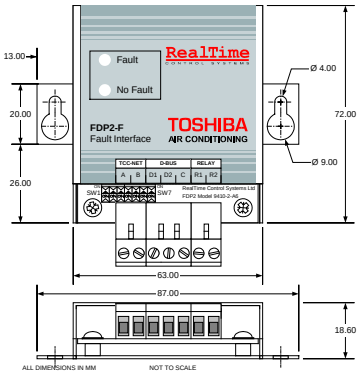
RBC-FDP2-F-PE Interface

Installation and Operating Instructions



FDP2 Description

The FDP2-F is a monitoring and control interface for the Toshiba Digital Inverter, SHRM and SMMS range of air-conditioners.

Fault Reporting

The FDP2-F Interface detects all indoor and outdoor faults occurring in TCC-NET compatible Toshiba air-conditioners and reports them by closing relay contacts R1-R2. The FDP2-F is connected on the TCC-NET network with or without a standard remote controller and detects any faults that can be displayed on the controller for up to 8 units. Red and Green LEDs Indicate Fault/No Fault state.

Control Functions

GROUP CONTROL. Multiple FDP2 Interfaces can be connected to form large groups of units controlled from a single remote controller.

OPERATION PRESETS. Remote controller operation can be locked and various different preset run conditions can be sent from the FDP2.

DUTY/STANDBY. Pairs of FDPs can operate duty/standby control with 24 hour alternating duty, and changeover on fault.

HARDWIRED CONTROL. In conjuntion with an FDP2-BMS unit control can be achieved through potentiometer and volt-free contact inputs as well as via BMS integration.

CUSTOM CONTROL. FDP2 interfaces can be supplied in custom configurations to suit specific applications.

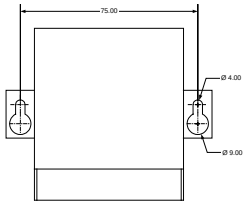
Warnings and Cautions

Do not exceed the specified fault relay ratings

Mounting

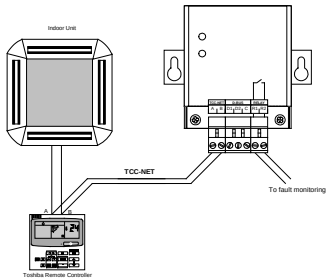
The FDP2 should be mounted using the keyhole mounting points as indicated in the adjacent diagram.

The FDP can be mounted horizontally or vertically.



Basic Cable Installation

Cabling should be a minimum 0.75mm^2 throughout. Terminals TCC-NET A/B connect to the Toshiba TCC-NET. TCC-NET installation should follow Toshiba installation specifications. Terminals R1-R2 connect to fault monitoring or indication equipment according to the specified rating of the relay. The FDP2 is powered from the TCC-NET and requires no extra power supply.



LED Functionality

Key: OFF, FLASHING, ON

Normal Operation

R ○ G ☼	Power-Up sequence Factory Configuration
R ☼ G ☼	Power-Up sequence Custom Configuration
R ○ G ☼	TCC-NET Holdoff. After power-up and during unit configuration

R ○ G ☼	No Fault State
R ☼ G ○	Unit Fault

Error Conditions

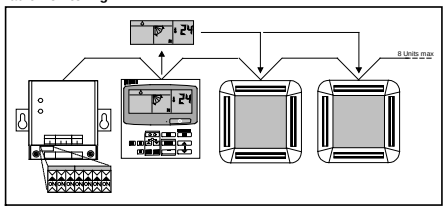
R ☼ ○ ☼ ○ ☼ ○ ☼ G ○ ☼ ○ ☼ ○ ☼	Device configuration error
R ☼ ○ ○ ☼ ○ ○ ☼ G ○ ○ ☼ ○ ○ ☼	No unit master found on TCC-Net
R ☼ ○ ☼ ○ ☼ ○ ☼ G ○ ☼ ○ ☼ ○ ☼	D-BUS Communications timeout
R ☼ G ○	Duplicate D-BUS Address detected

Standard Operation

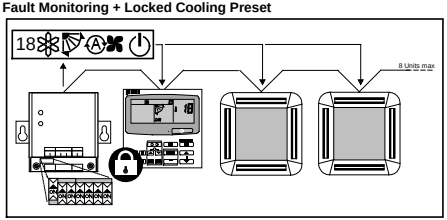
FDP2 Configuration Switches

The FDP2 has a number of standard configurations that can be set using switches SW1 to SW7 shown above. Factory configuration is configured with all switches OFF. In this mode the FDP2 operates as a standard fault monitoring device. Additional preset modes are available using SW1 and SW2 to operate the system in preset Heat, Cool and Auto modes*.

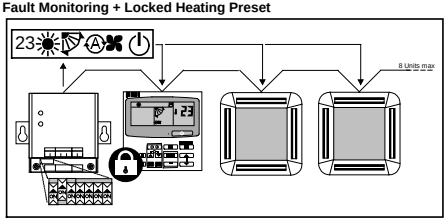
Fault Monitoring



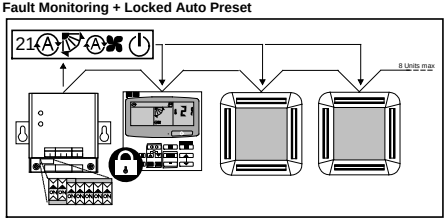
Fault Monitoring + Locked Cooling Preset



Fault Monitoring + Locked Heating Preset



Fault Monitoring + Locked Auto Preset

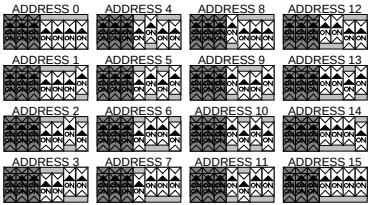


*Units that do not support specific modes such as cooling-only units will operate in fan-only in unsupported modes.

FDP2 Advanced Operation

ADDRESSING

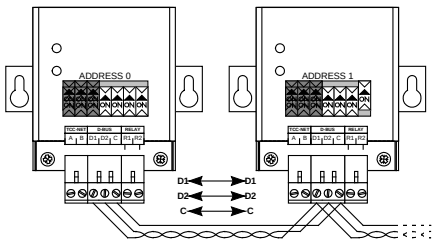
The FDP2 has the facility to create control groups using multiple FDP2s connected together on the D-Bus network. In standard configuration up to 16 FDP2 devices can be connected together. Each FDP2 is assigned a D-Bus address using the configuration switches SW4 to SW7. Unit addresses are shown below.



Address 0 is the FDP2 MASTER address. Address 1 to 15 are FDP2 SLAVE addresses that can be used to create large control groups.

NETWORK INSTALLATION

The D-Bus network requires a twisted pair cable connecting terminals D1 and D2 on each FDP2 as shown below. Terminal D1 must be connected to all other D1 terminals. Terminal D2 must be connected to all other D2 terminals. In addition the common terminal C on all devices must be connected together. If a shielded cable is used then the shield can be used for this purpose. The network must be installed as a point to point BUS configuration, Star and Ring connections must NOT be used.



SPECIFICATION

Use solid or stranded 24awg shielded or unshielded twisted pair to Cat3, Cat4 or Cat5 specification. Use a twisted pair for connections D1,D2 and an extra core for connection C.

NETWORK LENGTH

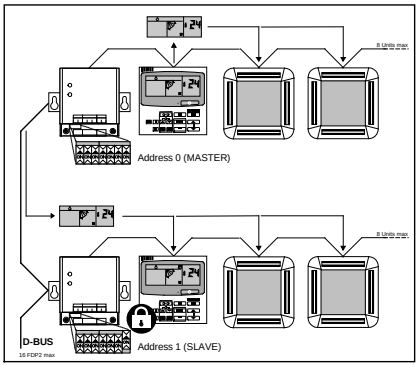
Standard installation for total network distances of up to 500m can be achieved following the basic daisy-chaining method showed in the above diagram. Network layout should follow a point-to-point connection, 'T' and star connections are not supported,

FDP2 Group Control

Group control allows up to 16 FDP2s to be connected on a D-Bus local network. Each FDP2 reports faults for the locally attached units. The FDP2 with address 0 is a MASTER and determines the settings for all systems connected to FDP2s addressed as slaves. The operating mode of the master is determined by SW1, SW2 as shown in the Standard Operation configuration instructions overleaf.

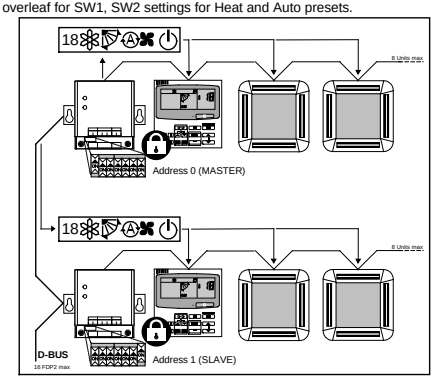
LOCAL CONTROL

With SW1 OFF and SW2 OFF the MASTER FDP2 system operates under the control of the attached remote controller. SLAVE FDP2 devices will duplicate these settings to allow large groups to be controlled from one remote controller. Remote controllers on the slave FDP2s are locked and can be omitted if desired.



PRESET CONTROL

If the master is configured for Heat, Cool or Auto preset control then the FDP2 slave units will operate to the same settings as the master. The diagram below shows the system configured for the Cool preset. See overleaf for SW1, SW2 settings for Heat and Auto presets.

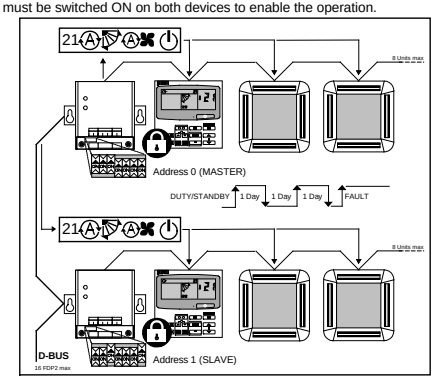


FDP2 Duty/Standby Operation

SW3 ON for Duty/standby

Duty/Standby will alternately run two systems on 24 hour alternating run/standby. If a fault occurs on either system then both systems are switched on until the fault is cleared.

Duty/Standby is achieved using two FDP2 devices, one with Address 0 and one with Address 1 with a D-BUS connection between the two. SW3 must be switched ON on both devices to enable the operation.



The MASTER FDP2 can be configured using SW1 and SW2 to operate using one of the three preset modes Heat, Cool or Auto. Alternatively the MASTER can be configured for local control, in which case the remote controller attached to the MASTER FDP2 can be used to set the operating settings during master duty.

Advanced control

More sophisticated control con be achieved using the FDP2-BMS interface, this provides a number of inputs that allow external control of unit operation, or connection to Building Management Systems. The FDP2 interfaces can also be customised for specific operating requirements. Contact Toshiba for details.

Functional Specification

Electrical		**Environmental**	
Supply	18V DC from TCC-NET	**Temperature**	
		Storage	-10oC to 50oC
Power	<1VA	**Operation**	0oC to 50oC
Relay	1A, 24VAC max 1A, 30VDC max	**Humidity**	0-90% RH non-condensing
Mechanical		**Protection**	IP30
Dimensions (mm)	H72 x W87 x D19	**EMC Emissions**	EN61000-6-1
Mounting	Two keyhole mounting flanges	**EMC Immunity**	EN61000-6-3
Casing	Zinc coated mild steel		
Weight	80g		
Connectors	Rising clamp to 0.75mm^2 cable		