG2229** and **Motorola MTM800 FuG ET**.

5.1. Configuration Sepura SRG3900/SCG2229

Parameter 8150:

(Profile >> PEI parameters >> General PEI parameters >> parameters)

"Standard Hayes Baudrate" to "38400"

5.2. Configuration Motorola MTM800 FuG ET

Funktionsflags

- "External Device": Must be activated!

Datendienste >> PEI-Parameter

- "Baud rate": 38400

6. Release Notes

- 2023-03-27 - first English version by translation of German version
- 2023-03-29 - minor changes