WHAT IS CLAIMED IS:

1. A control system of an edge device, comprising an edge system and a cloud server, wherein the edge system comprises an industrial touch screen terminal, an input/output (I/O) module, and a frequency converter; the industrial touch screen terminal is separately interconnected with the I/O module and the frequency converter; a front end of the industrial touch screen terminal is separately connected to a variable refrigerant volume (VRV) air conditioning system and a fan coil unit (FCU), and a rear end of the industrial touch screen terminal is separately connected to the cloud server and a monitoring device; the industrial touch screen terminal is separately connected to a water valve and a water leakage alarm sensor of an air handling unit (AHU) by means of the I/O module; the industrial touch screen terminal is connected to the AHU by means of the frequency converter; and a rear end of the cloud server is connected with a management control terminal,

wherein the cloud server comprises a logic processing unit, the logic processing unit comprises a pre-trained neural network model, and an algorithm of the pre-trained neural network model is as follows:

a, defining a state space and an action space, wherein the state space defines a possible state; and the action space defines an adoptable action;

b, initializing a Q function, wherein for all state-action pairs (s, a), Q (s, a) is initialized as an any value, and an initial value is random or set according to priori knowledge;

c, defining a reward function, wherein a reward function R(s, a, s') is designed according to a concrete problem, which describes an instant reward obtained when a state s transitions to a state s' after an action a is performed; the design of the reward function needs to take an objective of the problem into account to stimulate an agent to progress toward a desired behavior; otherwise, a negative reward is given;

d, performing Q-learning cyclical iteration;

e, selecting an action, wherein the action a is selected using a certain strategy according to the current state s; a common strategy is ε-greedy strategy; a random action is selected at a certain probability ε, and an action currently having a maximum Q value is selected at a probability of 1-ε;

f, performing the action and observing a reward and next state, wherein the selected action a is performed to interact with an environment, and the reward r and next state s' are observed;

g, updating the Q function, wherein a Q value is updated using an updating formula of the Q

function: $Q(s, a) \leftarrow Q(s, a) + \alpha [r + \gamma \max_{a'} Q(s', a') - Q(s, a)]$, wherein α is a learning rate and $0 \leqslant \alpha \leqslant 1$, and γ is a discount factor for balancing significances of a current reward and a future reward, and $0 \leqslant \gamma \leqslant 1$;

h, updating the state to next state: $s \leftarrow s'$; and

i, repeating the above steps until the Q function converges, and saving a data structure of the pre-trained Q function as a binary file for subsequent loading and use.

2. The control system of the edge device according to claim 1, wherein the industrial touch screen terminal comprises a logic control unit, an interface interaction unit, a network communication unit, a buffer unit, a hardware data acquisition unit, a database unit, and an operation monitoring unit; the logic control unit is separately interconnected with the interface interaction unit, the network communication unit, the buffer unit, the database unit, and the operation monitoring unit; the hardware data acquisition unit is interconnected with the buffer unit; a front end of the hardware data acquisition unit is separately connected to the VRV air conditioning system, the FCU, and the monitoring device; and the network communication unit is connected with the cloud server for intercommunication.

3. The control system of the edge device according to claim 1, wherein the cloud server further comprises a message queuing telemetry transport (MQTT) gateway unit, a Web service gateway unit, and a cloud database unit; the logic processing unit is separately interconnected with the MQTT gateway unit, the Web service gateway unit, and the cloud database unit; the logic processing unit is connected with the edge system by means of the MQTT gateway unit for intercommunication; and the logic processing unit is connected with the management control terminal by means of the Web service gateway unit for intercommunication.

4. The control system of the edge device according to claim 1, wherein the monitoring device comprises an electric meter, an air quality detection apparatus, an FCU control panel, a VRV air conditioning control system control board, a frequency converter, a proportional integral electric valve, a temperature sensor, a fresh air flow meter, a water flow meter, an electric air valve, a water leakage alarm sensor, and a liquid level sensor.

5. The control system of the edge device according to claim 1, wherein the management control

terminal comprises a mobile phone, a pad, and a computer.

6. A control method of a control system of an edge device, comprising the following steps:

step 1, connecting an industrial touch screen terminal of an edge system with a variable refrigerant volume (VRV) air conditioning system, a fan coil unit (FCU), and a monitoring device, and acquiring and storing data;

step 2, connecting the industrial touch screen terminal of the edge system with a water valve of an air handling unit (AHU) by means of an input/output (I/O) module, and controlling the water valve to achieve an effect of controlling a water flow; connecting the industrial touch screen terminal of the edge system with a water leakage alarm sensor of the AHU by means of the I/O module, and obtaining a water leakage alarm signal feedback when a water level in a water tray rises; and connecting the industrial touch screen terminal of the edge system with the AHU by means of a frequency converter, and controlling a blower power of the AHU;

step 3, in normal operation, dynamically regulating the water valve and the frequency converter by the industrial touch screen terminal of the edge system according to an environmental temperature and a set temperature of the AHU, thereby realizing temperature control and energy saving; and when a water leakage alarm is triggered, fully closing the water valve by the industrial touch screen terminal of the edge system, avoiding causing a relatively great loss;

step 4, packing locally acquired data by the industrial touch screen terminal of the edge system, uploading the data to a cloud server, and executing a remote control instruction obtained from the cloud server;

step 5, performing troubleshooting and data analysis using historical operating data stored on the cloud server; and

step 6, monitoring or controlling, by an administrator using a management control terminal and via the cloud server, the industrial touch screen terminal of the edge system such that the edge system operates according to a remote instruction,

wherein the cloud server comprises a logic processing unit, the logic processing unit comprises a pre-trained neural network model, and an algorithm of the pre-trained neural network model is as follows:

a, defining a state space and an action space, wherein the state space defines a possible state; and the action space defines an adoptable action;

b, initializing a Q function, wherein for all state-action pairs (s, a), Q (s, a) is initialized as an any

value, and an initial value is random or set according to priori knowledge;

c, defining a reward function, wherein a reward function R(s, a, s') is designed according to a concrete problem, which describes an instant reward obtained when a state s transitions to a state s' after an action a is performed; the design of the reward function needs to take an objective of the problem into account to stimulate an agent to progress toward a desired behavior; otherwise, a negative reward is given;

d, performing Q-learning cyclical iteration;

e, selecting an action, wherein the action a is selected using a certain strategy according to the current state s; a common strategy is ε-greedy strategy; a random action is selected at a certain probability ε, and an action currently having a maximum Q value is selected at a probability of 1-ε;

f, performing the action and observing a reward and next state, wherein the selected action a is performed to interact with an environment, and the reward r and next state s' are observed;

g, updating the Q function, wherein a Q value is updated using an updating formula of the Q function: $Q(s, a) \leftarrow Q(s, a) + \alpha [r + \gamma \max_{a'} Q(s', a') - Q(s, a)]$, wherein α is a learning rate and $0 \leqslant \alpha \leqslant 1$, and γ is a discount factor for balancing significances of a current reward and a future reward, and $0 \leqslant \gamma \leqslant 1$;

h, updating the state to next state: $s \leftarrow s'$; and

i, repeating the above steps until the Q function converges, and saving a data structure of the pre-trained Q function as a binary file for subsequent loading and use.

7. The control method of the control system of the edge device according to claim 6, wherein a working process of the industrial touch screen terminal comprises the following steps:

step 1, acquiring and storing, by a hardware data acquisition unit, data in a buffer unit, extracting, by a logic control unit, data from the buffer unit, and processing various types of data information;

step 2, storing, by the logic control unit, data that needs to be stored in a database unit;

step 3, transferring, by the logic control unit, structured data to an interface interaction unit for displaying;

step 4, transferring, by the logic control unit and via a network communication unit, data that needs to be transmitted to the cloud server to the cloud server; and

step 5, writing, by the logic control unit, a control instruction in the buffer unit, and fetching and dispatching, by the hardware data acquisition unit, an instruction to a corresponding hardware device.

8. The control method of the control system of the edge device according to claim 6, wherein a working process of the cloud server comprises the following steps:

step 1, receiving, by a message queuing telemetry transport (MQTT) gateway unit, hardware related data pushed by the edge system, and receiving, by a Web service gateway unit, a related request from the management control terminal;

step 2, processing, by the logic processing unit, hardware data pushed by the edge system, and determining whether alarm information needing to be sent or other service logic needing to be operated;

step 3, processing, by the logic processing unit, a request from the management control terminal, and responding correspondingly; and

step 4, storing or updating the data processed by the logic processing unit and data generated by the logic processing unit to a cloud database unit.